MARKETING ACTIVITY, THE LEVEL OF INCOME, AND THE RATE OF GROWTH: A THEORETICAL AND EMPIRICAL ANALYSIS OF SELLING EFFORT AND ITS IMPACT ON THE MACRO ECONOMY

by

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ROCKY MOHAMED SULAIMAN MIRZA 1975

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This thesis conducts an empirical and theoretical investigation of the effects of marketing on various aspects of the macro economy. The consumption, labour supply and wage-determination functions are tested empirically using advertising, consumer credit and industrial research and development expenditure to represent marketing influence. The short-run effect of marketing on income and employment and the long-run effect of marketing on growth are investigated theoretically.

The empirical tests show that marketing has a significant positive effect on aggregate consumption, the labour supply and the money wage rate. These results have interesting implications for the analysis of employment and growth in an affluent society.

The theoretical analyses suggest that marketing should be included as a separate expenditure sector in short-run income analysis, that both marketing and investment should be included as dynamic variables in growth models, and that the theory of the backward bending supply curve of labour should be modified.
ACKNOWLEDGEMENTS

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CHAPTER I
INTRODUCTION

North America has been aptly described as the Affluent Society. Yet the macroeconomic theory which is used to describe and analyse North American society was first developed by Keynes for a society - the British economy - which even now can only be described as a developed society, and which at the time of Keynes' writing was experiencing a prolonged period of massive unemployment.

Keynes set himself the task of providing a solution to the problem of unemployment in a developed market economy. To this end the Keynesian revolution has proved to be a success. The developed societies of Western Europe have not experienced in the post-war period the high levels of unemployment characteristic of the 1930's.

The Keynesian macroeconomic model is inherently a static model describing a circular flow of income which is maintained at a constant level. However, with the problem of demand-deficient unemployment solved, economists were quick to point out in the early post-war years the one dynamic element in the Keynesian model, i.e., the accumulation of capital through continuous positive net investment. This led to the adaptation of the static Keynesian model, first by Harrod and Domar and later by the neo-classical growth theorists, to the analysis of growth in a developed society.

The Keynesian model is still the basic nucleus for the analysis of both short-run or static macroeconomic problems and long-run or dynamic problems associated with growth.
One of the questions to which economists have not yet addressed themselves, is whether the Keynesian model, both in its original static form and in its modified dynamic form, can adequately describe the way in which an affluent society functions. The fact is that economists have implicitly assumed the Keynesian model to be equally applicable to a developed and an affluent society; when the model is applied to an affluent society such as the United States, however, a number of contradictions has been observed.

The most obvious contradiction is that Keynes' paramount concern with the need to shore up aggregate demand by increasing the proportion of public expenditures (because of a continuous decline in the average propensity to consume as a society becomes wealthier\(^1\)) has proved to be irrelevant to the North American experience. The figures in Table 1.1 show that aggregate consumption as a proportion of gross national product has remained fairly stable in the post-war period despite the fact that gross national product in real terms has more than doubled during this period. There has therefore been no need for public expenditure, as a proportion of gross

---

\(^1\) In several places in *The General Theory* Keynes prophesied a widening gap between potential full-employment output and aggregate consumption, as a society becomes richer. This gap could not be filled by investment since a rich community is relatively well endowed with capital and therefore the "opportunities for further investment are less attractive." See J.M. Keynes, *The General Theory of Employment, Interest, And Money* (Harcourt, Brace and World, 1935), p.31 and pp.128-131.
national product, to increase to maintain full employment.\(^2\)

As Ruth P. Mack has observed, "The dominant fact about consumption in the United States today is its extraordinary high level. The dominant fact about its history is that though from early days of the Union it seems to have been high by contemporary European standards, it has increased rapidly at a relatively high rate compared with other places in the world."\(^3\)

Another contradiction in the Keynesian model as applied to an affluent society has to do with the nature of the aggregate consumption function.\(^4\) Despite the modifications of the Keynesian consumption function by the permanent income, relative income, and life-cycle hypotheses, the standard treatment of the consumption function is still that of a one-way causation from income, however defined, to consumption.

\(^2\) This is in marked contrast to most of the developed societies of Western Europe where the maintenance of full employment has been accompanied by a "growing public sector." In Great Britain for example, total public expenditures, including expenditures of the nationalised industries, accounted for 50 percent of gross national product in 1967/68, "...the total current and capital expenditure of the public sector, i.e., central government, local authorities and nationalised industries which amounted to \(\£15,711\) million in the year which has just closed, are estimated at \(\£17,392\) million for the financial year 1967-68. In 1966 this represented no less than 49 per cent of the gross national product so that in Britain the mixture of the private and public sectors now approximates to a 50/50 split." "The Rise in Government Expenditure," Barclays Bank Review, Vol. XLII, No. 2, May 1967, pp.25-27.

### TABLE 1.1

Components of Aggregate Demand as a Percentage of Gross National Product in the Post-War Period: 5 yearly intervals.

<table>
<thead>
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<th>Year</th>
<th>Billions of constant (1958) dollars</th>
<th>Percent of Gross National Product</th>
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<tr>
<td></td>
<td>Gross National Product</td>
<td>Consumption</td>
</tr>
<tr>
<td>1947</td>
<td>309.9</td>
<td>206.3</td>
</tr>
<tr>
<td>1952 (1)</td>
<td>395.1</td>
<td>239.4</td>
</tr>
<tr>
<td>1957</td>
<td>452.5</td>
<td>288.2</td>
</tr>
<tr>
<td>1962</td>
<td>529.8</td>
<td>338.4</td>
</tr>
<tr>
<td>1967</td>
<td>675.2</td>
<td>430.1</td>
</tr>
<tr>
<td>1972</td>
<td>790.7</td>
<td>526.8</td>
</tr>
</tbody>
</table>

Note: (1) Korean War Period.

Such a model "treats income exclusively as if it consisted of lottery winnings, visited willy-nilly on the spending units, sweeping all economic behaviour before it." 4

In an affluent society households have a choice of the kinds of jobs and associated wage rates, of the number of members of the family who will participate in the labour force, and of the degree of participation by each member. The household can therefore set its own consumption goals, "and the fact that one spending unit has a high standard of consumption expenditure (or saving, or both) may result in, rather than from, the fact that it has a higher total income." 5

As Bowen and Finegan have pointed out in a different context, a model of consumer behaviour which relaxes the assumption that the level of total family income is given recognizes the influence of "income aspirations" on the supply of labour of the household in the United States in the post-war period and explicitly assumes "that the family has the power to adjust its labor input (and thus the level of its income, within limits) to its consumption preferences, as well as the power to adjust its ratio of consumption to income." 6


5. Ibid., pp.21-22.

Marguerite Burk has suggested that some light has been thrown on the possibility of a causal relationship between consumption goals and family income by research conducted at the Michigan Survey Research Center. In a section entitled, "Relationship of Consumer Wants to Family Income," Burk notes that:

The relationship between (a) the levels of consumption and (b) the income-earning activity of individual families has been clarified by information assembled and analysed by Morgan and his colleagues at the Michigan Survey Research Center. They concluded, "...In this country, high levels of economic activity, a wide range of jobs open to women, and a short working week which makes a second job possible, allow people to affect their own incomes by the decisions they make. Higher incomes also make the choice of whether or not to live with relatives a genuine decision, rather than a matter of necessity, and one which will affect family income, even relative to budget standards.

Such opportunities for rational decision-making mean that family income itself is a result in part of a series of voluntary family decisions, not solely a predetermined factor that affects spending behavior. Consumption may help determine income.

In addition to the decisions which affect present income, the family also makes decisions which will affect future incomes of the parents or of the children. The future is affected by decisions about saving for retirement, moving to new jobs, whether to send the children to college, and how many children to have.

Thus individual consumers may vary their income or purchasing power, as Morgan pointed out, in order to buy more in a particular period; or they may use credit. The wife may get a job, the husband may work longer hours or he may shift jobs, or he may "moonlight" by taking an extra part-time job. The use of credit to expand purchasing power in a particular period, of course, has some limitations. But most American families, at all levels of income above the very lowest, buy ahead of income at least part of the time."

---

A third contradiction in the Keynesian model as applied to an affluent society follows from the inherently static specification of the short-run labour supply function. This labour supply curve is assumed to be backward-bending, implying that above some real wage rate an increase in the real wage will lead to a decrease in the supply of labour. Although the short-run labour supply curve is an instantaneous picture of labour supply behaviour, the shape of this curve was determined from observations over time. In the developed societies, including the United States, it has been observed that increases in real wages over time have been accompanied by decreases in average hours of work. Several cross-section studies also confirm that the instantaneous short-run labour supply curve is backward-bending.

Whatever the shape of the instantaneous short-run labour supply curve in an affluent society, the time-series evidence for the post-war United States does not support the hypothesis that in an affluent society, households reduce their supply of labour as incomes increase over time. Such a prediction is based on a failure to account for the influence of dynamic factors on the behaviour of the short-run labour supply curve.

8. For references to the general acceptability of the hypothesis of the backward-bending supply curve of labour, see chapter 5 of this thesis.

9. For references see chapter 5 of this thesis.

10. Some evidence is presented below in the present chapter. For more extensive evidence, see chapter 5 of this thesis.
Specifically, rising income aspirations, which is characteristic of an affluent society, produce upward shifts in the instantaneous short-run labour supply curve over time, which tend to offset the decline in the supply of labour implied in the static curve.

Bowen and Finegan, op. cit., pp. 234-235, commented on the dynamic effect of income aspirations on the labour force participation of married women in the post-war United States. Their comments are relevant to the total supply of labour by households:

Application of the cross-sectional income-effect coefficients to the changes over time in husband’s income leads to the prediction that the participation rate of married women 14-54 years of age would have declined by almost 8 points between 1948 and 1965 (rather than rising by nearly 15 points) had the real income of husbands risen as it did but had all the other variables included in the intercity regression model remained constant. We believe that this inference, drawn from a blend of the results presented in Tables 7-3 and 7-4, is misleading.

We think it is misleading because it is based on a key assumption of shakey nature – that at each absolute level of husband’s income (measured in constant dollars), the tastes of the typical household for additional income, vis-a-vis home goods and leisure, were essentially the same in 1965 and 1948. This is equivalent to asserting that a woman in 1965 whose husband had a certain real income would have felt no more of an inclination to work to acquire additional goods and services than a woman in 1948 whose husband had the same absolute level of real

11. In an extensive study of the relationship between rising incomes and expected increases in well-being by Katona, Strumpel and Zahn, the authors found that many more Americans than Western Europeans, expected their increase in incomes to be cumulative, and that many more Americans than Western Europeans attributed their increase in well-being to their own efforts than to any outside forces. See George Katona, Burkhard Strumpel and Ernest Zahn, Aspirations and Affluence: Comparative Studies in the United States and Western Europe (Mc Graw-Hill, 1971), chapter 4.
income. We find this hard to believe. Surely income aspirations have increased markedly over this period, as the general standard of living has risen, as intriguing new products have been introduced (and pushed by advertising campaigns which have had the television medium at their disposal over most of the postwar period), and as the "style" of life has changed in important respects (note, for example, the increasing desire for two homes). Given these developments, a real income of any given amount must have seemed much less adequate in 1965 than in 1948.

Putting the wife to work is one of the most obvious ways of augmenting an "inadequate" level of family income, and one would therefore expect higher income aspirations to have led to higher participation rates in 1965 than in 1948 among married women at any given level of husband's income. In short, the choice between leisure and more goods and services has no doubt been affected by the range of goods and services generally available. We are convinced that income aspirations have risen markedly over the postwar period and that rising income aspirations have in turn had a positive impact on the participation rate of married women - a positive impact which has offset, at least in part, the negative impact of the increasing absolute level of real income suggested by the cross-sectional coefficients.

Economists, tracing the historical development of the Western societies, have come to associate the transition from an underdeveloped economy to a developed economy, with an increase in leisure for the working class. Since most economists view the affluent society as a more developed stage of the developed society, it was natural that economists should assume an increase in the quantity of leisure demanded by households over time to be a characteristic of the affluent society. Thus Keynes predicted the coming of "three-hour shifts or a fifteen-hour week" and a general "nervous breakdown" due to excessive leisure, "of the sort which is already common enough in England and the United States amongst the wives of the well-to-do classes, unfortunate women, many of them, who have been deprived by their
wealth of their traditional tasks and occupations - who cannot find it sufficiently amusing, when deprived of the spur of economic necessity, to cook and clean and mend, yet are quite unable to find anything more amusing." 12

But to characterize an affluent society as one in which there is a noticeable increase in the quantity of leisure demanded by households over time is to miss one of the essential ingredients of being affluent, i.e., the importance of an abundant and efficient labour supply. Far from American wives being bored at home because of an abundance of leisure in an age of affluence, as Keynes had predicted, the increase in the labour force participation rate of married women in the United States in the post-war period has been one of the most striking phenomena, and one that has received the most attention from labour economists in the history of the American labour force. The participation rate for married women increased from 20.0 percent in April 1947 to 41.5 percent in March 1972. 13

With regards to the coming of the "three-hour shift or fifteen hour week", nothing can be further from the American experience. Levitan has observed that, "...in an age when the


prophets of cybernetics predict the disappearance of work in our society, the number of those who work 49 hours per week or more has increased, both absolutely and relatively.\textsuperscript{14}

Commenting on "the desire for more work," Katona, Strumpel, and Zahn, \textit{op.cit.}, p.127, note that:

In the past few years, the reduction of hours worked appears to have come to a standstill in all the countries studied. For the United States, government figures indicate, contrary to the popular impression, that the length of the workweek declined very little between 1947 and recent years and is now increasing. From 1948 to 1965, the number of people other than farmers working more than forty-eight hours per week increased sharply, rising from 4.0 million to 9.4 million, or from 12.9 percent to 19.7 percent of the full-time nonfarm work force.\textsuperscript{15}


\textsuperscript{15} It is extremely difficult to accept the idea that average hours in the United States for full-time workers has stabilized around 40 per week when we have become so accustomed to expect a decline in average weekly hours and when so many people have been predicting a 35 hour week, even a 30 hour week, for so long. Yet the figures speak for themselves. Average weekly hours in manufacturing was 40.4 in 1947 and 40.6 in 1972. Average weekly hours in mining was 40.8 in 1947 and 42.5 in 1972. Average weekly hours in construction was 38.2 in 1947 and 36.9 in 1972. Only in retail trade which the part-time married females dominate, has average weekly hours declined substantially - 40.3 in 1947 and 33.6 in 1972. All figures are from table C-3, p.190 of \textit{Manpower Report of the President 1972}, \textit{op.cit.} Bowen and Pinegan, \textit{op.cit.}, p.229 note that, "...the postwar decline in the average work week for married women has come about partly as a consequence of an increase in the relative number of part-time jobs." Yet they estimate that, "...the length of the average work week for married women decreased from about 39 hours in 1948 to about 35 hours in 1965," (p.227). If with the increase in part-time work, married women were still working an average of 35 hours per week in 1965, this is an indication of how far we are away from a standard 35 hour week for all workers.
The short-run labour supply curve of Keynesian macroeconomic models proves to be inadequate in analysing labour market conditions in an affluent society, in another way. This is because it fails to emphasize the "adaptive dynamism" of the American labour force:

The Keynesian modification of the Classical labour supply curve was important in that by pointing out the downward inflexibility of the money wage rate, it recognized the role of both demand/supply and institutional forces in the labour market. This Keynesian modification, however, suffers from two drawbacks when applied to an affluent society. The first drawback is that it tends to over-emphasize the role of trade unions as the vehicle for wage-push in labour markets. The second drawback is that it does not deal adequately with the post-war situation of continuous upward revisions in the money wage rate.

In the *General Theory*, Keynes suggested that workers will resist any cuts in their money wage rates. According to Keynes, "the effect of combination on the part of a group of workers is to protect their relative real wage," by resisting a reduction of money-wages. Thus the implicit mechanism through which workers resist cuts in money-wages is combinations or trade unions.

The trade union movement has become much stronger and more powerful in Great Britain in the post-war period than at the time of Keynes' writing. It was not therefore unnatural that economists in Britain should identify the trade union
movement as the primary vehicle of wage-push, in their cost-push theories of inflation. For example, several of the empirical studies of the Phillips Curve in Great Britain have identified "trade union pushfulness" as one of the important explanatory variables of the rate of change of money wages. More recently, Mishan has attempted to explain the post-war inflation in Britain in terms of union militancy. What is interesting about Mishan's arguments is the emphasis he places on "the revolution of rising expectations" as an explanation of why unions are more militant in the post-war period than in earlier periods. He claims that the post-war obsession with growth by governments, by the mass media, and by every segment of the population, has created in workers the expectation of continuous increases in real wages. Workers therefore combine in the post-war period not simply to prevent cuts in their money wages but to ensure continuous upward revisions in their money wages.


It was noted above that the failure to incorporate the dynamic effect of rising income aspirations on the behaviour of the short-run labour supply curve over time is one reason for observed inconsistencies in Keynesian macroeconomic models as applied to an affluent society. But as Mishan and others have suggested, rising income aspirations also introduce wage-push in labour markets. Workers attempt to increase their incomes not only by increasing their supply of labour but also by "forcing up" real wages.

If the "revolution of rising expectations" has been an important wage-push factor in Britain in the post-war period, we would expect, from what has been said above about rising income aspirations being more intense in an affluent than in a developed society, that this revolution of rising expectations would have an even greater impact on wage-push in the United states. Even Mishan seems to suggest that much of the revolution of rising expectations in Britain was imported. He notes that:

The fact that real wages today are calculated to be about twice as high as those prevailing in the 1930's has no deterrent effect whatever. What matters are the comparisons as of now. And everybody in Britain knows, by now, that real earnings in most of West Europe are higher than those here, and that in America they are about twice as high as they are in this country. British officials have repeatedly referred to such statistics, and newspapers never cease to remind

18. See the comparative studies referred to above by Katona, Strumpel, and Zahn.
the citizen of them. 19

While the phenomenon of wage-push is an important characteristic of an affluent society, the mechanism through which wage-push operates in an affluent society is crucially different from the process of combination suggested by Keynes and Mishan. While it cannot be denied that unions have been the vehicle of wage-push in Great Britain - witness the rise of the Labour Party and the influential position of the Trades Union Congress in Britain in the post-war period - 20 to attribute such a role to unions in the United States is again to miss one of the essential ingredients of being affluent. This essential ingredient, as noted above, is not only an abundant but also an efficient


20. "1945 saw the election of a Labour government with a large majority and the application of economic policies that secured full employment. This placed the unions for the first time in a position of great strength particularly because they considered that the government was favourably disposed towards them, and also because labour became a scarce commodity. The unions were able to push up wage levels systematically without undue militancy by pursuing moderate policies." K.S. Reader, The Modern British Economy in Historical Perspective (London: Longmans, 1969), p.191.
labour supply. While unions are concerned about wage increases, their paramount concern is with job security for their members. Unions, therefore, militate against the mobility, flexibility, and adaptability of labour, which is characteristic of an

21. "Productive effort is stepped up to meet rising levels of aspiration. The effort can take two forms. The less dynamic pattern is characterized by providing more of the same kind of labor supply, that is, by adjusting upward the time devoted to gainful employment. The more dynamic form of adjustment consists of changing the quality of the labor supply, that is, of striving toward advancement by the acquisition of improved skills or education; or it may involve occupational and geographic mobility... there are different degrees of positive reaction to change. The more limited response may be called participation and the more intensive, adaptation. A high and rising degree of participation in the economic process is a prerequisite for a growing consumer economy. The participative individual offers much to the economy, mainly in the form of labor, and demands much from it in goods, services, and security. Yet high levels of participation do not suffice to meet the challenge of progress. The purely participative individual, although tending to work harder or longer to raise his level of living, hesitates to take up new behavior patterns or to strive for more education or change in his status. Rapid socioeconomic change in industrial economies requires not just more of the same labor, goods, and services, but different inputs and outputs. The modern adaptive consumer not only participates intensely in market processes but also changes his behavior according to the requirements of the situation, and thus facilitates and even anticipates new technologies and styles of life." Katona, Strumpel, and Zahn, op.cit., pp.12-13.
affluent society.\textsuperscript{22} It is not clear whether the relatively less attention given to the "trade union pushfulness" variable in U.S. studies of the Phillips curve was a deliberate recognition of less influence by trade unions in the wage determination process in the United States compared to Britain, or just

\textsuperscript{22} The extent to which unions dominate the U.S. labour market is an empirical question which is not the subject of investigation here. However, the percentage of the labour force unionized has been declining in the U.S. in the post-war period. Union members as a percentage of the civilian labour force has declined from 24.5 percent in 1947 to 23.1 percent in 1966. See Friedrich Baerdwald, \textit{Economic Progress and Problems of Labor} (2nd ed.; International Text-Book Company, 1970), p.43. Baerdwald attributes this decline to the increase of white-collar workers relative to blue-collar workers in the post-war period. White collar workers are reluctant to join unions because they identify more closely with management. However, an important observation by Baerwald, which is relevant in the present context, is the correlation between higher education and reluctance to join unions. Baerwald notes that there is, "a widespread feeling that graduation from college lifts a person to a status in which collective action to improve conditions of pay and advancement is not required." (p.44). There can be little doubt that the educated worker is more concerned with moving up the job ladder than with the job security provided by unions. This is not to say that union workers do not receive a "decent" wage. As Baerwald observes, "the large number of poor in the United States have rarely been included in the ranks of organized labor. For many, getting a job in a unionized industry would be a tremendous improvement and might actually point the way toward a rise not only in economic but also in social status." (p.33). However, this discussion is not concerned with the "working poor" but with those workers who feel so self-reliant and dynamic, that they prefer to operate as individuals than through collective bargaining. The relative decline of unions in the U.S. is also discussed in John Kenneth Galbraith's \textit{The New Industrial State} (Boston: Houghton Mifflin Company, 1967), p.3, p.263, pp.264-270 and pp.274-275.
Before explaining the vehicle of wage-push in the affluent society it is necessary to refer again to the comparative study of Aspirations and Affluence by Katona, Strumpel and Zahn. This study found the following relevant differences between Americans and West Europeans.

1. "Many more Americans than West Europeans attribute their progress to their own efforts rather than to any outside forces." (p.42).

2. "...attitudes of British as compared to American and Canadian workers have often been criticized. When workers finish a job in Great Britain, 'they wait for the foreman to tell them what to do next. It is his responsibility; they do not worry about output at all. They work the slow steady gait they have been taught to maintain by their unions and fellow workers. In the United States and Canada they would not wait until they ran out of work to ask the foreman what to do next.'

23. An inter-industry study by Bowen found no relationship between the degree of unionization and wage increases in various industries. "We have left until last the most widely and heatedly discussed relationship of all - the relationship between the degree of unionization and the rate at which wages in various industries have increased. Possibly the most important conclusion to be drawn about this relationship is a negative conclusion: When the effects of other wage-determining variables are allowed for, there is no simple relationship between unionization and wage behaviour." William G. Bowen, Wage Behavior in the Postwar Period: An Empirical Analysis (Princeton University Press, 1960), p.72.
American individual employees are self-reliant. They are frequently motivated by a desire for self-improvement, to seek training and education which increase their skill and knowledge, and the chances of advancement to better jobs.

Ter Hoeven concludes that the Dutch workers have become affluent consumers but that the higher level of consumption has hardly changed their mentality. Social subordination in the work organisation continues to be prevalent."

"The slow pace of higher income European manual workers in acquiring middle-class symbols of consumption suggests a lack of incentives to advance in status. It testifies to the persistence of a ceiling to their goals and horizons. As Popitz and his collaborators observed in an investigation of the workers in a German steel plant, they ignore changed reality and their opportunities in it. There is a peculiar mistrust of 'those on the top' a feeling of being passive objects of decisions made in the upper-class power structure, and a retreat to the realm of leisure and television.

In the United States less rigid class differences and the tradition of social mobility have joined forces with the rapid economic growth to make for faster adjustment and lesser survival of class or occupation-specific economic behavior." (p.35).
4. "There is no major area of behavior relevant for the economy that exhibits more striking differences among industrial societies than that of education. An educational revolution leaving its imprint on almost every aspect of society has been taking place in America for several decades. By contrast, in Western Europe educational progress has not begun to match the progress made in other areas of the social structure. Moreover, the gap in educational attainment between Europe and the United States has been growing ever-wider in the 1960's. (p.151).

In a path-breaking article, Alchian suggested an alternative vehicle of wage-push. This can be referred to as the "quit and search process." While Alchian restricted his analysis to the case of workers quitting rather than accepting wage cuts to make his analysis comparable with Keynes, this vehicle of wage-push can be generalized in the same way that Hines, Mishan, and others have generalized the Keynesian vehicle of wage-push to suit the post-war conditions, i.e., in the post-war period workers quit and search for higher paying jobs if their demands for pay increases in their present jobs are not met.

Alchian put forward the "quit and search process" as an alternative to unionization as the vehicle of wage-push. The

position taken in this thesis is that the "quit and search process" is the predominant vehicle in an affluent society while unionization is the predominant vehicle of a developed society. The reasoning is that for the "quit and search process" to be an effective vehicle of wage-push, workers must have the kind of dynamism, individuality, and belief in their own efforts as responsible for their progress, which Katona, Strumpel, and Zahn have suggested to be the characteristics of workers in the United States.

Mobility, adaptability, and a willingness to invest in education and training, are necessary conditions for the "quit and search process" to be effective. The extraordinary vigor with which Americans invest in human capital, the willingness to take risks in shifting from one job to another, and the much greater expectation and desire for cumulative income increases than West Europeans, suggest that the "quit and search process" is likely to be much more effective in the United States than in Western Europe. As Katona, Strumpel, and Zahn note:

Much of the basically favourable response to progress of the British common man is negated by his lack of mobility, geographic and occupational, which probably results from both the traumatic experience of mass unemployment in the thirties and the prevailing organisation of the housing market. According to the British antropologist Geoffrey Gorer, for the generation now in a position of power in the labor movement, unemployment is considered so destructive that the employed members of the working classes and their leaders tend to engage in all sorts of legal and semi-legal devices to "spread the work," to protect their
"mates as much as themselves. (op.cit., pp.179-180).25

It was suggested above that one of the essential ingredients of being affluent is an abundant and efficient labour supply. An abundant labour supply is provided by the upward shifts over time of the instantaneous short-run labour supply curve - what Katona, Strumpel, and Zahn call participation. An efficient labour supply is provided by the different mechanisms of wage-push as between an affluent and a developed society - what

25. This also suggests that Keynes was correct in postulating unions as the vehicle for resisting wage-cuts in the 1930's. In conditions of mass unemployment, it is reasonable to suppose that the fear of unemployment will be the foremost concern of each worker. In these conditions it is unreasonable to assume that any worker, individually, would risk prolonged unemployment by resisting a wage-cut so that he can search for a higher paying job. Since there is a high probability that he will not find a job at any wage, much less a job at a better wage, he will not take the risk. Relatively full employment is therefore a necessary, though not sufficient condition, for the "quit and search process" to operate. From this point of view, Alchian's analysis should not be looked at as an alternative to that of Keynes, but rather as postulating a mechanism which is relevant primarily to an affluent society such as the United States.
Katona, Strumpel, and Zahn call adaptation.\textsuperscript{26} While the phenomenon of wage-push is hypothesized as being universal to both developed and affluent societies in the post-war period, the different "mechanisms" between the two types of societies lead to different outcomes. Since the "quit and search process" requires continuous adaptation by the labour force i.e., job shifts, higher education, retraining, and so on, this kind of wage-push is more likely to lead to productivity increases, and therefore real wage increases, than to inflation. The

\textsuperscript{26} By now the reader would have guessed that the difference between the affluent United States and the developed Western Europe is due more to different levels of adaptation than to different levels of participation. However, the United States even has a higher level of participation than Western Europe. "More American than European middle-aged married women hold jobs. In the United States about 55 percent of all married women age forty-five to fifty-four are employed (1964) compared to 40 percent in Germany (1965) and 35 percent in France (1962). Labor force participation of women is still rapidly on the rise. In spite of the relatively abundant possessions and high standard of living of the average American family, there are no signs of saturation or of slackening effort to supplement the basic income of the head of the household." (Katona, Strumpel, and Zahn, op.cit., pp.170-171).

"At present the differences in working time, to be discussed in Chapter 9, are not large between the United States and Western Europe. But in the last two decades working time has been greatly reduced in Europe, while it has changed little in the United States. Vacation rights for workers were introduced earlier in Europe and are at present more extensive there than in America. For instance, German salaried as well as hourly employees now have on the average close to four weeks of paid vacation time. Many employees are also entitled to a vacation bonus in addition to their regular salaries. The number of paid holidays also appears to be larger in Europe than in America. (Ibid., pp.109-110).
phenomenon of wage-push in affluent societies, therefore, is an important source of productivity increase. It is the mechanism which ensures an increasingly efficient and productive labor force, one of the characteristics of an affluent society.27

The investment in human capital, one of the factors in the "quit and search process," has been advanced recently as an explanation for the high productivity of the American economy compared to the West European Economies.28

One of the contradictions which can be resolved by a recognition of the "quit and search" process is the large observed increases in productivity in the American economy which cannot be explained either by increased capital accumulation or

27. The study by Katona, Strumpel, and Zahn, op.cit., pp.58-59, found that a large proportion of English and German workers were of the opinion that a major function of income increases was simply to compensate for price increases. On the other hand, only a small proportion of American workers see inflation as the cause for receiving higher wages and salaries. Most Americans believe that their standard of living should steadily and continuously rise.

by technological progress embodied in capital. The "quit
and search process" is an explanation of both the large
accumulation of knowledge capital in the United States and
technological progress embodied in labour. Again, a developed
and an affluent society can be contrasted in that whereas
the former has experienced substantial capital accumulation
and technological progress embodied in capital, with a relatively
low degree of accumulation of knowledge capital and technolo-
gical progress embodied in labour, the latter has experienced
substantial amounts of both.

29. Note that these were the only two sources of growth en-
visaged by Keynes. "From the earliest times of which we
have record — back, say, to two thousand years before
Christ — down to the beginning of the eighteenth century,
there was no very great change in the standard of life of
the average man living in the civilised centres of the
earth...

This slow rate of progress, or lack of progress, was
due to two reasons — to the remarkable absence of impor-
tant technical improvements and to the failure of capital
to accumulate...

The modern age opened, I think, with the accumulation
of capital which began in the sixteenth century... From
that time until to-day the power of accumulation by com-
 pound interest, which seems to have been sleeping for many
generations, was re-born and renewed its strength. And
the power of compound interest over two hundred years is
such as to stagger the imagination...

At the same time technical improvements in manufacture
and transport have been proceeding at a greater rate in
the last ten years than ever before in history. (J.M. Keynes,
"Economic Possibilities for Our Grandchildren," op.cit.).
1.1 THE SIGNIFICANCE OF MARKETING ACTIVITY TO THE MACRO-ECONOMIC ANALYSIS OF AN AFFLUENT SOCIETY.

The final contradiction, and from the point of view of this thesis, the most important contradiction which the Keynesian model as applied to an affluent society gives rise to, follows from its attempt to explain both the statics and comparative statics of income determination, and the dynamics of growth, without any reference to a marketing sector. The aim of this thesis is to show that the incorporation of a marketing sector into the basic Keynesian framework, and the analysis of the impact of marketing activity on other macroeconomic sectors of the economy, provide us with a more adequate understanding of both the comparative statics of income determination and the dynamics of growth in an affluent society. Alternatively, by identifying marketing as a dynamic variable similar to, and equally important as, investment in an affluent society, the contradictions referred to in the previous section can be easily explained. For example, it will be suggested that marketing is the exogenous variable which is responsible for the continued increase in aggregate demand without a disproportionate enlargement of the public sector, that marketing is responsible for the upward shifts in the short-run labour supply curve in the post-war period, and that marketing induces wage-push, thereby causing increases in the productive effort of the labour supply via the quit and search process.

Marketing activity is not a clearly defined concept. In the marketing literature, the definition of marketing has been
changed as marketing has developed over the years. However, it is clear that in the marketing literature, marketing is defined to include both distribution and costs of promotion. In this thesis, marketing is defined to include only promotion, though in practice it is difficult to distinguish between pure distribution and pure promotion. From the point of view of the economics profession, the concept can be most easily grasped by thinking in terms of components of the marketing-mix. These components include advertising, consumer credit, new product research and development, market research, personal selling, sales promotion and publicity.

Marketing activity, however defined, is not a post-war innovation. As Baran and Sweezy have suggested the sales effort is much older than capitalism as an economic and social order. Nor is marketing exclusively a North American phenomenon. However, marketing was completely ignored by Keynes as having any relevance to an explanation of the macroeconomic process of a developed society. Economists, following in the Keynesian tradition, continue to ignore, for the most part, the relevance of marketing even when the Keynesian model is applied to an affluent society such as the United States. Two reasons can be advanced for the relative neglect of marketing in the Keynesian tradition. The first reason is the peculiar role which marketing has played in the historical development of the

United States compared to the economies of Western Europe, especially Britain. The second reason, and perhaps the more important one, is the relative importance of marketing in the post-war period compared to the earlier period.

The first reason has to do with attitudes, culture and historical experience. A distinguishing feature of North American development is the social, economic and political importance of entrepreneurship. North America is a new society built on the protestant ethics of free competition and private enterprise. Unlike Western Europe where ownership of land, the professions, politics and the church competed with business for men with outstanding ability, in the United States the only avenue for personal distinction was business. Success in business meant not only economic power but also social prestige and political influence.31

An important consequence of the all-pervading attraction of business was the constant pressure for expanding markets. The number of successful businessmen is naturally limited by the extent of the market. Businessmen therefore not only competed for existing markets, but attempted to "create" new markets and expand existing ones by market research, developing new products, providing credit, and advertising and selling campaigns.

31 The social origin of English entrepreneurial deficiencies is compared with the American experience in the 19th century by A.J. Habakkuk, American and British Technology in the 19th Century (Cambridge University Press, 1962), pp.190-194.
Lekachman has made the following comparison between English and American businessmen in the late 19th century:

Far from evincing proper reverence for British leadership, German and American businessmen displayed a disgustingly aggressive competitive spirit, and they employed advertising with a skill and ruthlessness unmatched by their more complacent English rivals. It was an English economist, H.S. Foxwell, who "remembered proudly that he was taught as a child never to buy a product that was advertised." It was the same Foxwell who in 1917 remarked that "most of our best people never, or very rarely, advertise." Possibly the "very rarely" represented the austere moralist's concession to the spirit of the age.32

Another distinguishing feature of the North American experience was the type of markets which they catered for. European expansion, and in particular British industrialization in the 19th century, was founded on the exploitation of colonial markets for the sale of crude manufactures. Although foreign trade was not unimportant to the United States, exports never accounted for more than five or six percent of total output compared to 25 percent for Britain and 20 percent for Germany, before 1914. Paul Mazur has observed that:

History tells of the economic rule of the world during the nineteenth century by the British Empire from its headquarters in England. Perhaps the twentieth century will tell of American economic leadership... But there is a difference. Nineteenth-century Britain's domination was obtained primarily by the establishment of foreign markets, only secondarily by the exploitation of home markets. Historians of the twentieth century may tell how the New World

built its progress upon intensive development of domestic markets. Important as they are, foreign markets have obviously been subordinate. Britain required foreign trade to keep alive. The U.S. had no such need. The reasons for the great difference between the economic situations of Great Britain and the U.S. are many. But the most striking reason lies in the contrasting treatment of home markets in the two countries, and in their respective emphasis on distribution of goods to home consumers.33

From early times therefore, American producers catered for a relatively high income market, i.e., the home market. This bias in North American development became more significant with the rise of the new industries - automobiles, electrical appliances - and the introduction of mass production techniques in the post-World War I period. Most writers in the marketing literature suggest that mass production techniques could not be introduced without extensive advertising and sales-promotion, and that the new industries producing consumer durables would hardly have come into being without the provision of instalment credit by firms. On the introduction of mass production techniques, Diamond and Pintel have noted that:

It was not until the close of World War I and the emergence of mass production as a factor in American industry that the importance of marketing was established. Until then, the demand for goods had exceeded the supply and expensive marketing systems were not required. With mass production, the supply

of goods is almost unlimited, whereas the demand for goods, though growing, lags behind. In the 1920's for the first time in American history, surplus goods suddenly exceeded demand. This resulted in a Buyer's market (more goods available than purchasing power) rather than a seller's market (more purchasing power available than goods). Such conditions lead to fierce competition among producers to increase their share of the market.

One way of increasing sales is to give the customer what he wants, when he wants it, where he wants it, and at a fair price that he is willing to pay. This is another way of saying that the answer to overproduction is improved marketing.34

On the relevance of consumer credit during the post-World War I period, Cole and Hancock explain that:

The automobile, the electric washing machine, the vacuum cleaner, and other household goods made great strides during this period. Consumers began to enjoy a wider variety of goods, many of which contributed to an increased enjoyment of life. The widespread use of such merchandise called for even greater utilization of credit arrangements. Several hundred sales finance companies were established during this period. Many of them grew to large proportions in a matter of a few years. Paralleling this development other consumer credit institutions had similar growth and development, as the greater variety of goods found their way into American homes. Merchants who formerly had regarded installment selling with skepticism now began to regard time payment plans as an integral part of their merchandising program. While this type of selling was enjoying a rapid growth and was gaining a more respectable place in the American economy, the cash lending institutions were also registering dramatic change. From 1923 to 1929 the number of regulated small loan offices increased from about 600 to approximately 3,500. The services of these institutions were in such great demand by American consumers.

households that they increased their loan balances sixfold. 35

Similarly, Kjellberg notes that:

Modern consumer credit is an accompaniment of the development of a mass consumption economy, related especially to the growth of a mass market for automobiles and other durable goods. For this market to flourish some method had to be developed for the financing of purchases of high-priced items over extended periods, and this took the form of instalment credit. 36

The emphasis, so far, has been on the peculiar importance of marketing to the historical experience of the United States. Naturally, the relative importance of marketing to North American development has been carried over into the post-World War II period as the following comparisons show. In 1951 U.S. advertisers spent $43.36 per capita compared to $2.91 per capita for English advertisers. 37 In 1967, expenditure per capita on advertising in the United States was $55.5 compared to $19.2 for the United Kingdom. 38 "Turning now to attitudes toward borrowing,


we find widespread acceptance of the use of consumer credit in the United States and overwhelming disapproval in Germany.\(^{39}\)

The second reason suggested for the relative neglect of marketing in the Keynesian tradition is that marketing only became an important phenomenon, even in the North American economies, in the post-World War II period. The reason seems to be simply a matter of the stages of economic development and the various stages of development of marketing activity itself. It was noted earlier that marketing became relatively more important to North American development with the rise of the new industries and the introduction of mass production techniques. However, the "take-off" of marketing at this stage was halted.

\(^{39}\) Katona, Strumpel, and Zahn, \textit{op.cit.}, p. 98.
by the Great Depression and the Second World War. Several writers have commented both on the relative importance of marketing in the post-World War II period and on the revolution that has taken place in the concept of marketing itself.

The causes of the Great Depression are many and complex. However, it is plausible that one of the contributing factors was the fact that the "new era of marketing" did not have enough time to establish a firm foundation. As Robert Elder suggests, "Back in the 1920's most managements were primarily production-minded. They had done miracles in producing goods in greater volume at lower unit costs. Their big job had become to sell more goods to more people. They turned to selling and advertising as tools to make people buy what the manufacturers wanted to produce. Salesmanship was in its crude, brash era. The philosophy was to grab the prospect by the lapel, look hypothetically into his eye, and convert his 'no' into a 'yes'. It worked to a certain degree, but it proved a pretty inefficient way of marketing. By 1927 and 1928 the business papers were full of discussions of 'profitless prosperity'.

Goods were being sold, but it was costing too much to sell them. How much of a factor this was in the debacle that finally came in 1929 is subject to some argument, but there can be little doubt that it was at least an important contributing factor." Robert F. Elder, "Distribution Costs - Yesterday, Today, and Tomorrow," in Westing, op.cit., pp. 6-7. By the end of the Great Depression came the Second World War and the mass production techniques were mobilized for the war effort. It was therefore only after World War II that marketing was able to make a substantial contribution to the economic process.
Although the role of distribution - at this moment (1947) - is subordinate to that of expanding production, the time will come when mass production, and the standard of living it is capable of supporting, will be dependent as never before on the enlargement of domestic markets through intensive sales promotion and other distribution techniques.41

It is not surprising that Quesnay's Tableau Economique operates without promotion or that Marshall's conception of the economy had small place for promotion, because promotion was indeed a minor aspect of earlier economies for reasons we shall explore. Unlike such economic activities as production, exchange, consumption, investment, and even research and development, promotion is a relative newcomer... In earlier years there was little of what is now called, in the pretentious but not meaningless phrase of today's businessmen, "creative selling."42

Yet large and variegated as the arsenal of these "means of inner compulsion" may have been in earlier times, it is only under monopoly capitalism in its most advanced stage - in the United States today - that they have assumed gigantic dimensions. This expansion has profoundly affected the sales effort's role in the capitalist system as a whole; from being a relatively unimportant feature of the system, it has advanced to the status of one of its decisive nerve centers. In its impact on the economy, it is out ranked only by militarism. In all other aspects of social existence, its all-pervasive influence is second to none.43


In the early 1920's, and perhaps earlier for some industries, the supply of goods in most industries began to overtake the demand. The resulting surplus situation generated a drive by some industries, or by some firms in some industries, to find new markets and new means to move their goods into these markets. The idea of mass distribution to match mass production emerged...

Yet inspite of this turning to the market place to generate demand, business firms' real focus remained on production. Decisions made by the firm's executive remained production-based. Production, production runs, costs - these were the governing criteria of business. Marketing as we now know it had not yet emerged...

The notion that in order to continue to successfully and profitably grow, firms must develop a market orientation did not pervade the entire business community at once. Highly perceptive and astute executives began to arrive at the concept individually. Although the concept of marketing did not become widespread until the 1950's, some executives were aware of and utilized market forces well before World War II.

...Some firms remain production-centered, inner- and self-oriented. Some pay lip service to marketing but continue to make decisions without regard to market forces, real or latent. Even in business schools, marketing is still regarded by some professors as only one of the work specialities of the firm involved in selling and distribution activities.

But marketing is the most pervasive force in the entire firm, as well as one of the most dynamic forces in the economy. As we will see, marketing will be the most significant aspect of business in the last third of this century.44

The expansion of competitive efforts to change people's buying habits has been an increasingly important factor in the trend toward better living standards and economic growth. Eighty-six percent of the growth of advertising in the last century took place in the

twenty-five years since 1940 - and this accounts also for 84 percent of the total growth in standards of living as measured by personal consumption expenditures. 45

The relative importance of marketing in the post-World War II period can be gauged from the following tables. Table 1.2 compares three components of the marketing-mix - advertising, consumer credit, industrial research and development - with gross national product and with expenditures by the government and investment sectors, in the post-World War II period. In this table expenditures on consumer credit is estimated as 15 percent of consumer credit balances outstanding. This can be regarded as the average rate of interest on consumer credit. 46

Table 1.2 shows that marketing expenditures have increased as a percentage of gross national product from 3.5 percent in


46. This is undoubtedly a crude estimate of the average rate of interest because of the large number of consumer credit plans available and the large number of different lending institutions. Instalment credit provided by departmental stores cost between 12 and 18 percent - See Cole and Hancock, op.cit., p.89. Credit provided by the commercial banks cost between 10 and 16 percent - Ibid., p.136. Consumer Finance Companies charge between 24 and 36 percent - Ibid., p.139 and p.141. An important reason for the high interest rate charged by Finance Companies is the relatively small sums provided to each borrower - Ibid., pp.141-142. Credit Unions charge between 11 and 12 percent - Ibid., p.144. Industrial Banks and Loan Companies charge between 16 and 20 percent - Ibid., p.147.
1947 to 5.9 percent in 1972. During this same period, gross investment as a percentage of gross national product fell from 16.6 percent to 15.5 percent. Government expenditures, as a percentage of gross national product, increased at a slower rate than marketing, in the post-war period. The absolute values in table 1.2 show that marketing is becoming an increasingly important component of aggregate demand. The 1972 figures show that marketing expenditure was 37.7 percent of gross investment and 32.4 percent of government expenditure. The figure for marketing expenditure is of course an underestimate of total expenditure on marketing as defined in this thesis, since the figure does not include several components of the marketing-mix directed at promotion. Among the more important elements of promotion not included in the marketing figure given in table 1.2 are personal selling.47

47. "While we do not have accurate totals for costs of personal selling, we do know they far surpass advertising expenditures. In manufacturing, only a few industries, such as drugs, toiletries, cleaning products, tobacco, and beverages, have advertising expenditures which are higher than those for personal selling. In countless companies, advertising runs 1 to 3 percent of net sales, while in many firms the expenses of managing and operating a sales force run from 8 to 15 percent of sales." William J. Stanton, Fundamentals of Marketing (3rd ed.; Mc Graw-Hill, 1971), p.539.
TABLE 1.2


<table>
<thead>
<tr>
<th>Year</th>
<th>Gross National Product (a)</th>
<th>Gross Investment (b)</th>
<th>Government (c)</th>
<th>Expenditures on three Components of the Marketing-Mix (d)</th>
<th>Gross Investment (e)</th>
<th>Government (f)</th>
<th>Total Marketing (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947</td>
<td>300.0</td>
<td>51.5</td>
<td>30.9</td>
<td>16.7 5.71 2.72 2.22</td>
<td>16.6</td>
<td>12.0</td>
<td>3.5</td>
</tr>
<tr>
<td>1952</td>
<td>395.1</td>
<td>60.5</td>
<td>32.1</td>
<td>16.5 8.10 3.73 4.56</td>
<td>15.3</td>
<td>23.3</td>
<td>4.2</td>
</tr>
<tr>
<td>1957</td>
<td>452.5</td>
<td>68.8</td>
<td>39.3</td>
<td>25.4 10.57 7.03 6.90</td>
<td>15.2</td>
<td>19.7</td>
<td>5.6</td>
</tr>
<tr>
<td>1962</td>
<td>520.8</td>
<td>79.4</td>
<td>18.7</td>
<td>31.7 11.70 10.83 9.13</td>
<td>15.0</td>
<td>20.3</td>
<td>6.0</td>
</tr>
<tr>
<td>1967</td>
<td>575.2</td>
<td>101.2</td>
<td>140.2</td>
<td>41.5 14.35 13.96 13.21</td>
<td>15.0</td>
<td>20.8</td>
<td>5.1</td>
</tr>
<tr>
<td>1972</td>
<td>790.7</td>
<td>122.9</td>
<td>143.0</td>
<td>46.3 15.78 13.37 17.14</td>
<td>15.5</td>
<td>18.1</td>
<td>5.2</td>
</tr>
</tbody>
</table>

Notes: (1) Total of Advertising, R&D Exp., and estimated cost of Consumer Credit. (2) Estimated as 15 percent of Consumer Credit Balances Outstanding.

promotion, publicity and packaging. An important component of the marketing-mix which has seen particularly rapid development and innovation in the post-World War II period is consumer credit. The extent of consumer credit can be measured by several indices. Table 1.3 compares two indices of consumer credit - total balances outstanding and instalment credit extended - with gross national product in the post-World War II period. The figures show that consumer indebtedness as a percentage of gross national product

48. Note that in the marketing discipline the term sales-promotion is used to mean those promotional activities other than personal selling, publicity and advertising. It includes displays, premiums, trading stamps, samples, brochures, matches, window stickers, contests, coupons, catalogs, convention booths, and calendars. See Downing, op.cit., p. 331.

49. "Most companies recognize that packaging is important for purposes of protection and convenience. The activity has been production-oriented in most firms, however, and marketing and sales values have been ignored. This attitude is changing, however, and the marketing significance of packaging is being recognised to a growing extent...

Packaging today is a major business activity. It is estimated that 4 cents out of every dollar spent on goods and services goes into packaging. In 1966, United States manufacturers spent about $15 billion on packaging materials; that was nearly as much as the total amount - $17 billion - spent on advertising that year." Stanton, op.cit., pp.250-251.
TABLE 1.3

Indices of Consumer Credit compared with Gross National Product in the Post-War Period: 5 yearly intervals.

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Gross National Product (a)</td>
<td>Total Consumer Credit Balances Outstanding (b)</td>
</tr>
<tr>
<td>1947</td>
<td>309.9</td>
<td>14.89</td>
</tr>
<tr>
<td>1952</td>
<td>395.1</td>
<td>30.41</td>
</tr>
<tr>
<td>1957</td>
<td>452.5</td>
<td>46.02</td>
</tr>
<tr>
<td>1962</td>
<td>529.8</td>
<td>60.84</td>
</tr>
<tr>
<td>1967</td>
<td>675.2</td>
<td>88.09</td>
</tr>
<tr>
<td>1972</td>
<td>790.7</td>
<td>114.26</td>
</tr>
</tbody>
</table>

Source: (a) See table 1.1
(b) See table 1.2.
(c) Economic Report of the President (Jan. 1973), table C-59, p.263.
has increased from 4.8 percent in 1947 to 14.5 percent in 1972. The annual extensions of instalment credit has also become a larger percentage of gross national product each year, rising from 5.3 percent in 1947 to 13.2 percent in 1972. During this period while gross national product grew at a rate of 3.8 percent per annum, consumer credit balances outstanding grew at the rate of 8.5 percent per annum, and annual extensions of instalment credit grew at the rate of 7.7 percent per annum. 50

1.2 PREVIEW OF OTHER CHAPTERS.

In this introduction an attempt has been made to distinguish between an affluent and a developed society. It has been suggested that marketing activity is an important feature of the affluent society and that the Keynesian model needs to be modified to take account of this important characteristic of an affluent society. The following chapters of this thesis attempt to provide such a modification of the Keynesian model.

Chapter II provides a review of the relevant literature. This review emphasizes the growing importance of marketing in the United States in the post-World War II period, and examines previous attempts made by writers both in marketing and economics, to analyse the impact of marketing activity on the economic outcomes of the society.

50. Rates of growth were computed by using the formula 
\[ E = P(1+r)^n \] where E is the 1972 value, P is the 1947 value, r is the annual rate of growth, and n = 25.
This chapter also describes various indices of marketing activity used throughout this thesis, particularly in the empirical chapters. Some justification is given for the use of these indices, and previous use of these indices made in the literature, is examined.

Chapter III is the main theoretical chapter of this thesis. Part I of this chapter incorporates a marketing sector in the traditional static Keynesian macroeconomic model. It shows that the addition of marketing as a component of aggregate demand increases the equilibrium level of income bringing it nearer to the full employment level. It also shows that the income multiplier with respect to a change in marketing expenditure is larger than the income multiplier with respect to a change in investment or government expenditure. Appendix A to Part I of Chapter III provides some crude estimates of the short-run and long-run income multipliers with respect to changes in marketing expenditure.

Part II of chapter III analyses the effect of marketing on growth. The basic framework used is the Harrod-Domar growth model. Marketing is seen to have similar dynamic effects as investment. It is shown that while the introduction of marketing into the dynamic model increases the rate of growth of the capacity of the economy, it requires a higher rate of growth of aggregate demand to maintain full employment. The analysis suggests that marketing is an important source of technological progress embodied in labour. Some intuitive insights on the effect of marketing on the knife-edge problem are offered.
Chapter IV is the major empirical chapter of the thesis. It carries out an extensive empirical test of the effect of marketing on the aggregate consumption function using both single-equation and simultaneous equation techniques. The results are compared with existing studies which are relevant. The results strongly support the hypothesis that an increase in marketing leads to an increase in aggregate consumption over time.

Chapter V is a semi-theoretical, semi-empirical chapter which investigates the effect of marketing on the aggregate labour supply. It is shown that contrary to the popular view average weekly hours of work by full-time workers have not declined in the post-war period. Both this change from the pre-war trend, and the post-war increase in female participation rates, are explained by outward shifts in the short-run aggregate labour supply curve over time caused by increases in marketing. This hypothesis that marketing increases the household's supply of labour over time is supported by the empirical tests carried out in this chapter. All empirical tests in this chapter are single-equation tests.

Chapter VI is primarily an empirical chapter. The basic hypothesis which is tested is that marketing operates as a wage-push factor in the labour market. The model used for testing this hypothesis is the Phillips Curve model of wage determination. Marketing is introduced as an additional explanatory variable in several variations of the Phillips equation. Marketing is also compared with unemployment and
profits as an explanatory variable for changes in the money wage rate. The results support the hypothesis that marketing should be included as an explanatory variable in the Phillips model of wage determination.

Chapter VII provides a summary of the more important results obtained in this thesis. It suggests a number of limitations due primarily to a lack of data on total marketing expenditures on promotional activities, and the fact that the National Income Accounts does not separate out the expenditures in the marketing sector in the same way as it separates out expenditures in other sectors, i.e., investment, consumption and government. The chapter concludes by suggesting areas for further research.
CHAPTER II

REVIEW OF THE RELEVANT LITERATURE AND A DISCUSSION OF THE INDICES OF MARKETING ACTIVITY.

The objective of this review is to show that as a market economy develops, marketing activity plays an increasingly important role in maintaining the growth and prosperity of this type of economic system, and that the market economy of the United States has reached that stage of economic development where the failure to distinguish and analyse the contribution of the marketing sector implies an inadequate macro-economic analysis of both the comparative statics and the dynamics of this economy.

Marketing activity is obviously associated with a market or free enterprise economy. However, economic analysis of the market economy has traditionally devoted very little attention to marketing activity compared to other functions of the market economy - production, distribution, consumption, investment and government. There are two reasons for this. The first is that marketing activity or promotion1 becomes important only in the latest stage of capitalist economic development. The second reason is also historical in that in developing a new framework for macroeconomics, Keynes paid no attention to the theories of monopolistic competition and the

1. In this thesis the terms marketing activity and promotion are used interchangeably. In the marketing literature, marketing is defined to include both promotion and distribution. This is not the case here.
associated analysis of selling costs, which were being developed at the time of Keynes' writing. The result is that the microeconomic foundations of post Keynesian macroeconomics is one of perfectly competitive goods markets where marketing has no role to play. Julian Simon says that, "It is not surprising that Quesnay's Tableau Économique operates without promotion or that Marshall's conception of the economy had small place for promotion," but he finds it difficult to understand why "promotion has no place in most modern analytic schemes of the economy, either."²

It is interesting to consider why, if promotion has size and possible importance, it has been left out of economic schema. The reason is, I think, that promotion requires exchange. Advertising can speed and increase exchange of a good, but it cannot begin the process of exchange. Exchange can exist without any promotion,... But promotion cannot exist without exchange. Because promotion is therefore not causal in the crudest sense, and because promotion has not been important historically, it has been reasonable to neglect promotion when considering the structure of development of economies.

It is only when one focuses on the finer detail of economic development, as does Schumpeter, that one sees that promotion might be important just as are other changes in commercial practice, because it is such "discontinuous" changes in the structure itself, each of which may be small but which bulk large in the aggregate, which effect economic growth.³

³ Ibid., pp.172-173.
The foundations of neoclassical value theory are based on the assumption of perfectly competitive markets. All traders in such markets are assumed to have perfect knowledge, and every seller can sell as much as he wants to at the going market price. For both of these reasons, promotion has no role to play in the neoclassical framework. However, the neoclassical economists were aware that the real world was not one of perfectly competitive markets. As such, marketing activity was recognised as one of the important functions of a market economy.

Marshall's Analysis of the Role of Marketing.

Marshall devoted two chapters of his *Industry and Trade* to the "problems of general marketing."

His distinction between constructive and combative advertisements has become a standard reference by subsequent works on advertisement and selling costs.

Marshall made the following comment on what he called the "marketing reputation" of a business, which in today's marketing literature comes under the heading of publicity, one of the functions of promotion.

The marketing reputation and connection of a business may be a larger property (or "capital") in proportion to its earnings, than is the fixed plant of a manufacturer in some industries. Reputation for fairness and generosity in dealing, is a property seldom acquired without special effort and sacrifice.

and is a powerful factor of success in all the undertakings of a business.\(^5\)

Marshall noted that although marketing is beneficial to both consumers and producers in the modern world, the consumer has a choice of sellers from whom he can purchase a given commodity. The producer, on the other hand, is in competition with other producers for the consumer's business, and therefore the producer's position is more vulnerable. It is for this reason that the marketing function is provided by producers rather than consumers.

The organisation of trade is in the long run as vital to consumers as to producers and traders; but the ever increasing energy, with which sellers push their goods on the notice of buyers, is an inevitable result of modern developments.

... For a buyer in the modern world can nearly always get what he wants from other sellers and on about the same terms, if his negotiations with a particular seller fall through. The seller on the other hand... has less certainty of selling at current prices whenever he wants to do so...\(^6\)

Marshall also suggested that developments in marketing were usually pioneered in the United States. With regards to the rise of department stores he notes that, "France is thus the original home of Department-stores, and they have prospered in Britain, Germany and other countries. But their methods and their potentialities are congruous with American character and

\(^5\) Ibid., p.270.
\(^6\) Ibid., pp.271-274.
conditions, both economic and geographical; and their most notable developments belong to the New rather than the Old World. 7

On the growth of brands and trademarks he notes that, "And American experience, which pioneers in many matters of this kind, suggests that brands and other trademarks on things for domestic consumption will ere long become an important factor in the spread of large capitalistic control over industry and life." 8

Finally, Marshall noted that one of the reasons why retail prices in the United States were higher than in Britain was because of relatively large expenditures on advertisements in the United States.

Some of the implements of constructive advertisement are prominent in all large cities. For instance a good frontage on a leading thoroughfare; adequate space for the convenience of employees and for customers; lifts and moving staircases, etc., are all constructive, so long as they do not exceed the requirements of the business... But eager rivalry often causes them to be carried to an excess, which involves social waste; and ultimately tends to raise the charges which the public have to meet without adequate return.

Again, printed advertisements regarding particular transactions, such as horses for sale, or hire; contracts to be let out; vacancies, etc., have seldom any considerable combative effect... Again, advertisements in trade newspapers; and, especially such as

7. Ibid., p.296.
8. Ibid., p.300
are largely occupied with technical and scientific discussions, are generally terse, explanatory and constructive. . . .

Exceptionally constructive are all those measures needed for explaining to people generally the claims of some new thing, which is capable of supplying a great but latent want. If the thing is in small compass, easily handled, and not costly, samples of it can be distributed in various ways. But if it is expensive, and above all if it cannot be adequately handled without considerable training, then people can be fully informed of its usefulness only by seeing it at work. In such a case as that of the typewriter, when first introduced, efficient demonstration is beyond the scope of any but powerful capitalists...

In conclusion it should be noted that academic students and professional advertising agents in America have united in applying modern methods of systematic and progressive analysis, observation, experiment, record, and provisional conclusion, in successive cycles to ascertaining the most effective forms of appeal. Psychology has been pressed into the service; the influence which repetition of an advertisement exerts has been subsumed as a special instance of the educative effect of repetition.9

The Contributions of Veblen and Pigou on the role of Marketing.

In chapter eleven of his Absentee Ownership Veblen discusses the rise of salesmanship in the United States.10 Veblen attributes this increase in salesmanship to the fact that American manufacturing industry while "inordinately productive, and increasingly so", caters primarily for the home market with the result that production has a tendency to outrun demand. "On the side of sales and salesmanship the outcome has been a continued increase of selling-costs and a continually more


Veblen was particularly concerned with the rapid growth in one of the components of the marketing-mix. This component, which goes under the heading of packaging in the current marketing literature was referred to by Veblen as the "pro-mulgation of saleable containers."

... the vogue of "package goods" is to be credited wholly to salesmanship, and its cost is chargeable in the main to that account. The designing and promulgation of saleable containers, - that is to say such containers as will sell the contents on the merits of the visual effect of their container, - has become a large and, it is said, a lucrative branch of the business of publicity. It employs a formidable number of artists, demonstrators, interpreters; and more than one psychologist of eminence has been retained by the publicity agencies for consultation and critical advice on the competitive saleability of rival containers and of the labels and doctrinal memoranda which embellish them. The cost of all this is very appreciable, but it is a necessary cost. Taking them one with another, it is presumably safe to say that the containers account for one-half the shop-cost of what are properly called "package goods," and for something approaching one-half of the price paid by the consumer.12

As to the future growth of marketing Veblen made the following prediction.

The number of concerns and the aggregate capital and personnel engaged in the business of sales-publicity is already very considerable, and the growth in all these respects, as well as in the volume of the

11. Ibid., pp.287-288.
12. Ibid., pp.300-301.
business hitherto, goes on unchecked, with a very promising outlook for continued growth at an accelerated rate in the near future.\textsuperscript{13}

Pigou discussed the effect of marketing in chapter 9, part II of his \textit{Economics of Welfare}.\textsuperscript{14} He referred to it as a new form of \textit{investment} where conditions of monopolistic condition prevailed (p.196). Like Marshall he distinguished between competitive advertisement and advertisement which "fulfilled a social purpose."

\textsuperscript{13} Ibid., p. 314.

\textsuperscript{14} A.C. Pigou, \textit{The Economics of Welfare} (Macmillan, 1st ed. 1920, 4th ed. 1932, reprinted 1962), pp.196-200. Note that although both Marshall and Pigou used the term "advertisement" in their discussions rather than "marketing," it is clear from their texts that their discussions were concerned with selling effort or promotion in general, rather than with advertisement alone. Thus Pigou says, "That a considerable part of the advertisement of the modern world is strictly competitive is plain. This is true alike of the more obvious forms, such as pictorial displays, newspaper paragraphs, travellers, salesmen, and so on; and of the more subtle forms, such as a large exhibit of jewellery in the shop window, the according of credit, with the consequential expenditure on book-keeping and on the collection of recalcitrant debts, expenditure in keeping shops open at hours inconvenient and costly to sellers, and other such forms." \textit{Ibid.}, p.196. See also the quote from Marshall on pp.50-51 of this thesis.
The Theory of Imperfect Competition and Chamberlin's Contribution to the Role of Marketing.

The last source to be mentioned among the ultimate origins of the book *The Theory of Monopolistic Competition* is that of substantial reading in the literature of Business Economics, in general, but also with some special reference to "distribution," to retail markets, and to the phenomenon of advertising.

With respect to the latter especially, the neglect by theoretical economics of a force of such overwhelming importance in the real world had long seemed to me an anomaly; and, as I remember it, the conviction that advertising was a necessary part of the hybrid theory I was trying to write was brought home with great force by the well-known footnote in Pigou, *Economics of Welfare*: "Under simple competition there is no purpose in this advertisement, because, *ex hypothesi*, the market will take, at the market price, as much as any one small seller wants to sell."

A prime feature of pure competition then must be the total absence of advertising, an activity therefore logically attributed to the monopoly elements in the situation - the existence for each seller of a market distinct from those of others, and which he tries to expand through selling efforts. It seemed clear at last why selling cost had been left out of economic theory. There was simply no place for it in the theory of competition, i.e., in the theory of "perfect" competition (which was widely regarded as the theory of the subject in its most abstract and general form). And on the other hand, under the prevailing dichotomy there was evidently no place either for such a highly competitive activity in the theory of monopoly. Yet how naturally selling cost falls into place in a theory whose very purpose is to analyse monopoly and competition in a framework of interrelationship, rather than of mutual exclusiveness.15

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The theory of monopolistic competition provided a necessary analytical framework for the integration of marketing and value theory. While the analysis of selling effort by economists was not unknown prior to the work of Chamberlin, Hans Brems has noted that, "To the best knowledge of the writer, Professor Chamberlin was the first theorist who analysed selling costs thoroughly."\(^\text{16}\)

Chamberlin discussed selling costs in chapters 6 and 7 of his *Theory of Monopolistic Competition*. He defined selling costs as "costs incurred in order to alter the position or shape of the demand curve for a product... Advertising of all varieties, salesmen's salaries and the expenses of sales departments, margins granted to dealers (retail and wholesale) in order to increase their efforts in favor of particular goods, window displays, demonstrations of new goods, etc., are all costs of this type." (p.117)

Selling costs affect demand because of "imperfect knowledge and the possibility of altering people's wants by advertising or selling appeal."

Certainly new products and new varieties of old products would have virtually no market at all without selling outlays of this sort. Similarly, the markets for older, better established products could be increased but slowly and within narrow limits if nothing

were expended for, selling - that is, if the producer merely sat and waited for orders to come in. (p.119).

Selling costs can be distinguished from production costs according to the following criterion: "of all the costs incurred in the manufacture and sale of a given product, those which alter the demand curve for it are selling costs, and those which do not are costs of production." (p.123).

Chamberlin recognized that, "the two costs are interlaced throughout the price system, so that at no point, such as at the completion of manufacture, can one be said to end and the other begin." However, one way of identifying the two costs is by "a successive consideration of the outlays of everyone who has had anything to do with producing or selling a good, from the retailer or salesman back to its obscure origin. Many costs will at once fall wholly into one category or the other... In other cases an outlay covers both, and the total must be divided according to the degree to which it pertains to one function or to the other."

On the significance of the distinction between selling and production costs, Chamberlin notes that:

The distinction between the two types of costs is as fundamental for value theory as the distinction between supply and demand, and indeed arises necessarily from it. Costs of selling increase the demand for the product on which they are expended; costs of production increases the supply. It would seem that there could be no more simple and obvious mistake than to combine them, yet economic theory has done exactly this, counting all the entrepreneur's outlays as his "costs of production." Perhaps it would be more exact not to say that they have been combined (since they have never been distinguished),
but that selling costs have been completely ignored. (pp.125-126).

The opportunity provided by the analytical framework of the theory of monopolistic competition for the integration of marketing and value theory was taken up neither by economists nor by writers in the marketing literature. It is true that several texts were published on the theory of imperfect competition subsequent to the work of Chamberlin, and that most texts on microeconomics now contain a chapter on selling costs or non-price competition. However, the following comment by Chamberlin still reflects the general consensus:

I may begin by reporting briefly on what success has been met in persuading general, as distinct from business, economists to open the theoretical doors and let nonprice competition in. The answer is easy: very little. It has perhaps had its best success in the textbooks, where it is not at all unusual in recent years to find a chapter on advertising, or perhaps more generally on nonprice competition, together with others on product differentiation, oligopoly, and so forth. But any number of general and recent treatises in economic theory could be named in which it is not even mentioned.


With regards to Chamberlin's influence on the marketing literature, the following comments by Grether\textsuperscript{20} sum up the situation:

To begin with, the only major systematic endeavor to portray the history and development of marketing thought makes no specific reference to Chamberlin. Bartels, in twelve chapters and in a lengthy bibliography of marketing literature containing many hundreds of publications and writers, somehow overlooked both Chamberlin and his classic volume...

Fully 103 books published since 1930 and clearly labeled within the field of marketing, retailing, and consumer analysis, were found to have no reference at all to Chamberlin...

With the same simple library procedures of selection, 40 books published since 1930 in the field of marketing, retailing, and consumer analysis with specific, direct references to Chamberlin were discovered...

For the most part, however, with a very small number of exceptions to be noted below, monopolistic competition analysis was introduced in the pricing portion of the treatments without being integrated into the total or over-all analysis...

The primary objective of most American marketing scholars down to the period of the Great Depression was to provide a systematic, factual, descriptive body of knowledge...

With surprising dispatch, considering the complexities and variety of the broad field of marketing, a number of eclectic, taxonomic, descriptive treatments appeared...

The significance of all of this to the purpose of this essay is to show that the descriptive, taxonomic, and eclectic managerial approaches to some extent had away from economic analysis. This was especially so

because the taxonomies of the descriptive marketing literature were the natural ones of the real world and not the behavioral ones of the analysis of competition in economics. The literature and results both in economics and in marketing might have been vastly different if this type of differentiation had not occurred. Applications to both private and public policy and decision making might have been much sharper if the literatures of marketing and applied economics had flowed along the same channels instead of different ones.

Insofar as economic theory appeared, it was by direct, simple borrowing on the part of marketing teachers and writers, and did not involve either adaptation or creative advancement.

2.2 MARKETING AND MACROECONOMICS.

Although the authors surveyed so far have looked at marketing primarily from the point of view of microeconomics, their works are of some relevance to macroeconomic theory. Thus the recognition by both Marshall and Pigou that advertisements are both constructive and combative has important implication for macroeconomic analysis. For advertisements which are not competitive affect macroeconomic variables. 21 Veblen commented on this aspect of marketing explicitly.

21. Strictly speaking all advertisements (and marketing in general) are competitive. However, advertisements which provide competition between firms for the same product, and between products for the whole economy, have only microeconomic significance. On the other hand, advertisements which provide competition between consumption and savings in the aggregate, or between goods and leisure, have macroeconomic significance.
There is a qualification, to be noted for what it may be worth, that the current, very urgent, sales-publicity may be presumed to divert a little something from savings to consumptive expenditures, and so may add that much of a margin of funds to the volume of purchasing-power currently available for expenditure on advertised goods. For what it may be worth, this unremitting impulsion to spend rather than save is to be counted in as a factor in the case.  

Chamberlin also commented on the possible macroeconomic implication of marketing activity. He notes that an individual "may be persuaded to consume a larger amount of any commodity only by reducing correspondingly his consumption of other things."  And in a footnote to this observation he says, "Leisure included, i.e., he may work longer hours, sacrificing leisure in order to enjoy more goods."  

Dorothea Braithwaite's classical article on "The Economic Effects of Advertisement", provides a useful bridge in moving from the microeconomic aspects of marketing to the macroeconomic aspects.

Like Chamberlin, Braithwaite provided a thorough analysis of the distinction between "the costs of manufacture and the costs of selling." Selling costs are again divided into what Braithwaite calls "true" selling costs, which are "expenses inevitable to the transfer of commodities from producer to consumer," and "advertisement costs." "True" selling costs include the costs of transport, costs of preparation, sorting and grading, the costs of holding, and the cost of information or getting into touch with buyers. Advertisement cost include the cost of printed advertisement, expenditure...

26. Chamberlin observed in a footnote to his own analysis that, "Since this and the following chapter were written an article has appeared by Dorothea Braithwaite ("The Economic Effects of Advertisement," Economic Journal, Vol. XXXVIII [1928], p.16), who distinguishes between production and selling costs, divides the latter into 'true' selling costs and advertising costs, and discusses the effects of the latter upon the national dividend and economic welfare." Chamberlin, 1962, op.cit., p.126, n.1.

27. Note that what Braithwaite calls selling costs is equivalent to what is called marketing costs in the current marketing literature. And Braithwaite's division of selling costs into "true" selling costs and "advertisement costs" is similar to the division of marketing costs into costs of distribution and costs of promotion in the current marketing literature. Braithwaite's "advertisement costs" is therefore the equivalent of what is called marketing in this thesis.
on travelling salesmen, "free offers," competitions, coupons, window displays and other devices for attracting buyers. It "represents expenditure by the seller, not in putting the goods on the market, but in inducing the buyer to accept them. Without this expenditure it would be impossible to market the same amount of goods, not, as in the former case, because the supply would not be available where it was required, but because the demand curve would be too low."

Braithwaite notes that advertisement may be "competitive within the trade" or "not competitive within the trade but which aims at increasing the total demand for a particular commodity." According to Braithwaite the latter form of advertisement has "recently become of increased importance."

More important from the point of view of this thesis, Braithwaite notes that:

We may, however, imagine the case in which all commodities are advertised so successfully that all subjective valuations are increased. Obviously they cannot all be increased with regard to each other or with regard to money, for this would have no meaning. But they might all be increased with regard to leisure - that is to say, that the balance between the marginal disutility of effort and the marginal utility of commodities might be so altered that people would be induced to put forth rather more effort in order to obtain more commodities. (p.24).

Like Veblen, Braithwaite predicted an increase in marketing activity in the future:

... the prevalence of advertisement makes it increasingly difficult for a manufacturer who does not advertise to find purchasers for his goods, even though he produces the standard quality at the market price... Advertisement affects the consumer's
judgment of commodities and his desire for them to a degree which it is hard to realise. We find on the one hand, he will often fail to buy goods which are offered below the market price if they have not been brought to his notice and their merits dinned into his ears by advertisement; while, on the other hand, his consumption can be enormously increased by advertisement, even though the advertised product may be more expensive than an unadvertised variety of the same commodity...

In almost every trade to-day we find that such advertisement costs are incurred. A few manufacturers spend money on advertisement in order to increase their sales, and their rivals are forced to follow suit...

Moreover, the position of the successful advertiser is strengthened by the fact that reputation is costly to create, and becomes progressively more costly as an increasing number of manufacturers resort to advertisement. For the louder the chorus which already assails the consumer, the more difficult and expensive does it become to bring any particular appeal to his attention. The manufacturer in any trade who succeeds in creating a reputation obtains a certain monopoly advantage, and his rivals, finding the difficulties of marketing enhanced, have in their turn to incur advertisement costs. But, since they have to create reputation in the face of one already established, the probability is that their advertisement costs will be heavier than those of the original manufacturer. This will again react on him and tempt him to incur still more considerable expenditure. Thus the process is cumulative, and the amount spent upon advertisement tends continually to increase. This tendency is accentuated by the fact that a growing number of producers in all trades are adopting the use of advertisement. (pp.28-32).

Marketing and the Keynesian Revolution.

It was noted above that Keynes made no reference to marketing activity in the General Theory. It was even suggested that one of the reasons for the failure of post Keynesian economists to integrate marketing into the framework of macroeconomic analysis was due to this neglect by Keynes of the theory of imperfect competition and the relevance of...
marketing. Baran and Sweezy have correctly pointed out that the theory of imperfect competition "has had astonishingly little influence on the analysis of the functioning of the system as a whole. In this area, of course, the greatest advances during the last three decades have been associated with the name of Keynes whose magnum opus, *The General Theory of Employment, Interest and Money*, was published in 1936. Though this was several years after Robinson and Chamberlin opened fire on traditional price theory, Keynes showed no trace of influence from the new theories. His work and that of his followers (including, paradoxically enough, that of Mrs. Robinson herself) has remained within the tradition of orthodox business cycle theory, taking the competitive price system for granted and seeking to explore the consequences of certain new, and in many ways more realistic and relevant, assumptions at the macro-economic level."²⁸

Despite this neglect by Keynes of the theory of imperfect competition and the consequent absence of marketing in his analytic framework, the Keynesian revival of macroeconomic analysis was a necessary pre-condition for any meaningful analysis of the effect of marketing on the economic system as a whole. Rima has observed that:

> With the publication of *The General Theory*, macroeconomic analysis once more claimed the center of

the stage. Not the allocation of resources among alternative uses, but rather whether resources would be employed at all, became the primary question economic theory sought to answer.

... the problem to which Keynes addressed himself, namely, the problem of the level of economic activity, is fundamentally different from that with which his classical and neoclassical predecessors concerned themselves. On a macroeconomic level the classicalists (i.e., the orthodox writers who preceded Marshall) were more concerned with the problem of long-run secular development than with the problem of cyclical disturbance. The latter problem was conceived of primarily as a problem of gluts and over-production, and was considered to be self-correcting. Though the nature of the self-corrective mechanism was not explored in more than a cursory fashion, it was Say's law, with its dictum that supply creates its own demand, which provided the basis for their conclusion. Neoclassical theorists, that is, those in the Marshallian tradition, were mainly concerned with the problem of optimizing and relating the price-determining process to the maximizing activities of individuals and firms. Thus, when Keynes focused his attention on the problem of an underemployment equilibrium, he was dealing with a problem that his predecessors scarcely touched on. One would, for example, search Marshall's Principles of Economics in vain for any discussion of the problem of underemployment or its relationship to income determination. Yet, this is the essence of the Keynesian problem and the basic difference between it and all that went before. It is its analysis of the problem of aggregate demand and the implications of this analysis for policy making which separate Keynesian theory from the traditional.29

Julian Simon has recognized explicitly the relevance of the Keynesian revolution to the analysis of marketing. He says that:

Thirty-five years ago the topic of this chapter would have been literally inconceivable; nobody would have asked the questions which this chapter asks except some contemporary economic quacks and some long-ago economists such as Malthus. But since Keynes (or at least until recently) perhaps the most important single issue to government economic planners in the United States and some other industrialized countries has been aggregate demand, and the forces that influence demand. This chapter considers the extent to which advertising may be an important force in influencing aggregate demand by way of influencing the individual propensity to consume. 30

The Keynesian framework was therefore essential to any macroeconomic analysis of marketing. The first economist to take advantage of the Keynesian revolution to analyse the contribution of marketing to aggregate demand was K.W. Rothschild. 31 Rothschild's article, although appearing a few years after the General Theory, has been largely overlooked by post Keynesian economists. 32

Rothschild began his article by observing that:

The literature on the technical and psychological aspect of advertising is increasing quickly, and


32. Baran and Sweezy have noted that most economic theorists have ignored the effect of advertising on "aggregate effective demand." In a footnote to this observation they recognize that, "The most notable exception, and we believe the first, was K.W. Rothschild. See his unfortunately little noticed paper 'A Note on Advertising,' Economic Journal, April 1942." Baran and Sweezy, op.cit., p.124.
year after year a great number of handbooks on advertising are published. This flood of publications shows the importance which advertising has gained, and is still gaining, in our economic environment. And yet in economic theory advertising seems still to be the Cinderella who is not worthy of being mentioned too often.

Rothschild correctly pointed out that economic theory had so far restricted itself primarily to the microeconomic aspects of advertising, i.e., "the examination of the selling expenditure of the individual entrepreneur." It was because of the underlying assumption of full employment which characterized neoclassical value theory that Marshall, Pigou and other economists, had denounced advertising as a misuse of productive resources. "If there is full employment, it is obvious that the habit of advertising will lock up considerable resources in a socially useless struggle for an increased share in total production or greater monopolistic power, instead of using them for the production of consumption or capital goods."

In the absence of full employment advertising is an important component of aggregate demand which increases the level of employment. "It creates new incomes and increases old ones, and through the well-known multiplying effect, the initial employment in the advertising trades will lead to further employment in the consumption industries, and finally in the investment industries."

But in addition to the direct contribution of advertising as a component of aggregate demand, Rothschild was also aware that advertising contributes to aggregate demand by shifting up the aggregate consumption function. "But
advertising has a second salutary effect on the employment situation, and that is its stimulating effect on consumption. Besides creating new incomes, advertisements lead to an increased propensity to consume for all income receivers."

Rothschild, although willing to admit that it would be "extremely difficult to get an idea of the quantitative effects of advertising" on the aggregate consumption function, was convinced that the quantitative effects were significant. "All we can say is that the habit of advertising must be responsible for a considerable increase in the propensity to consume. We must only look at the great power of political propaganda, which often reshapes old and fundamental habits of a population, in order to appreciate the psychological importance of repeated publicity. And political propaganda has only derived its methods from commercial advertising and transferred them to another sphere."

Rothschild was also convinced that advertising expenditures, as a component of aggregate demand, were significant. He attempted to illustrate the significance of advertising as a component of aggregate demand by comparing it with expenditures on public works in Britain.

Without going into details, we can assume that the annual expenditure on advertising is somewhere near

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33. In a footnote Rothschild says that, "I cannot think, at present, of any other expenditure which has this double effect."
Estimates for the United States vary between $200 million and $400 million. Such an expenditure is certainly not negligible, and it may be interesting to compare the figure of $100 million with the special expenditure (central and local) of Britain on public works which expressly aimed at the relief of unemployment. Here, too, full statistics are not available, but Mrs. Hicks estimates that £14 million or £15 million were spent in the years of maximum grants, but much less in most of the other years.

Contributions from the General Macroeconomics Literature.

The suggestion by Rothschild that expenditures should be analysed as an independent component of aggregate demand, was not followed up by later economists.\(^{34}\) To the extent that

34. One exception is the work of Hans Brems. Hans Brems has been an exceptionally close follower of the work of Chamberlin (See his Product Equilibrium under Monopolistic Competition, op. cit.). It was therefore not surprising that he was one of the few economists to see a possible relationship between Chamberlin's work and the Keynesian revolution. In his Output, Employment, Capital, and Growth: A Quantitative Analysis (New York: Harper and Bros, 1959), he notes that, "The Chamberlinian and Keynesian revolutions were entirely unrelated originally and remained so for a long time. To most economists, the theory of monopolistic competition contained interesting propositions relating to resource allocation in a fully employed economy; on the other hand, Keynesianism has contributed to an understanding of an underemployment equilibrium... A notable feature of the theory of monopolistic competition is its insistence on the product itself and advertising outlay as variables; surely one would expect variations in the product and in advertising outlay to affect the determination of the national output no less than one would expect price policy to do so." (pp.83-84).

In this same work Brems took up Rothschild's suggestion that marketing expenditures, as a component of aggregate demand, is significant. He says that, "Another possible hypothesis is that product variation and advertising will affect the input-output function in such a way that the propensity to purchase factors rise... Obviously advertising and other forms of selling effort imply the purchase of factors. (pp. 86-87).
macroeconomics gave any consideration to marketing at all, such consideration was restricted to the effect of marketing on the aggregate consumption function. Even so, marketing was not treated as a single set of interdependent activities. The macroeconomics literature, in general, analysed independently the effect of various components of the marketing-mix. By and large, the economics profession identified three components of the marketing-mix which might each independently affect the aggregate consumption function. These are new products, consumer credit and advertising, although the analysis of advertising was sometimes extended to include other forms of promotion or "selling effort."

In the immediate post-war years most economists accepted the Keynesian hypothesis of an aggregate consumption function which was linear and nonproportional. However, it was soon realized that a consumption function which was linear and nonproportional could not be stable over long periods of time.35 And a new set of long-run data produced by Simon Kuznets suggested a long-run consumption function which was linear and proportional.

Economists felt that some way of reconciling a nonproportional short-run consumption function with a proportional long-run consumption function, was necessary. One of the first attempts to provide such a reconciliation was made by

Smithies' reconciliation was based on the idea that the short-run nonproportional consumption function is subject to upward secular drift. One of the reasons suggested by Smithies for this upward drift was the constant introduction of new products and the incorporation of these into the customary standard of living. He says that:

The explanation of the trend factor in the formula must await further investigation. It may arise from any of three factors:

... iii. Rising living standards have increased minimum costs of living. For instance, if refrigerators become necessaries for families who previously regarded them as luxuries, the proportion of income consumed will tend to increase. (p.6).

Klein was another economist who suggested early in the post-war period that marketing might explain the upward drift in the short-run consumption function.

The natural forces which were lowering the propensity to save were changes in consumer tastes, the growth of the advertising industry, the increasing degree of urbanization, the increase of educational opportunities, the increased use of consumer credit. The first two forces (consumers' tastes and the growth of the advertising industry) are related. Consumers were propagandized by advertisements that the "American Way of Life" called for certain expenditures (two cars in every garage, e.g.) that they had not previously been accustomed to make. The advertising industry has certainly had a bad influence on many aspects of our lives. It has been grossly untruthful; it has caused waste; it has served to support wealthy vested interests;

but it has also served to maintain consumption at a level higher than it otherwise would have been. Advertising is not the best way to get a high-consumption, low-savings economy, but is a way. 37

William Fellner, writing at the same time as Klein, expressed a similar view about the relationship between marketing and the consumption function. Commenting on the divergence between the short-run and long-run consumption functions, he says that:

This divergence of the historical consumption function from the simultaneous consumption function may be explained in several ways. It has been suggested that the primary relationship might be conceived of as being in the nature of that reflected by table 1, and that the historical behavior of the function could be interpreted as being produced in the passage of time by continuous upward shifts of the household budget function. The trendlike upward shift suggested by this hypothesis might be the result of technological innovations, which place new products on the market, or of other impacts producing a continuous decline in thriftiness. It is conceivable that technological changes and the increasing sales effort on the part of producers and retailers tend to produce an upward shift of the consumption function. 38

Hans Brems, writing somewhat later than Klein and Fellner, was of the opinion that most economists support the hypothesis that advertising increased aggregate consumption. He notes that:


Extending Chamberlin's argument one might, of course, observe that since savings are a substitute for consumers' goods, they are likely to suffer when such goods are advertised. Hence, advertising of all consumers' goods is likely to increase aggregate consumption in the economy. But what if savings are advertised, too? Life and retirement insurance advertising in the United States seems impressive indeed, and the possibility arises, therefore, of advertising by consumption goods industries canceling that by nonconsumption-goods industries. We simply do not know much about this. Yet businessmen and economists have few doubts that advertising increases consumption for the economy as a whole. In fact, the opinion of our profession seems almost unanimous.

39. The following comments by Simons and Yancey are relevant however. "The only possible counterbalance to an increase in advertising, it would seem, would be an increase in advertising for savings institutions that may induce people to save some monies that they might otherwise spend immediately (cf. Norris, 1960). But the quantity of advertising for savings institutions is tiny relative to all other advertising." Simons, op.cit., p.194. "Advertising for savings such as life insurance, credit unions, savings bonds, savings accounts, saving and loan associations, and stocks and bonds could reduce the consumption-income ratio. An examination of advertising expenditures indicates that only a small fraction of advertising is for savings. In 1953, advertising costs for life insurance, stocks and bonds, savings and loan associations, savings banks, and credit unions amounted to less than 1.5 per cent of the consumption goods advertising costs. Television, radio, and magazine advertising, newspaper data, on a lineage basis, gives a comparable result of 2.4 per cent. It seems reasonable to assume then, that advertising for savings has negligible effect on the consumption income ratio." T.A. Yancey, "Some Effects of Selling Effort and Product Quality in a Dynamic Macroeconomic Model," unpublished Ph.D. thesis (University of Illinois, 1957), p.70.

Marketing and the Relative Income Hypothesis.

The relative income hypothesis developed by Smithies' student, James Duesenberry\(^{41}\) was another attempt to reconcile the short-run and long-run consumption functions. In the economics literature the reconciliations provided by Smithies and Duesenberry are usually regarded as diametrically opposed, i.e., Smithies assumes an inherently nonproportional consumption function which shifts up over time, whereas Duesenberry assumes an inherently proportional consumption function which is nonproportional in the short-run because of the cyclical growth in income and lags in the adjustment of consumption to income fluctuations. Duesenberry also denied that the shift factors suggested by Smithies - urbanization, more equal distribution of income, and new consumer products - could have been responsible for the strong upward trend in consumption in the pre-World War II period.\(^{42}\) Nevertheless, Duesenberry's analysis of consumer behaviour is directly relevant to the literature review of this chapter in that since Duesenberry's analysis, two restrictive assumptions about consumer behaviour have been removed from subsequent theories of the consumption function. These two assumptions are, "(1) that every individual's consumption behaviour is independent of that of


every other individual, and (2) that consumption relations are reversible in time."43

The implication of assuming interdependent preferences, according to Duesenberry is that, "if tastes are interdependent, a dynamic development in tastes is implied. Analysis of the dynamics of tastes requires an analysis of the driving forces in the development."44

In analysing the "driving forces" in the development of consumer tastes, Duesenberry notes that the improvement of a consumer's standard of living involves the consumption not only of more goods but also of better quality goods.45

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43. Ibid., p. 1.
44. Ibid., p. 17.
45. The question about the superiority of goods is determined by the consumer in a variety of ways. Duesenberry suggests that the ways in which consumers as a whole agree on the superiority of a good is unimportant. What is important is that at any time, "if a large number of people were asked to rank, in order of preference, a number of different types of automobiles, houses, or cuts of meat, the rank correlation would be high" (p.21). "Whether the agreement arises because of the objective differences in the goods in question or because of advertising or the prestige of fashion leaders need not concern us particularly at the moment" (p.21). However, from the point of view of this thesis it is important to understand the factors which underly the ranking of goods by consumers. For example, if advertising is important in introducing "superior" goods, then it does contribute to the dynamic development of tastes. Similarly Duesenberry notes that, "almost any activity can be carried out in a variety of ways and a variety of goods can be used to implement it" (p.20). If marketing increases the variety of goods available and makes available "superior" ways of carrying out a given activity, then marketing does contribute to the dynamic development of tastes. This seems to be recognised by Duesenberry in his discussion of the growth in sales of new products in part 2 of chapter VI.
quality goods are more expensive. Duesenberry assumes that everyone wants to improve the quality of goods he uses for any purpose.

The basic drive for improving the quality of goods consumed is the demonstration effect. "In given circumstances, the individuals in question come into contact with goods superior to the ones they use with a certain frequency. Each such contact is a demonstration of the superiority of these goods and is a threat to the existence of the current consumption pattern. It is a threat because it makes active the latent preference for these goods." (p.26).

The second assumption of consumer behaviour which was dropped by Duesenberry is that consumption relations are reversible in time. Duesenberry suggested that consumers adjust upwards their consumption plans in response to an increase in income quite readily. This is so since the basic drives in our society are towards a higher standard of living. However, it also follows from this that consumers will attempt to protect their existing consumption plans, and will not adjust readily to a fall in income. In a society in which income is growing over time, therefore, the tendency is towards higher and higher consumption levels.

The relevance of the relative income hypothesis to the analysis of consumer behaviour in the United States was taken
an important step further in the article by Ruth P. Mack. While Duesenberry emphasized the basic drives towards higher consumption levels as responsible for maintaining a constant savings ratio despite rising income over time, Mack suggested that the drive towards higher consumption levels was itself an important determinant of the growth in income over time. "I hold that one cannot adequately explain the most notable of the trends in America - the growth in real consumption and its high level throughout - without recognizing the unusual force of the drive to consume and its effect in activating productive effort." (p.19).

Mack notes that the high level and rapid growth of output in the United States cannot be explained without assuming "a zest for work and a willingness to take chances which themselves require explanation." (p.19). Mack's explanation is "the unusual interest in consumer goods that has characterized the American scene. Income, in short, is a function of consumption, via consumption standards, just as truly as consumption is a function of income." (pp.19-20).

The importance of Mack's contribution to the development of the theory of consumer behaviour lies in the dynamic role which she attributes to consumption. Aspirations

to consume are increased by forces other than the level of income. These aspirations, in turn, affect the rate of growth of income by increasing the supply of productive effort.

I have drawn a picture of what may be thought of as consumer enterprise - a companion piece to business enterprise - which has played an important part in economic growth in this country. The picture attributes to consumption a more active part in trend change than is implied by the thinking that lies behind notions such as propensities to consume and acceleration or multiplier models... spending, or the aspiration to spend, is necessary to provide the incentive to productive effort. (pp.29-30).

Mack comments on the relationship between her analysis and the relative income hypothesis.

As to the bearing of these observations on formal quantitative analysis of consumption, the long-term trends in consumption are a function of consumer income. Long-term trends in income are a function (via aspirations to consume) of consumption - present and past. The net regression of consumption on income (with or without other variables) calculated from time series for a period of years actually reflects this two-way causal association and in this sense the model is potentially mildly explosive.

But even if the net two-way association of income and consumption is all that can be measured, the association is not likely to be the same when derived from time series as when derived from area surveys of individual families at a given time. The latter should present a flatter regression than the former. That this is the case the figures show, and the explanation put forward in the "relative income hypothesis" is that standards influence consumption and therefore, as standards shift upward over time with rising income, saving is held in check. I make the further point that standards influence income. Over time, people want more goods and try to make the money necessary to buy them; since they earn primarily in order to spend rather than to save, their spending adjusts itself to the new level of income at a higher ratio than applied for their previous total income. This explanation
merely supplements the relative income hypothesis. (p. 30).

While Mack agreed with Duesenberry that the demonstration effect played an important role in the drive towards higher consumption levels, unlike Duesenberry, Mack suggested that marketing was also important. Commenting on the factors responsible for the desire for more goods, Mack says that:

Finally, many sorts of consumer goods are probably more strongly desired here than elsewhere because they are better. Inventive genius, the high rate of innovation, the high degree of mechanization, which is partly induced by high wage rates47 and partly made possible by the mass markets that high wage rates provide, have meant that the wants of American consumers have been titillated by the availability of particularly attractive new goods at a price that make them accessible to the many. These are goods that on the one hand are likely to form the spearhead of prestige demand and enterprising consumption and on the other hand benefit most from mass production for a mass market and enterprising production. There is, of course, an element of circularity in this reasoning, but if so, it is not the circularity of a closed ring but of a coiled spring. (pp. 23-24).

Mack's analysis of consumer behaviour marks an important departure from the traditional way in which economists

47. Note that one of the hypotheses of this thesis is that marketing is itself partly responsible for the high wage rates by inducing cost-push in labour markets.
previously viewed the Keynesian consumption function. The idea that the desire for increased consumption is itself a determinant of the rate of growth of income is directly relevant to one of the hypotheses of this thesis that marketing affects the supply of productive effort via its effect on the household's consumption plan. It is for this reason that although Suits did not directly concern himself with the effect

48. It is somewhat unfortunate that most economists continue to view the consumption function through "Keynesian eyes." For example, in a recent lengthy survey of the consumption function, Ferber makes no mention of Mack's work - See R. Ferber, "Consumer Economics: A Survey," Journal of Economic Literature, Vol. 11 (Dec. 1973), pp.1303-1342. On the other hand, an earlier review of the literature on the consumption function by Suits seems to have been significantly influenced by Mack's work. In discussing the "development of consumer theory" Suits offers this comparison between the Classical and Keynesian theories.

"The only essential difference between the Keynesian model and the older theory lies in the different restrictions placed on the utility function. Nevertheless there arises a rather subtle change in emphasis, the nature of which has until quite recently been overlooked, and the consequences of which may be far-reaching. Where the older theory concerned itself with the decisions of the spending unit with regard to demand for goods, and the supply of productive services, prices given, the Keynesian model deals almost exclusively with the decision of the spending unit with regard to demand for consumption goods, prices and income being given. Since the Keynesian theory was propounded at a time of extensive unemployment, and was intended to focus its analytic power on this situation, this shift of emphasis passed without comment: Income was only too tragically effective as a constraint on family behavior. We shall argue later that this same assumption is of highly questionable applicability in the period of high postwar prosperity. The difference in the two assumptions has important consequences both for research methodology and for the interpretation of results." Suits, "Determinants of Consumer Expenditure: A Review of Present Knowledge," op.cit., pp.12-13.
of marketing on the consumption function,\footnote{Note however that as a separate issue Suits did consider the possible effects of consumer credit and of consumer credit terms on the consumption function. His view on the matter is summed up in the following paragraph. "In the long run the effect of utilization of consumer credit may be an increase in the proportion of income spent. This might arise from the ease with which certain expenditures can be made. Or the net result may be an increase in saving, as the act of saving to meet repayments lead to a habit of increased thrift, or as the possession of the durables removes the need for expenditures on expensive substitutes, or frees the time of the housewife for outside work, and so on." (\textit{Ibid.}, p.44).} that his review article is still relevant. In his review, Suits emphasized what he calls, "Non-Keynesian modifications" of the theory of consumer behaviour. While the Keynesian theory, and extensions of the Keynesian theory, is based on the notion that "the consumer sector is essentially incapable of acting independently as an economic prime mover," the Non-Keynesian modifications assume "the autonomy of consumer behaviour."

Among the Non-Keynesian modifications surveyed by Suits, Mack's contribution is given full consideration. Suits explains Mack's modification of the Keynesian consumption function in the following way:

The essential features of the consumption function is the role of income as a constraint on, rather than an aspect of, behaviour. In the context of unemployment and depression it is clear that income may usefully be treated as a behavioral constraint: Consumption is limited by the extent to which the spending unit succeeds in marketing its labor services. But, however important this may be during a period of serious unemployment, it is dangerous to consider it a general case. For during periods of prosperity and full employment, many
spending units are free to offer more or less labor services and hence, within limits, to determine their own incomes. The behaviour of the spending unit results in the selection of both a volume of consumption expenditure and a level of income... Moreover there is increasing evidence that even in the relative short run, spending units have considerable choice over their own incomes. There are many vehicles for this behaviour. The wife can take or leave a job, the individual wage earner can work harder, opting for overtime, taking extra pay in lieu of vacation, or even working on more than one job... Finally, the individual is free within limits to select the kind of employment he wants. Since these often differ substantially in income, the choice of occupation involves to some extent a choice of income.50

Contributions from the Recent Macroeconomics Literature.

It is now fairly common for most macroeconomic texts to devote one or more sections to analysing the possible influence of various components of the marketing-mix on aggregate demand. Almost invariably it is implicitly assumed that any such influence of marketing on aggregate demand operates via its effect on the consumption function.

Gardner Ackley's Macroeconomic Theory is an excellent example of the contribution from macroeconomic texts. Ackley's criticism of Keynes' a priori hypothesis about the nature of the consumption function, suggests that his ideas were somewhat similar to those expressed by Mack and Suits. He says that:

It should be noted that the a priori analysis rests on the assumption of a consumer with given tastes, who never learns nor develops, and who lives apart

50. Ibid., pp. 21-23.
from a changing world which continually brings him new goods, new pressures to consume in particular ways, new standards by which to judge the satisfactions to be derived from consumption. It is, and properly should be, an abstract timeless analysis of rational behavior using a minimum of psychological assumptions. As such, it can supply hypotheses, but cannot derive "laws" of behaviour that are valid at any instant of time much less generalizations that can be used to predict or describe behavior which is observed over time in a changing world.51

With regards to the influence of "sales effort" on the consumption function, Ackley summarizes his views in the following way:

The fact that an increase in total consumer demand for one good or class of goods may merely be at the expense of reduced demand for others is sometimes overlooked by those who extoll the virtues of advertising and other selling efforts as a means for increasing aggregate demand. Nevertheless, it is quite possible that an increase or decrease in the amount of selling effort may affect the total volume of consumer expenditures, given the level of income. Reasons for paying little attention to this in the theory of aggregate demand are perhaps, first, that there is no independent measure of the volume of effective selling effort; second, that this volume probably does not fluctuate much in the short run; and, third, that it has not (in the past, at least) been considered subject to social control.52

One component of the marketing-mix which is usually given the most consideration in macroeconomic texts is consumer

52. Ibid., p.268.
credit. Since the development of the "replacement theory" most texts tend to support the view that consumer credit leads to an increase in aggregate demand. For example, Evans says that:

... the "replacement" theory, states that the use of consumer credit does increase purchases of consumer durables over the long run. Different versions of this theory suggest that durables are purchased either at the expense of other consumer items or at the expense of savings. These possibilities are not mutually exclusive, because both substitutions may occur.53

Whereas the replacement theory suggests that consumer credit does increase aggregate consumption in the long-run, the "burden theory" says that since debts have to be repaid, consumer credit cannot increase aggregate demand in the long-run. However, as Evans has correctly pointed out, the repayment hypothesis assumes some preassigned "prudent" limit to the ratio of instalment credit to personal disposable income. Evans is of the opinion that the debt/income ratio of consumers in the United States is below the "equilibrium level."54

The following quote from Siegel supports Evans' position.

The burden theory assumes that the household sector has some maximum debt/income ratio beyond which it is not willing to go. This limit is what is supposed to trigger the downturn in consumer spending some-

54. Ibid., pp.155-156.
time during the boom. If such a limit exists, economists have had a difficult time finding it. Since 1945, the ratio of installment credit to disposable personal income has grown from 2.5 per cent to 14.2 per cent in 1968. This growth has been rather steady, despite some minor fluctuations.55

Keiser's *Macroeconomics* provides another typical example of the treatment of consumer credit in current macroeconomic texts. He says that:

It is of considerable aggregate significance to determine the impact on the levels of consumer durable expenditures and economic activity of future repayment of currently incurred consumer credit. It has often been argued, for example, that repayment of past commitments of consumer installment credit will reduce future purchases of consumer durables. Investigation has shown that this is not the case, however, once one has allowed for the negative impact of the stocks of durables. Enthoven's study has shown that periods of slow increase in debt were associated with slower rates of economic growth. Instead of variations in the consumer debt-income ratio causing "distortions and recessions," the increased use of consumer credit has been associated with a move toward full employment... Installment credit increases aggregate demand because the replacement of durables rises and because installment buying occurs in part at the expense of saving. It appears that individuals with relatively large stocks of durables must replace them more often. If they have financed their original stocks with installment credit, they will go back to the credit market for further financing. Studies have shown, for instance, that consumers with installment debt outstanding had a much greater tendency to use credit than those without it.56


This section would not be complete without reference to a recent survey of consumer economics by Ferber. It was noted above that Ferber's lengthy survey completely ignored the contribution of Mack. However, Ferber did comment on the possible influence of advertising on the consumption function. He says that:

... while much work remains to be done, evidence seems to be accumulating that, whatever its merits, advertising affects consumer behaviour in a variety of ways and at different levels of aggregation. 57

Contributions from Existing Empirical Studies of the Relationship between Marketing and Aggregate Demand.

There have been numerous micro studies of the effect of marketing, and in particular of advertising, on the demand for a particular product. 58 However, there have been very few macro studies of the relationship between marketing and aggregate demand. The earliest work in this area appears to be the relatively unknown study by Yancey. 59

Yancey's study has the merit that it was attempted at a time when data on selling effort was still difficult to come

57. Ferber, op. cit., p. 1318.

58. For example, the classic study by Palda showed that sales of Lydia Pinkham's, the proprietary medicine, were strongly affected by cumulative advertising over the period 1907-60. See K.S. Palda, The Measurement of Cumulative Advertising Effects (Prentice-Hall, 1964).

59. Yancey, op. cit.
by. This partly explains why Yancey used advertising as the only variable to proxy for selling effort.\(^60\)

Yancey suggested that marketing might affect aggregate demand in the following way:

... one may conclude that selling effort and product quality, in addition to price, are of significance in the level and rate of growth of output for firms and through them may affect the economy. These effects occur by affecting the quantity of factor inputs per unit of time for both labor and capital and by changing tastes which can affect aggregate demand...

The effect of price, selling effort, and product quality changes on consumer tastes requires a more complex analysis. The use of these variables by firms is usually thought of as switching product allegiance in order to maximize profits. It seems conceivable that people may, over a period of time, be persuaded to alter their buying habits, not merely from product to product, but from savings to consumption. Consumption depends on wants and tastes for any given level of income and wealth. These wants and tastes are not fixed but are changing as people are informed to a greater degree. Selling effort helps to perform this function of providing information. Thus consumer behaviour can be affected by using selling effort to develop new wants and tastes in new products that are developed.\(^61\)

One of the objectives of Yancey's study was "to measure the impact of selling effort, as represented by advertising, on aggregate demand in the real world." (pp.6-7).

The empirical method used by Yancey is that of examining one function from a model of the economic system "to test

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60. Ibid., p.57.

61. Ibid., pp.3-5. See also pp.56-57.
the hypothesis that selling effort affects the consumption function, and through it the level of activity of the economy." (p.8).

The variable used by Yancey to measure selling effort in his empirical tests was advertising. Yancey admitted that, "advertising is quantitatively only a fraction of the amount spent on selling effort and product quality." (p.57). However, his justification for using advertising was that it was the only variable available to measure selling effort and product quality and that it was highly correlated with the development of new products.

Yancey's data covered the period 1922-1953, omitting the years 1942-1948. Using both ordinary least squares and simultaneous equation methods, Yancey's results led him to conclude that:

Based on the statistical evidence, the application of selling effort and product quality, as represented by advertising, appears to have raised the level of consumption, but better data and estimation techniques better suited to withstand the rigors of errors of observation and autocorrelation in addition to simultaneous relationships, would be useful in testing this hypothesis again.

62. Yancey used both aggregate real advertising expenditures and total of magazine advertising as represented by lines per month. See pp.139-140.
63. Ibid., p.57.
64. Ibid., p.113.
While Yancey was concerned only with estimating the effect of selling effort on aggregate demand via its effect on the consumption function, he was not unaware of other possible impacts of marketing on the economy. For example, with regards to the hypothesis of this thesis that marketing increases the supply of effort, Yancey notes that:

In addition to the impact of advertising on aggregate demand through changing wants for finished goods and services, advertising may have an impact on the supply of labor available for producing output. Advertisements frequently picture individuals using products and services in their leisure time either on vacation or on week-ends and after work. The supply of labor might be decreased as more leisure is desired in order to enjoy the utilization of finished goods if increases in productivity permit real income to be sufficiently high. Another possibility is that the supply of labor might be increased by cutting leisure time if selling effort made the acquisition of goods sufficiently desirable and wage rates were not increased.

Due to the limitations of time and space the examination of the effects of advertising on the supply of factors is not considered in this thesis.\(^{65}\)

Finally, Yancey hinted at the fact that marketing might also be important as a component of aggregate demand. He says that:

The importance of selling effort as a factor cost is indicated by the degree to which final costs of products are made up of marketing costs. Marketing costs constitute about fifty per cent of the final cost of goods and services; and of the total marketing costs, sales promotion costs are about one-

\(^{65}\) Ibid., p.5.
half and physical handling about one-half. 66

A more recent empirical study of the relationship between marketing and aggregate demand is that by Taylor and Weiserbs. 67 The Taylor and Weiserbs study has received much more publicity than Yancey's study, although the latter was a more in-depth study and one which showed more insights into the ways in which marketing affects the economic system.

Taylor and Weiserbs limited their study to estimating the effect of advertising on the aggregate consumption function. Unlike the study by Yancey, advertising was not regarded as a proxy for selling effort. 68 The Taylor and

66. Ibid., p.3.
68. Taylor and Weiserbs, however, seems to have realized the limitations of their effort to isolate the effect of advertising from other components of the marketing-mix. They note in their conclusion that "while the preceding section shows that advertising is not acting as a proxy for the unemployment rate, it nevertheless could be standing as a proxy for something else, a 'new goods' effect perhaps." (p.654). In view of the high correlation between advertising and other components of the marketing-mix, it would be better to regard the Taylor and Weiserbs' study as estimating the effect of marketing on the aggregate consumption function.
Weiserbs' study is much more up to date than that of Yancey. It used data for the period 1929-68, omitting the years 1942-45. Like the study by Yancey, only annual data was used. The framework in which the analysis was carried out was somewhat different from that of Yancey. The method used by Taylor and Weiserbs was that of the Houthakker-Taylor state-adjustment model. Estimation was essentially by ordinary least squares. The results were in agreement with that of Yancey, i.e., that advertising does increase aggregate consumption. Their results yielded a highly significant positive coefficient for advertising. Interpreting the statistical results Taylor and Weiserbs say that:

There is little question but that the results in Tables 1 and 2 are very favourable to the view that advertising has a positive impact on consumption...

Let us now turn to the quantitative importance of advertising in raising the level of consumption. Focusing first on the model with consumption as the dependent variable, we see from (q.1) in Table 2 that a one dollar per capita increase in advertising expenditures is estimated to lead to an increase in per capita consumption of

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70. Two-Stage least squares was only used to check for simultaneous-equation bias due to causality running from sales to advertising.
about $4.55 in the short run and $7.85 in the long run.\(^7\)

**Contributions from the Socio-Economics Literature.**

While the mainstream economics literature can be criticized for not allocating attention to marketing in proportion to its importance in the affluent society, this criticism could hardly be levied against the socio-economics literature. One of the works of Katona has already been referred to in the introductory chapter of this thesis.\(^7\)

Although that study by Katona does not deal directly with marketing, it provides essential insights into the characteristics of an affluent society which makes it easier for the reader to appreciate the importance of marketing in an affluent society.

Katona's *Mass Consumption Society*,\(^7\) while also providing essential background reading relating to the characteristics of an affluent society, comes somewhat closer to recognising the relevance of marketing in the affluent society. Katona, like Mack (*op.cit.*), appreciates the independent influence of the consumption sector in the affluent society. In addition Katona recognizes that consumer credit - one of the components of the marketing-mix - plays a crucial role.

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72. Katona, Strumpel and Zahn, *Aspirations and Affluence*, *op.cit.*

part in the independent behaviour of the consumption sector.

In discussing the "changed role of the consumer sector," Katona says that:

Of the three sectors of the economy - business, government, and consumer - only the first two were recognized as exerting an autonomous influence on economic developments.

Prior to fairly recent major changes in the economy, this may well have been a correct description of economic processes.

One major change which has invalidated traditional economic views, namely, the change in the level and distribution of income, has already been discussed. Added to it in the United States have been changes in the financial reserves of consumers and in the availability of consumer credit.

The possibility of making purchases on credit adds greatly to consumer's discretion of action. It enables them to buy durable goods before they assemble sufficient funds.74

Besides the effect of marketing on consumption demand, this thesis is also concerned with the dynamics of this effect on the rate of growth of the economy via its impact on the demand for rising income and the supply of effort.

With regards to the role of consumer credit in this process, Katona notes that:

The accelerating influence of credit buying must be taken into consideration. In a society in which incomes rise with age, installment buying plays a particularly important role. Were it not for the institution of consumer credit our young people would have been satisfied with a lower standard of living. Arriving at a mature age, they might find that they had accustomed themselves to a simple way of life and might have no use for the things they could then afford...

74. Ibid., pp.17-19.
A rapid increase in the use of installment credit is partly a consequence of a mass consumption society and partly a factor promoting its growth... In Europe, as in America, the expansion of installment credit has contributed to increasing prosperity. As a consequence of the eagerness of European workers to purchase more durable goods and to raise their standard of living their demands for higher incomes likewise rose sharply. It is precisely such developments, leading to the emergence of mass consumption societies, that we hope may one day result in the economic welfare - and ultimately in the political welfare - of more and more nations of the world.75

Katona also considered the relevance of other components of the marketing-mix. For example, on the influence of advertising and market research he made the following comments:

The original function of advertising, and the one in which it is most successful, is to transmit information. The consumer is provided the means of finding out what products are available on the market place. As we have argued, most new products are not created because consumers have expressed a desire for them. The consumer must, therefore, be informed of their existence and of the purposes they serve, as well as of their prices...

Consumer demand is not fixed in quantity. Consumption can be and has been stimulated by salesmanship, marketing, and advertising. But the extent of such influence is far too small to justify the broad statements that are made about advertising's creating our wants. Production and advertising, when in line with prevailing sociopsychological tendencies, do contribute to the actualization of certain wants but are not the creators of the manifold wants that stimulate our mass consumption society. (pp. 58-61).

If consumer's behavior were irrational or if it never changed, because of the enduring power of habits, market and advertising research would be of limited use. The most important single fact that makes market research important in spite of its limi-

75. Ibid., pp. 244-246.
tations is that the consumer is sensible. He is a discriminating person capable of learning and wants to understand what is good for him and why. Putting something over on the consumer or attracting him with false claims might work only for a short time, if it works at all, and with only a few people. Advertising has been described as the process of bringing the consumer from a state of unawareness to that of preferring, liking, and buying a certain product. (pp.294-295).

In the writings in the socio-economics literature of the effects of marketing in our affluent society, perhaps the most popular and controversial figure is that of John Kenneth Galbraith. Since this thesis is not concerned with the moral, cultural, or welfare effects of marketing, Professor Galbraith's writings are only relevant to the extent that it discusses objectively the influence of marketing on the level and growth of economic activity in the affluent society.

The two important observations which Galbraith makes in American Capitalism, are that marketing absorbs a substantial part of the national product of the United States, and that this relatively large size of the marketing sector is directly attributable to the relative affluence of the United States in the post-war period.76

In the Affluent Society, Galbraith developed the idea of the "dependence effect" which has become popular since. He suggested that consumer wants are largely created by the production and marketing processes via their attempt to satisfy

Insofar as the over-all philosophy of this thesis is to emphasize the crucially important role of marketing in the development and maintenance of an affluent society such as the post-war United States, the work by Baran and Sweezy is probably the most relevant previous contribution in the socio-economics literature.  

The basic observation of Baran and Sweezy is that as a Capitalist economy develops it moves away from a system of perfectly competitive markets to a system which Baran and Sweezy calls Monopoly Capitalism. The characteristic feature of monopoly capitalism is that of giant corporations being the typical form of business organisation. This type of economic organisation leads to a continuous decline in the costs of production and a consequent increase in economic surplus. Unless the capitalist system can find some way of absorbing this continuously increasing surplus, full employment cannot be maintained. The important observation by Baran and Sweezy, from the point of view of this thesis, is that under Monopoly Capitalism, an increasing proportion of


78. Baran and Sweezy, op.cit.

79. Since the motivation of cost reduction is to increase profits, declining costs imply continuously widening profit margins. Surplus tends to rise both absolutely and relatively. (Ibid., pp.71-72).
economic surplus is absorbed by the sales effort.

Since surplus tends to rise as a proportion of income, and capitalist's consumption as a proportion of surplus declines, an increasing proportion of surplus needs to be absorbed by investment, if capitalist consumption and investment are the only means of absorbing surplus. "What this implies, however, is nonsensical from an economic standpoint. It means that a larger and larger volume of producer goods would have to be turned out for the sole purpose of producing a still larger volume of producer goods in the future." 81

Baran and Sweezy note that monopoly capitalism suffers from a chronic inability to absorb as much surplus as it is capable of producing. The result is that the stimulation of demand - the creation and expansion of markets - thus becomes to an ever greater degree the leitmotif of business and government policies under monopoly capitalism. Furthermore, because price competition as a means of expanding demand is largely ruled out under monopoly capitalism, every giant corporation is driven by the logic of its situation to devote more and more attention and resources to the sales effort. 82

80. This is deduced from the fact that distributed profits as a proportion of total profits declines as a company grows. (Ibid., p.80).

81. Ibid.p.81.

82. Ibid., pp.109-111.
With the tendency for surplus to rise and traditional modes of surplus absorption being increasingly inadequate, an increasing volume of sales effort becomes a life-and-death issue for the system. And as the sales effort grows relative to capitalists' consumption and accumulation, it increasingly dominates the composition of social output, the rate of economic growth, and the quality of society itself. 83

It is clear that Baran and Sweezy support two of the main hypotheses of this thesis, i.e., that marketing affects the level of aggregate demand directly, since it is an important component of aggregate demand, and indirectly, by increasing the level of aggregate consumption. With regards to the first hypothesis they note that:

For the economic importance of advertising lies not primarily in its causing a reallocation of consumer's expenditures among different commodities but in its effect on the magnitude of aggregate effective demand and thus on the level of income and employment. This has been readily grasped by professors of marketing and advertising as well as by business journalists, but with few exceptions it has been ignored by economic theorists. 84

With regards to the second hypothesis they state clearly that:

The function of advertising, perhaps its dominant function today, thus becomes that of waging, a

83. Ibid., p.114.
84. Ibid., p.124.
Contributions from the Marketing Literature.

While the marketing literature pays relatively little attention to macroeconomic relationships, most writers in the marketing literature implicitly assume that marketing activity has macroeconomic implications. Indeed, the introduction to a typical text in marketing tends to confirm the point of view of Baran and Sweezy that writers in the business field are much more aware than economists, of the role of marketing in the expansion of aggregate demand. 86

For example, Paul D. Converse, writing on the history of marketing thought in the United States notes that as far back as the 1880's, David A. Wells had expressed the following ideas:

The long run trend was for real wages to increase, and, through marketing processes, consumer income and demand were expanded. Wells felt that marketing makes the economy dynamic, puts the product of technological progress into the hands of the consumers, and contributes substantially to the progress of civilization...

Wells was getting close to saying that marketing activities increase demand (income) by making people work harder or more intelligently to secure the purchasing power with which to buy the things they

85. Ibid., p.128.
86. Ibid., pp.123-124.
In another history of marketing text, Bartels notes that:

As study began to yield knowledge of marketing, certain established concepts of the market needed to be re-examined.

One was the idea that demand originates in the creation of supply. This concept had grown out of economic situations simpler than those existing in 1900...

By 1900, however, it was being found that demand consisted of more than simple purchasing power. It reflected desire as well as ability to purchase, and new experiences with advertising and salesmanship were proving that desire could be increased and molded by factors other than the mere existence of supply. Such a concept of demand was not found in prevailing economic theory because, until that time, incomes had not been to any great extent sufficiently above subsistence levels to permit men to be subject to "demand-creating" influences.

As further support for the observation that writers in the marketing field implicitly assume a direct positive relationship between the level and growth of marketing and the

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87. Paul D. Converse, *The Beginning of Marketing Thought in the United States* (University of Texas, 1959), pp.6-7. Moriarty also gave a new interpretation of Say's Law, i.e., that it was meant to suggest to businessmen that there could be no overproduction as long as they paid as much attention to marketing as they did to production. See W.D. Moriarty, *The Economics of Marketing and Advertising* (Harper and Bros., 1923), chapter 10.

level and growth of macroeconomic activity, the following quotes have been taken from some basic texts in marketing, selected at random.

Let us hope that the second half of this century, 1950-2000, will deserve the label "Age of Marketing" as rightly as the 1900-1950 decades are entitled to be known as the "Age of Production." Distribution is the major element in our economy today. Our production has outrun our marketing; our ability to supply exceeds our demand; our big job is to sell the output of our huge productive facilities. We must look to selling to close the gap between our growing capacity to produce and our demand. 89

Indeed a fundamental task of a marketing system is to assist in the process of maintaining private aggregate consumption at desirable levels. Marketing is an important means of producing cultural change; it is an important means for increasing both levels and standards of living. Nor is this role an evil role. It appears that modern capitalism in a mature state of development is inherently beset with problems of unemployment. It is an undeniable fact that changing levels of aspiration are as important as any other single factor in maintaining tolerable levels of unemployment in such a modern economy. 90

The total expenditure for advertising in the United States may more than double by the end of the next decade compared with the estimated $15 billion for 1965. This could be the essential ingredient in sufficiently increasing consumer demands to provide markets necessary for the trillion-dollar productive ability expected by 1975-76. 91


A brief comparison of the American economy with economies found elsewhere in the world further demonstrates the importance of marketing. The type of economy we have largely explains why marketing as we know it is so much an American phenomenon, both in practice and as a field of study. Ours is not a raw-materials, "underdeveloped" economy, nor is it any longer a subsistence economy. It is not an economy of state capitalism, as is found in Russia, nor is it similar to the Western European economy of cartels and small shopkeepers. It most certainly is not the static, perfectly competitive economy of classical economic theory. Instead, ours is an economy of abundance. This means that as a nation we produce far beyond our subsistence needs. We have an adequate national disposable income and considerable discretionary purchasing power. We are under no necessary compulsion to consume all that is produced, but unless we do, a severe economic decline will set in. While marketing exists in every type of modern economy, it is an especially important foundation stone for successful business performance in a highly competitive economy of abundance.

American marketing activity has the task of encouraging the consumption of the vast output of goods and services of American business and industry. In a period of less than full employment, advertising can be used in several ways to alleviate the situation. First, if persons can be persuaded to increase the propensity to consume, it follows that there will be greater employment of resources. Second, advertising can be used to inform people and stimulate a desire for new inventions. Third, proponents of this theory hold that no economic resources should be left unemployed for unused resources are lost. It is argued, therefore, that even resources that are relatively unproductive should be put to work, for they produce income and help the economy.


In an economy as wealthy as our own, less than half of the consumer's dollar is spent on food, clothing, and shelter. While poor countries concern themselves with producing enough to provide the bare necessities of life for their people, business in our country devotes a great deal of its energy to stimulating consumer demand for things that the consumer could get along without, and in some instances would not have thought about were no effort made to whet his appetite... As we will learn in Chapter 12, a mature capitalist economy must at various times stimulate consumer demand in order to avoid a depression. This stimulus to consumer demand can come from government; it can also come from business. Advertising is business' way of stimulating consumer demand...

Consumer credit allows the consumer to expand his consumption without gearing his buying strictly to his savings or income. In a mature economy like our own, demand creation is important. It is doubtful, though, whether demand could be expanded without consumer credit.

2.3 INDICES OF MARKETING ACTIVITY.

Marketing activity as defined in this thesis includes all expenditures on the promotion of consumer products as opposed to production and distribution costs. As noted earlier, this definition of marketing costs is narrower than the definition of marketing in the marketing literature, where marketing costs is defined to include both expenditures on physical distribution and on promotion. However, the problem which the researcher faces in attempting to estimate the impact of marketing expenditure on the economy, is that such expenditure, whether defined to include or exclude costs of distribution, is not separated out in the National Income Accounts, as are the other components of aggregate demand - consumption, investment.

The separation of aggregate marketing expenditures from the other components of aggregate expenditures is obviously an essential prerequisite to the empirical testing of a macroeconomic model which treats marketing as a separate sector.

The researcher, however, faces the further problem that there are no estimates available, on a continuing basis, of the total cost or monetary value of aggregate marketing expenditure. Even the estimates that have been made for par-

95. Baran and Sweezy have suggested that one reason why economists have neglected to investigate the role of the sales effort in the maintenance of aggregate demand is the way in which business accounting tend to treat the costs of the sales effort as part of the costs of production and distribution. This would also explain why there has been no attempt in the National Income Accounts to treat expenditures on marketing as a separate component of aggregate demand rather than as an integral part of total consumption expenditures. See Baran and Sweezy op.cit., pp.124-125.

96. "Although special surveys of the advertising costs in individual countries have commanded great, national as well as international, interest in recent years, the determination of the total marketing costs in the individual society seems an even more important task... Both on account of the decisive importance of the marketing task in modern societies and of the heavily increasing influence of this task on the national structure of costs, the determination of the total amount and distribution of marketing costs must be a problem of first importance to the national economy as well as to the individual business firm. It is hard to understand why business firms in industrialized societies have not urgently required that such investigations should be made, and why international economic research has not attacked the task with enthusiasm and on a broad front. To the best of our knowledge, the only investigations that have been made so far are the American study of 1939 and the Danish study for 1953." Max Kjaer-Hansen, Cost Problems in Marketing (Amsterdam: North-Holland Publishing Company, 1965), p.24. The American study to which Kjaer-Hansen refers is Paul W. Stewart and J. Frederick Dewhurst, Does Distribution Cost Too Much? (Twentieth Century Fund, 1939).
ticular years suffer from two major defects. The first is that since these estimates have been done by researchers in the marketing field, no attempt was made to separate distribution costs from marketing costs as defined in this thesis. The figures in these studies are therefore estimates of marketing costs including distribution costs.

The second defect of these estimates is that their accuracy is highly questionable. For example, the classic study of marketing costs in the American economy by Stewart and Dewhurst summarizes the problems involved in estimating the costs of marketing in the following way:

How much of the $65.6 billion paid for finished goods in 1929 represented costs of distribution rather than production? This question cannot be answered with any degree of precision in view of the lack of comprehensive data. An attempt to answer it involves analysis of a multitude of public and private reports and statistics and necessitates arbitrary decisions as to what are or are not "commodities: and as to where production stops and distribution begins. Any estimate of the total cost of distribution, therefore, must be a rough approximation.

97. The one exception is the study by Kjaer-Hansen for Denmark. Kjaer-Hansen made a point of emphasizing the need to separate total marketing expenditures into expenditures on promotional activities and expenditures on physical distribution. See Kjaer-Hansen, op.cit., p.41.


99. Stewart and Dewhurst, op.cit., p.117.
The above study estimated marketing costs including the cost of distribution, as 59 percent of the total cost of producing and distributing commodities. Later studies suggested that Stewart and Dewhurst overestimated the costs of marketing and that the figure is closer to 52 percent of the total value added by production and marketing.

Several other studies have estimated the total costs of marketing. In view of what has been said above, these estimates must be regarded as rough approximations and only intended to give an idea of the percentage of the consumer dollar which goes to marketing activities.

Given the lack of available data on aggregate marketing expenditures, the researcher is forced to use indices of marketing activity in his empirical tests. The remainder of

100. Ibid., p.117.

101. See for example, Paul D. Converse, "Marketing Costs Have not Increased in 40 years," in Readings in Marketing, op.cit., p.10.

102. "It is a significant economic fact that nearly fifty cents of every dollar we spend as final consumers goes ultimately to compensate someone engaged in marketing activities," Gist, op.cit., p.28. This is the accepted estimate of marketing costs in the typical text on marketing. It derives from the fact that most estimates of marketing costs have come up with a figure of between 50 and 52 cents in the dollar. See for example Paul D. Converse and Harvey W. Huegy, The Elements of Marketing (3rd revised ed.; Prentice-Hall, 1946), pp.4-5; Reavis Cox, Distribution in a High-Level Economy (Prentice-Hall, 1965), chapters 8, 9 and 10; Stanley Hollander, "Measuring the Cost and Value of Marketing," Reprinted in Marketing and the Behavioral Sciences, op.cit., pp.493-512.
this chapter discusses the indices of marketing activity used in the empirical tests in this thesis and relates these indices to those used in the existing literature.

Advertising.

Advertising is perhaps the oldest and most widely used index of marketing activity. Long before any attempt was made to estimate statistically the effect of marketing on other macroeconomic variables, the term advertising was used as a generic term for all forms of selling effort or promotional activities. For example, it was noted earlier in this chapter\textsuperscript{103} that both Marshall and Pigou used the term advertisement to refer to selling effort or promotion in general. This practice has been followed by many later economists, writing on marketing.\textsuperscript{104} It has therefore become common in the economics profession to regard an analysis of advertising as being equally applicable to an analysis of other components of selling effort. Furthermore, the marketing literature has in recent years, emphasized the complementary nature of various components of the marketing-mix. In particular it is pointed out that new products require the support of the advertising and credit departments to be successfully launched, that a sales force without credit facilities is virtually impotent and that adver-

\textsuperscript{103} See p.53, n.14.

\textsuperscript{104} See for example, Chamberlin, \textit{op.cit.}, 1962, p.118 and Braithwaite, \textit{op.cit.}
tising makes the work of the sales force much easier.

The complementary nature of the components of the marketing-mix imply fairly high correlation among these components, over time. This would justify the use of advertising as an index of marketing in any empirical study. This was indeed the justification given by Yancey for his use of advertising as the index of "selling effort and product quality" in his empirical investigation of the effect of marketing on the aggregate consumption function.

The only other empirical study of the relationship between marketing and aggregate consumption also used advertising as the index of marketing. Since advertising is the most popular index of marketing among economists, it is one of the indices used in this thesis. There are, of course, several measures of advertising, and it is not clear which of these measures of the advertising variable best indicates the impact of advertising on sales. However, both of the previous empirical studies of the effect of advertising on aggregate consumption have used aggregate advertising expenditures as the measure of advertising. This measure has two advantages. The first is that annual data on aggregate advertising ex-

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105. See Yancey, op.cit., p.57.

106. See Taylor and Weiserbs, op.cit. It was noted earlier in this chapter (p.90) that Taylor and Weiserbs did not explicitly recognize advertising as an index of marketing.
penditures is readily available. The second advantage is that a monetary measure of the advertising variable allows us to estimate the size of the multipliers associated with a change in income due to a change in marketing expenditures. These are some of the reasons for using aggregate advertising expenditures as the measure of advertising in this thesis.

Consumer Credit.

Consumer credit is another component of the marketing-mix which would be a good candidate as and index of marketing activity. However, unlike advertising, there has been no previous attempt to use consumer credit as an index of marketing activity. The reason seems to be that whereas in the marketing literature, consumer credit is one component of the marketing-mix similar to advertising, consumer credit is treated somewhat differently from advertising, in the economics literature. In particular, economists tend to analyse consumer credit by way of financial or monetary considerations rather than by way of marketing considerations.  

107. Typically, the traditional analysis is concerned with changes in consumer credit terms, finance charges and repayment periods on aggregate consumer demand. In the present study such changes are reflected in the composite index of marketing which is used. It is reasonable to suppose that during a period of "tight" credit other components of the marketing-mix will be substituted for credit thus offsetting some of the fall in aggregate demand attributable to the credit squeeze. Such substitutions will be reflected by the composite index of marketing.
From the point of view of this thesis, consumer credit is another component of the marketing-mix which complements other components, just as advertising does. There is therefore no reason to treat it differently from advertising.\textsuperscript{108}

Like advertising, there are several ways of measuring consumer credit. These include the volume of new credit injected into the economy (extensions), the net change in credit (extensions less repayments), and the total amount of credit in existence at a given point in time (consumer credit balances out-

\textsuperscript{108.} There is a problem in treating consumer credit in this way. Consumer credit is provided not only by retail outlets as part of their marketing package but also by commercial banks and other financial intermediaries. An argument can therefore be made that a marketing index which includes consumer credit provided by commercial banks captures some of the effect of monetary policy. While this cannot be denied there are strong arguments for including total consumer credit as part of the marketing index. In the first place a large part of the consumer credit provided by the seller is financed indirectly by commercial banks and finance companies. Secondly, commercial banks often provide credit which are tied to the purchase of consumer durables, especially automobiles. Often consumers are encouraged by commercial banks to re-finance several individual purchases previously financed by retail outlets with a single bank loan. Thirdly, retail outlets sometimes "arrange" loans on individual purchases for the consumer with commercial banks.

In general the links between sellers and financial institutions are extremely close - witness the recent rise in the use of bank charge cards as a possible substitute for the traditional revolving charge accounts provided by the large departmental stores. Although the market in consumer credit is not perfect there is keen competition. The commercial banks entered this field in the first place because they felt their position threatened by the prosperity of the sales finance and consumer loan associations. A tight monetary policy imposed on the commercial banks is therefore likely to filter down to the other financial institutions and the commodity dealers. As mentioned in the previous footnote this will be reflected in the composite marketing index. To consider only consumer credit provided directly by commodity dealers as part of marketing is to ignore the interconnections of the consumer credit market.
standing). Since there has been no previous comparable study in this area, there is no existing empirical support for the use of one measure rather than another. Intuitively, since the present study is a relatively long-run one covering the entire post-war period, the balances outstanding measure should provide the best index. Extensions and repayments are likely to be good measures of the cyclical impact of consumer credit on economic activity, but it is balances outstanding which provides a good measure of the consumer's willingness to increase his debt over the long-run in an attempt to raise his consumption standards.109

In the empirical tests all three measures have been experimented with. The results are fairly close. This is to be expected since all three measures have shown similar variations in the post-war period. However, the empirical results do tend to favour the balances outstanding measure. Therefore, from both the theoretical and empirical points of view, it was decided to use the balances outstanding measure as the basic measure of consumer credit in the present study.

Product Innovation.

Product innovation includes the research and development of new products, modifications of existing products, changes in quality, design and packaging.

In the macroeconomics literature, the analysis of the introduction of new products and quality changes has been closer to

109. This measure is also suggested by the "burden theory" which implicitly assumes some maximum debt/income ratio in the long-run.
the analysis of advertising than to the analysis of consumer credit. The economics literature has implicitly recognized product innovation as part of the marketing package.

As an important component of the marketing-mix, product innovation provides another possible index of marketing activity. However, as in the case of advertising and consumer credit, there are several choices as to the appropriate measure of product innovation.

Consumer needs which are determined by market research are translated into new product ideas by the R&D departments of business firms. The objective of industrial R&D expenditures is to supply a continuous stream of new products to replace existing products.\textsuperscript{110} The importance of industrial research and development in the creation of new products is well summarized in the following:

The need to develop new or improved products to serve expanding domestic and foreign markets, to meet competition from other Canadian and foreign firms and to exploit efficiently the country's natural resources has required industry to form and expand competent research and development units.\textsuperscript{111}

\textsuperscript{110} A study by Goodman suggests that the average life of a new product is three years. See S.R. Goodman, "Using Decision Guides for Research and Development," \textit{Food Technol.}, Vol. 24, No. 4 (1970), pp.42-47. Elling notes that during the 1960's about one half of all sales receipts originated from the marketing of products which were less than ten years old and that during the 1970's about 75 percent of all sales will be from such new products. Karl A. Elling, \textit{Introduction to Modern Marketing: An Applied Approach} (Macmillan, 1969), pp.203-206.

\textsuperscript{111} \textit{Canada Year Book 1970-71}, D.B.S. publication, p.500.
Industrial R&D expenditures, therefore, provides a reasonably accurate measure of product innovation. Since this is a monetary measure of product innovation it has the advantage suggested above with regards to advertising expenditure, that it enables the estimation of the size of multipliers associated with a change in income due to a change in marketing expenditures.

Funds for the performance of industrial research and development, which includes funds provided by the Federal Government to assist in industrial research are estimated and published annually by the U.S. Department of Commerce. There are therefore no data limitations on the use of this measure of product innovation.

There are two other possible candidates for measuring product innovation. These are patents and trademarks, respectively. Both patents and trademarks are useful legal devices used by firms as an integral part of their product development program.

Janet Berry describes the importance of patents in the development of new products in the following way:

There is always a high risk factor in new product research. It is also true that the industrial-or commercial-minded inventor is today peculiarly dependent on the protection of issued patents. The lack of or lessening of such protection would immediately act to reduce the return on the dollars spent.

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112. "Expenditures for research and development are assumed to be a reasonable indication of new-product effort." (Stanton, op.cit., p.189).

113. These present some further possible choices in that in both cases, there is the option of usion only new issues or total issues including renewals.
for the discovery of new products and thereby tend to
discourage the spending of money for all research.

In order to protect a new product during its de-
velopment and early production periods, there are only
two avenues of approach available. These are to treat
it either as a "trade secret" or, if all or a part of
it qualifies, as a patentable invention...

Today, a majority of large corporations follow the
policy which recognizes that advantages to themselves
and to the public are to be gained by seeking patent
protection for new products wherever possible. Patents
provide legal protection, and the only legal protection
available for the results of expensive research...
The result of all this is that in recent years re-
search has been turning out an increasingly large num-
ber of new materials, new products, new tools, and new
ways of doing already known things. Some are already
in the market place; many more are yet to come. Today,
many American companies are earning 80 to 90 per cent of
their profits from new products which were not even
manufactured ten years ago. New products have actually
caused or spurred the growth of whole new industries.
Such a technological and commercial development must,
in large part, be the result of research and development
and the incentives provided by the patent system for
the investment of time and effort. It is no accident,
surely, that the greater number of inventions and dis-
coveries have originated in countries with a sound and
respected patent system.114

While patents is a protective device which acts as an incen-
tive to new product development, the idea of a "brand" name is
more of a selling device. A brand is defined as "a name, term,
symbol, or design, or a combination of them which is intended to
identify the goods or services of one seller or group of sellers
and to differentiate them from those of competitors.115

114. E. Janet Berry, "Patents and Their Importance in the New
Product Effort," in New Products: New Profits, ed. by
Elizabeth Marting (American Management Association, 1964),
pp.96-98.

115. Committee on Definitions, Marketing Definitions: A Glossary
of Marketing Terms (American Marketing Association, 1960),
p.8.
Stanton has identified four areas in which the use of brand names enhances a firm's sales program. Thus branding serves as an aid in advertising and display programs, helps to increase control and share of market, reduces price comparisons and help stabilize prices, and facilitates expansion of the product mix.\textsuperscript{116}

A trademark is a legal device which safeguards the exclusive use of a brand name by a single seller. "It is often said that a well-known and favourably regarded brand name is a company's most valuable asset. If this is true, such an asset should be carefully protected. One means of protecting a brand is to register the brand under the Federal trade-mark law."\textsuperscript{117}

Industrial R&D expenditures, patents issued, and trademarks registered, are three measures of product innovation which have been used in the empirical tests done in this thesis. Since R&D expenditures is the only monetary measure, this measure has been used more extensively than the other two. The empirical results also favour the R&D measure over the other two measures.

\textbf{A Combined Index of Marketing.}

Advertising, consumer credit, and R&D expenditures are three components of the marketing-mix which are primarily complementary rather than competitive. As such a good case can be made for using anyone of these components as an independent index of mar-

\textsuperscript{116} Stanton, op.cit., pp.241-242.

keting. However, there are several reasons why a combination of these three components is likely to provide a better index of marketing than each of these components, separately. These reasons follow from the fact that tests which use a single component as the index of marketing cannot capture the effect of substitutions between components of the marketing-mix.\textsuperscript{118}

The period of observation covered by the empirical tests in this thesis is the entire post-war period. Since this is a period of rapid growth and change, it is very likely that substitutions have taken place between components of the marketing-mix. For example, it is becoming increasingly common for wholesalers to advertise and sell directly from warehouses, thus substituting advertising expenditures for retail outlets.

If we assume that businessmen are profit maximizers, any change in the relative prices of components of the marketing-mix would induce substitutions among these components. In addition, any change in technology, custom, or institutional arrangements which makes one component relatively more effective, would cause substitutions. One example of technological change in the post-war period is the introduction of television. An example of institutional change is the increased willingness of commercial banks to extend consumer credit and their extension of the maximum repayment period from two to three years.

\textsuperscript{118} Analogously, since labour and capital are complementary factors in an aggregate production function, a reasonably good estimate of the aggregate production function will be obtained if only one input is used as the independent variable. However, this test would be invalid if during the period of observation, there was substitution between labour and capital due to changes in relative factor prices and technological changes.
If there are substitutions among components of the marketing-mix, a combined index of marketing would provide a better index than an index based on a single component of the marketing-mix. It is for this reason, that in the present thesis, consumer credit and product innovation are not used as independent indices of marketing, but only in combination with advertising.\textsuperscript{119} Advertising is used as a separate independent index, in addition to being used in combination with consumer credit and product innovation, so that the empirical results can be compared both with previous empirical tests and with the combined index used in the present thesis.

One way of arriving at a combined index of marketing is to add up the expenditures on advertising, consumer credit and product innovation. In the cases of advertising and product innovation, this means adding up aggregate advertising expenditures and R\&D expenditures.\textsuperscript{120} In the case of consumer credit, what is required is some estimate of the cost of providing consumer credit. Since the consumer pays interest on his outstanding credit, one way of estimating the cost of consumer credit is to multiply

\textsuperscript{119} This argument suggests that the ideal index is total marketing expenditures as defined in this thesis. However, expenditures on several components of the marketing-mix - expenditures on salesmen, market research, sales promotion, packaging and publicity - are not available.

\textsuperscript{120} This is another advantage in using a monetary measure of these components of the marketing-mix as opposed to other possible measures suggested above.
consumer credit balances outstanding by some average rate of interest.\textsuperscript{121} The average rate of interest used in this thesis is 15 percent.\textsuperscript{122}

A Principal Components Index of Marketing.

Another way of combining the three indexes of marketing - advertising, consumer credit, and product innovation - into a single index, is through the method of principal components analysis. Principal components analysis provides a useful technique for reducing the dimension of a problem.\textsuperscript{123} In the present context, the

\textsuperscript{121} One possible complication in using this method is that while rates of interest charged by financial institutions - commercial banks, credit unions, finance companies - are likely to reflect the cost of providing consumer credit, the rates charged by sellers who provide their own credit, need not. This is because part of the cost of providing consumer credit by sellers can be absorbed as marketing costs. However, a comparison of interest rates charged by various lending institutions including sellers, tend to suggest that sellers do not subsidize their credit departments by charging an interest rate less than that required to cover the cost of providing credit. The rationale seems to be that consumers are more concerned about the availability of a credit service, than the cost of the credit.

\textsuperscript{122} See p.37, n.46, of this thesis for some comments on this estimate. For some problems involved in estimating the cost of consumer credit see Paul F. Smith, Consumer Credit Costs 1949-59 (Princeton University Press, 1964), pp.1-5.

\textsuperscript{123} In suggesting possible applications of principal components theory, Dhrymes says, "Finally, there is the general problem of aggregation, or index construction. Here again the nature of the problem is the representation of m-dimensional vectors in a space of fewer dimensions - typically one." P.J. Dhrymes, Econometrics: Statistical Foundations and Applications (Harper and Row, 1970), p.53.
problem is one of regressing dependent variables such as aggregate consumption, aggregate labour supply, and the change in money wage rates, on the independent variable, marketing. The proxies for marketing are three components of the marketing-mix - advertising, consumer credit, and product innovation. Because of possible substitutions among these components, no single component can serve as an adequate index of marketing. At the same time, the complementary nature of all components of the marketing-mix suggests that the three proxies will be highly correlated. Therefore, if the three proxies are used as three independent variables in a single regression equation, the problem of multicollinearity would lead us to question the reliability of the results. However, a principal components analysis of the three original variables - advertising, consumer credit, and product innovation - will reduce the dimension of the index from three to one. This single index of marketing can then be used in the regression analysis.

Let us denote the original variables by the following symbols:

- $A = \text{advertising}$
- $R = \text{consumer credit}$
- $Q = \text{product innovation}$

The principal component $M$ is a linear combination of the original variables, $A$, $R$ and $Q$, such that $M$ in some sense has maximum
possible variance. The combined index of marketing provided by the method of principal components analysis has the advantage, over the previously suggested combined index, that it is not limited to mone-

124 Strictly speaking \( M \) is the first principal component. The first principal component is the principal component which individually explains more of the variability of the original variables than any of the other principal components. Let \( X \) be the matrix of original variables. Then the number of different linear combinations - principal components - of the original variables is determined by the rank of \( X \). In the present case, if the original variables are not perfectly collinear, \( X \) will be of full rank, and there will be three principal components. The original \( X \) matrix can therefore be replaced by three new variables which are pairwise, uncorrelated. However, the objective of principal components analysis is not simply to remove the problem of multicollinearity, but to reduce the dimension of the independent variables. This is possible where a small number of principal components account for a large proportion of the total variation of the original variables. In the present case, the first principal component accounts for between 93 percent and 99 percent of the total variability of the original variables depending on which measures of advertising, consumer credit and product innovation, are used as original variables. It is therefore justifiable to replace the original variables by a single principal component.


The principal components used in this thesis were computed originally by using the program S.F.U. Factor which was available at the S.F.U. Computing Centre. This program is based on D.J. Veldman's, *Fortran Programming for the Behavioral Sciences* (Holt, Rinehart and Winston, 1967), chapter 9. S.F.U. Computing Centre has recently discontinued the use of S.F.U. Factor, but has replaced it with a similar program BMD08M - Factor Analysis. The BMD program was used in subsequent analysis.
tary measures. With regards to consumer credit, therefore, it is not necessary to use the estimated cost of consumer credit. Consumer credit balances outstanding, consumer credit extended, and the net increase in consumer credit, can be used as measures of consumer credit. Similarly, with regards to product innovation, all three measures suggested above - R&D expenditures, patents issued, trademarks issued - can be experimented with. All these different measures were therefore experimented with.

**Symbols Used for the three Final Indices of Marketing.**

The final indices used in the empirical tests are denoted by the following symbols:

\[ \begin{align*}
A &= \text{Advertising expenditures. In this case the index of marketing is aggregate advertising expenditures.} \\
M_e &= \text{Marketing expenditures. In this case the index of marketing is the sum of aggregate advertising expenditures, R&D expenditures, and the estimated cost of consumer credit.} \\
M_p &= \text{Principal components index. There are several principal components indices, depending on the original variables used. For example, if the original variables are advertising expenditures, consumer credit balances outstanding, and trademarks issued, the principal components index is denoted by } M_{AR}T, \text{ where } A = \text{advertising expenditures, } R = \text{consumer credit balances outstanding, } T = \text{trademarks issued. If installment credit extended is used as the measure of consumer credit, the principal components index is denoted by } M_{AR}T, \text{ where } R_e = \text{installment credit extended.}
\end{align*} \]
CHAPTER III

MARKETING ACTIVITY, THE LEVEL OF INCOME, AND THE RATE OF GROWTH.

Two basic types of models are developed to analyse the effect of marketing activity on the level of income, and the rate of growth, respectively. These models provide the framework for the empirical tests carried out in chapters 4, 5, and 6. Chapter 4 tests the hypothesis that marketing increases the level of income by increasing aggregate demand. Chapters 5 and 6 test the hypothesis that marketing increases the rate of growth of income by increasing the supply and efficiency of labour.

The effect of marketing activity on the equilibrium level of income is analysed within the framework of the static Keynesian model. The effect of marketing activity on the rate of growth is analysed within the framework of the Harrod-Domar model.

Marketing Activity Defined.

Expenditures on marketing are directed at two distinct functions. Physical handling or distribution is the traditional function of marketing and has long been recognised by economists as an important sector of the economy. The more recent function of marketing is promotion. This latter function of marketing has not yet been given extensive recognition in the economics discipline. However, during the enormous expansion in consumer demand in the post-war period attention has been focused on the promotional aspects of marketing. In this thesis marketing is defined to include only expenditures on promotion. These ex-
penditures are different from expenditures on production and distribution in that while costs of production and distribution affect the supply of output, marketing costs affect the demand for output.\(^1\) At the aggregate level, this means that the level of aggregate demand is not independent of the level of marketing.

PART I

MARKETING ACTIVITY IN A STATIC KEYNESIAN MODEL.

The crucial assumption which distinguishes the static Keynesian model from the Harrod-Domar growth model is that in the former the stock of capital is fixed. This assumption fixes the capacity or full employment level of output of the system. An equilibrium is defined in terms of the product market. This is the condition that aggregate demand equals aggregate supply. As long as there is no exogenous change in aggregate demand the system maintains a constant flow of income. An exogenous increase in aggregate demand which is maintained at the new level, increases the level of income permanently. Such increases can continue until the full employment state is reached. The system, however, has no dynamism in the sense that all increases in income are once for all increases.

\(^1\) This important distinction between marketing costs and production and distribution costs, though largely ignored by economists, was made by Chamberlin in his Theory of Monopolistic Competition. See earlier reference to Chamberlin's work on p.56 of this thesis. Marketing also affects the potential supply of output by increasing the supply of labour.
Sectors of the Model.

The sectors into which a model is divided are normally determined by the level of aggregation which is necessary for the particular analysis. In the most highly aggregated Keynesian models, four sectors are usually distinguished. These are the consumption goods sector, the investment goods sector, the foreign sector, and the government sector. To simplify the analysis the foreign sector is ignored by assuming a closed economy. The behaviour of the government sector is assumed to be exogenous.

The Product Market.

Keynesian models traditionally have four markets. While marketing activity, especially consumer credit, is likely to have some impact on the money and bond markets, these markets are not considered in this thesis. Within the context of the static Keynesian model the effect of marketing activity on the supply of factors is ignored. The product market of the static Keynesian model can be represented by the following set of linear equations.

1. \[ C = a_0 + a_1 Y_d = a_0 + a_1 (Y - T - D) \]
2. \[ I = I^0 \]
3. \[ G = G^0 \]
4. \[ T = T^0 \]
5. \[ D = D^0 \]
6. \[ Y = C + I + G \]

\[ 0 < a_1 < 1 \]
where \( C \) is aggregate real consumption expenditures.

\( Y \) is gross national product.

\( I \) is real gross private investment.

\( G \) is total government expenditures.

\( T \) is tax receipts net of transfer payments.

\( D \) is the estimated value of capital consumption.

**Assumptions.**

The following simplifying assumptions have been made. The consumption function relates aggregate consumption only to disposable income. This can be regarded as the short-run consumption function specified by Keynes. Capital consumption is valued at replacement rather than historical costs and there are no undistributed profits. \(^2\) This means that \( Y_d = Y - T - D \). Total investment expenditure is autonomous. There is no income tax, only a poll tax which is exogenously given.

**Marketing as a Component of Aggregate Demand.**

Marketing activity constitutes an important and growing component of aggregate demand in the affluent society. Since National Income Statistics do not separate out the contribution

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\(^2\) An alternative assumption would be that consumers treat undistributed profits like any other form of income in which case \( Y_d \) can be defined to include undistributed profits.
of this component of aggregate demand, it is difficult to make comparisons. However, table 1.2, p.39 of this thesis, shows that expenditures on three components of the marketing-mix increased from 10.7 billion (1958 dollars) in 1947 to 46.3 billion (1958 dollars) in 1972. The absolute size of marketing expenditures, as defined in this thesis, is much larger since in addition to expenditures on these three components of the marketing-mix, there are also expenditures on market research, salesmen, sales promotion and publicity.

Since expenditures on total marketing activities are unavailable, a more meaningful comparison of marketing with other components of aggregate demand can be obtained from table 1.2 by looking at the relative growth of the marketing sector as measured by these three components of the marketing-mix. In 1947, marketing expenditures accounted for 3.5 percent of gross national product, gross investment accounted for 16.6 percent, and government expenditures accounted for 12.9 percent. In 1972, marketing expenditures accounted for 5.9 percent of gross national product, gross investment accounted for 15.5 percent, and government expenditures accounted for 18.1 percent. Thus while the marketing and government sectors have increased relatively in the post-war period, the investment sector has declined somewhat.

Economists have so far paid scant attention to the contribution of marketing to aggregate demand. The primary reason

3. These three components of the marketing-mix are advertising, industrial research and development, and the estimated cost of consumer credit.
is historical. Marketing came of age in the affluent post-war society. It is truly a post-Keynesian phenomenon.

A marketing sector can be easily incorporated into the simple Keynesian model. Marketing activity like investment is associated with the business sector. Marketing activity is also similar to investment expenditures in that the level of marketing expenditures will be largely determined by the businessman's expectations about sales, profits and economic conditions in general. As a first approximation, marketing expenditures, like investment expenditures, can be treated as exogenous. Thus both marketing and investment represent injections into the circular flow of income. The income determination process cannot be properly understood without a separate treatment of both the marketing and the investment sectors.

The Marketing Sector.

The treatment of marketing as a separate component of aggregate demand implies that we are able to distinguish marketing goods from other kinds of goods. Traditionally economists have distinguished between three kinds of goods to correspond to the three sectors of a closed economy. These three categories of goods and services are consumption goods, investment goods, and public goods. The addition of a marketing sector implies that marketing goods should also be identified. This entails a reclassification of goods as defined in the present National Income Accounting system.

While it is not the purpose of this thesis to provide such
a reclassification, a number of goods and services which, under the present system, are treated as consumption goods, are clearly produced by the marketing sector. Examples of such marketing goods and services are advertising, credit service, market research, product research, and sales promotion. Under the present system of National Income Accounting the value added by the marketing sector is incorporated in the consumption goods sector. However, unless marketing expenditures are netted out of aggregate consumption expenditures, the impact of marketing on the income determination process cannot be analysed. 4

4. A number of problems can be envisaged in attempting a four-fold classification of the output of an economy rather than the traditional three-fold classification. However, most of these problems are conceptual rather than real, and appear only because economists have grown accustomed to thinking in terms of consumption, investment, and public goods. For example, consider the traditional distinction between consumption and investment goods. This distinction is easy to accept because of long usage. The only difference in the distinction between consumption and investment and between consumption and marketing is that investment goods increase the output of consumption goods while marketing goods increase the sale of consumption goods. In both cases the distinctions should be made if they are useful for the purpose of economic analysis.

Some real problems are likely to arise only in borderline cases. These problems already arise in the present three-fold classification. For example, an automobile which is used by a businessman for work and pleasure is partly a capital good and partly a consumption good. These complications will increase with a four-fold classification since the number of possibilities increase.

Another complication is that many goods which are now included in the capital budget of firms may have to be reclassified as marketing goods. For example, all expenditures on capital equipment which are intended to increase the output of marketing goods rather than consumption goods may have to be reclassified as marketing expenditures depending on the purpose of the analysis.
Marketing activity is used to promote the sale of both consumption and investment goods. Marketing expenditures which are intended to promote the sale of capital goods are included in the price of these goods. Therefore, total investment expenditures as defined in the National Income Accounts include the costs of marketing investment goods. As in the case of consumption expenditures, these marketing costs must be netted out of aggregate investment expenditures to understand the impact of marketing on the income determination process.

Let \( M \) denote the level of aggregate marketing expenditures. Let \( C_n \) denote aggregate consumption expenditures net of marketing costs. Let \( I_n \) denote aggregate investment expenditures net of marketing costs. The income identity defined in equation 6 above can be modified to take account of a separate marketing sector. Equation 6 becomes,

\[
6a. \quad Y = C_n + I_n + G + M.
\]

Marketing Activity and the Consumption Function.

To the extent that marketing expenditures are assumed to be autonomous, fluctuations in marketing expenditures have the same impact on the level of income and are subject to the same analysis as other components of autonomous expenditures, e.g., investment and government.\(^5\) However, in addition to this direct impact on

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5. Since marketing expenditures constitute a large percentage of total aggregate demand and are determined differently from \( C \), \( I \) and \( G \), it should be given the same amount of attention as the consumption, investment and government sectors in macro-economic analysis. To the extent that economists do not give it equal attention, our understanding of the income determination process is that less certain.
the circular flow of income, marketing expenditures have indirect effects on the level of aggregate demand via its effect on the levels of consumption, investment, and government. Expenditures by the government sector provide an economy with the necessary infrastructure, institutions and public goods it requires. Expenditures by the investment sector provide an economy with increased productive capacity. The output of the marketing sector, on the other hand, has no distinct physical form except to the extent that marketing expenditures create new products. The primary objective of marketing expenditures is the expansion of demand both at the micro and at the macro levels. Thus in addition to being an important component of aggregate demand, marketing activity has repercussions on the other demand sectors - consumption, investment, and government.

The effect of marketing activity on government demand is not investigated in this thesis. Therefore, throughout this thesis, total government expenditures are assumed to be autonomous. The relationship between marketing and aggregate investment is incorporated within the context of the simultaneous equation model developed later in this chapter and tested in chapter 4. However, there is no separate empirical investigation of the investment function in this thesis.

The relationship between marketing and aggregate consumption is one of the primary concerns of this thesis. The effect of marketing on the consumption function is investigated in chapter 4. The basic hypothesis which is incorporated in the static Keynesian model developed in the next section of this chapter, is that marketing expenditures increase the level of aggregate consumption
3.1.1. **THE PRODUCT MARKET WITH MARKETING TREATED AS A SEPARATE SECTOR - EXOGENOUS INVESTMENT AND MARKETING.**

When the marketing sector is identified as a separate sector in the economy, the product market of the static Keynesian model can be described by the following set of linear equations.

1a. \[ C_n = a_{on} + a_{1n}Y_d + a_2M = a_{on} + a_{1n}(Y - T - D) + a_2M \]

2a. \[ I_n = I_n^0 \]

3. \[ G = G^0 \]

4. \[ T = T^0 \]

5. \[ D = D^0 \]

6a. \[ Y = C_n + I_n + G + M \]

7. \[ M = M^0 \]

\[ 0 < a_{1n} < 1 ; a_2 > 0. \]

where \( M = (C - C_n) + (I - I_n) \)

and the other variables are as defined previously in this chapter.

The assumption that both \( I \) and \( M \) are autonomously determined is relaxed later in this chapter.

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6. The effect of marketing activity on the demand for individual products has been investigated extensively in the marketing discipline. The consensus is that marketing does increase the demand for a product (see earlier reference to the study by Palda on p.96, n.58 of this thesis). If consumers can be persuaded to switch their product allegiance by marketing activity it seems reasonable to assume that they can be persuaded to switch their allocation of income from savings to consumption and their allocation of time from the consumption of leisure to the consumption of goods. In any case, the hypothesis that marketing activity increases aggregate consumption is a testable hypothesis and therefore a proper field of econometric investigation.
Equilibrium Income and the Multiplier.

In the model without a separate marketing sector, equilibrium in the product market requires that total output is equal to the sum of consumption, investment, and government expenditures, \( Y = C + I + G \). Solving for the equilibrium level of income,

\[
Y = a_0 + a_1 Y - a_1 T - a_1 D + I + G
\]

6.1

\[
Y = \frac{a_0 - a_1 T - a_1 D + I + G}{1 - a_1}
\]

The investment multiplier, i.e., the multiplier associated with the change in income for a given change in investment, can be obtained by differentiating equation 6.1 with respect to \( I \) holding the other variables constant, \( dY/dI = 1/(1-a_1) \). Similarly the government multiplier, i.e., the multiplier associated with the change in income for a given change in government expenditure, can be obtained by differentiating with respect to \( G \), \( dY/dG = 1/(1-a_1) \).

When a marketing sector is included the equilibrium level of income becomes, \( Y = a_0n + a_1nY - a_1nT - a_1nD + a_2M + In + G + M \)

6a.1

\[
Y = \frac{a_0n - a_1nT - a_1nD + (1 + a_2) M + In + G}{1 - a_1n}
\]

The investment multiplier is now obtained by differentiating equation 6a.1 with respect to \( In \) holding the other variables constant, \( dY/dIn = 1/(1-a_1n) \). Similarly the government multiplier is now \( dY/dG = 1/(1-a_1n) \). The marketing multiplier, i.e., the multiplier associated with the change in income for a given change in marketing expenditure, can also be obtained by differentiating equation 6a.1 with respect to \( M \), \( dY/dM = (1+a_2)/(1-a_1n) \). Since \( a_2 \) is assumed to
be positive, and all the existing empirical evidence support this assumption, the marketing multiplier is more powerful than the investment and government multipliers. While this has not been pointed out before in the literature, it follows directly from the observation that marketing is a significant positive determinant of aggregate consumption. Thus the traditional multiplier effect is supplemented by the effect of $M$ on $C$, via $a_2$. The effect of marketing activity on income determination is illustrated in figure 3.1 below.

Income is measured on the horizontal axis and aggregate expenditures on the vertical axis. The curve labeled $I_n^0$ shows the level of exogenous investment. The curve labeled $I_n^0 + G^0$ shows the sum of exogenous investment and government expenditures. If there are no marketing expenditures in the economy so that consumption is a function only of disposable income, the curve labeled $C_n$ represents the aggregate level of consumption. The equilibrium level of income is $Y_n$. If the level of full employment output is $Y_f$ there is a deflationary gap of $Y_f - (C_n + I_n^0 + G^0)$. Exogenous marketing expenditure of a given amount $M = M^0$ shifts up the autonomous expenditures schedule to $I_n^0 + G^0 + M^0$. In addition it shifts up the consumption function to $C_n'$. Total aggregate expenditure increases to $C_n' + I_n^0 + G^0 + M^0$ thus reducing the deflationary gap to $Y_f - (C_n' + I_n^0 + G^0 + M^0)$.

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7. Estimates of the size of the marketing multiplier based on the coefficient estimates of chapter 4, are given in appendix A.
Figure 3.1
While a substantial part of investment expenditures cannot be explained by economic theory and must therefore be treated as autonomous, a large part of investment expenditures can be explained by economic variables. However, there are several theories of investment behaviour and each would lead to a different formulation of the investment equation. The investment equation specified in this thesis is similar to those used in existing econometric models. The theory underlying the functional form which was chosen can be described as a stock adjustment theory of investment. Besides being one of the most widely accepted theories of investment behaviour, the stock adjustment theory has the obvious advantage, from the point of view of this thesis, that investment behaviour can be analysed completely in the product market.\footnote{This is obviously not the case with the marginal efficiency of investment theory which relates investment to the rate of interest. The analysis of investment behaviour on the basis of the "MEI" theory would require incorporation of the money market into the model. As noted earlier in this chapter the money market was excluded from consideration in this thesis.}

The stock adjustment theory specifies a model of investment behaviour of the following form:
where \( I_t \) = gross investment in period \( t \)
\( K_t^* \) = desired capital stock in period \( t \)
\( K_{t-1} \) = actual capital stock in period \( t-1 \)
\( Y_{Et} \) = income which is expected in period \( t \) to prevail in period \( t+1 \)
\( D_t \) = depreciation in period \( t \).

This model suggests that net investment in period \( t \) is proportional to the discrepancy between the desired capital stock and last period's capital stock. Desired capital stock is proportional to expected income. Expected income is equal to current income plus some fraction of the change in income from period \( t-1 \) to period \( t \). Investment for capital consumption is proportional to last period's capital stock.

Combining the equations of the stock adjustment model yields the following function for gross investment

\[
I_t = \beta_1 Y_{Et} - \beta_2 K_{t-1} + \delta K_{t-1} \\
= \beta_1 Y_t - \delta \lambda Y_{t-1} + \beta_2 Y_{t-1} + (\delta - \beta) K_{t-1} \\
= (\beta_2 \lambda + \beta) Y_t - \beta_2 \lambda Y_{t-1} + (\delta - \beta) K_{t-1}
\]

Substituting for \( \lambda, \beta, \delta \) and \( \delta \), and adding a constant term gives the following investment function

\[
I_t = b_0 + b_1 Y_t + b_2 Y_{t-1} + b_3 K_{t-1}.
\]
Modifying the Stock Adjustment Model to take account of Marketing.

While it is not the purpose of this thesis to offer a new theory of investment behaviour, the investment equation specified above must be modified to be consistent with the basic hypotheses and theoretical developments of this thesis. The first modification follows from the separation of the marketing sector which requires that aggregate investment be measured net of marketing costs. The second modification follows from the hypothesized relationship between marketing activity and the level of investment. Investment goods, like consumption goods, require promotion. Just as new products need to be advertised and promoted, producers of capital goods embodying new technology must advertise and promote these goods. This suggests that marketing should be added as another independent variable in the investment equation. Since the introduction of new machinery takes time it is likely that there is some lag in the effect of marketing activity on investment demand. The marketing variable is therefore introduced with a one period lag.\(^9\) The final form of the investment equation is therefore \(I_{nt} = b_0 + b_1 n_{yt} + b_2 n_{yt-1} + b_3 n_{kt-1} + b_4 m_{t-1}\) where \(I_{nt}\) is gross investment net of marketing costs in the current period.

\(^9\) The inclusion of marketing lagged one period as an independent variable in the investment function is consistent with another hypothesis of this thesis. This hypothesis, which is supported by the empirical results in chapter 6, is that marketing induces workers to force up money wage rates. This induced change in relative factor prices should encourage the substitution of capital for labour thereby increasing the level of investment. In this way marketing has a lagged effect on the level of investment.
The Marketing Equation.

Unlike investment behaviour where the problem is that of choosing an appropriate investment function out of several which have been suggested by existing economic theory, the problem with marketing behaviour is that existing economic theory has very little to say. However, there are several compelling reasons why a model of income determination which treats total marketing expenditures as autonomous must be regarded as incomplete.

One reason for specifying a marketing function which has been given some attention in the existing literature, is to take care of possible simultaneity bias in the coefficient for marketing in the consumption function,\(^\text{10}\) arising out of possible dual causality between marketing and sales.\(^\text{11}\) While the objective of a firm's marketing expenditures is to increase its sales, the hypothesis that marketing is a function of sales is suggested by the way in which some firms determine their marketing budget. Many studies\(^\text{12}\) have found that a common method used by firms to determine their marketing appropriation is the "percentage of

\(^{10}\) And in the investment function if this were estimated.

\(^{11}\) One author who is especially strong on the idea that marketing should be treated as an endogenous variable is Richard Schmalensee. In his preface to The Economics of Advertising (North-Holland, 1972), he says that, "This study is concerned with the impact of advertising on consumer behaviour and market performance. Its unifying theme is that advertising expenditure must be treated as an endogenous variable in any investigation of its effects, and thus its determinants must be explicitly considered."

\(^{12}\) For a review of the findings of these studies see Schmalensee, *op.cit.*, pp.17-18.
sales" method.\textsuperscript{13} This observation has led economists to acknowledge the possibility of dual causality between marketing and sales.

In previous empirical studies where an aggregate advertising function was specified, the rationalization for this function followed from the observation that some firms used the percentage of sales method to determine their advertising budget.\textsuperscript{14} While this is a reasonable justification, it would seem that the matter warrants some further consideration than was given it by the previous authors, in view of the existing controversy among economists as to the direction of causation between marketing and sales.

In reviewing the literature in chapter 2 of this thesis many authorities in the economics, socio-economics, and marketing literatures were quoted to support one of the basic hypotheses of this thesis: marketing activity leads to an increase in the level of aggregate demand via its effect on aggregate consumption. Two previous empirical tests (Yancey, \textit{op.cit.} and Taylor and Weiserbs, \textit{op.cit.}) also support this hypothesis. However, a number of economists still hold the view that at least at the macro level, the direction of causation is from aggregate demand to

\textsuperscript{13} Note that most of these studies relate only to the advertising budget. However, as Stanton, \textit{op.cit.}, p.510, has correctly observed, "There are four basic methods of determining the budget allocation for promotion. They are frequently discussed in connection with advertising appropriation alone, but they may also be applied to the total promotional appropriation."

\textsuperscript{14} This is true of the studies by Yancey, \textit{op.cit.}, and Schmalensee, \textit{op.cit.}
marketing rather than the other way round. This alternative hypothesis demands some critical evaluation before proceeding. It was noted earlier that the a priori reasoning for the hypothesis that marketing is a function of aggregate demand or aggregate sales, is the observation that some firms use the percentage of sales method in determining their marketing budget. Several criticisms can be levied against this a priori reasoning.

The first criticism is that the "percentage" varies between firms and that this percentage can, and does change over time.

The second criticism is that the "percentage" can be based on past sales, current sales, future or expected sales, or some combination of all three.

The third criticism is that the percentage of sales method is only one of several methods used by firms to determine their marketing budget and that fewer firms are using this method in the post-World War II period. Empirical studies have shown that the larger and more progressive firms are switching over to the use of the "task" method in determining their marketing budgets. This method determines the marketing budget on the basis of the sales objective of the firm. The task method is increasingly used by firms as techniques are developed to assess the effectiveness of marketing.

15. Richard Schmalensee whose ideas in The Economics of Advertising, op.cit., were first developed for his doctoral dissertation in the Department of Economics, Massachusetts Institute of Technology, under the supervision of Franklin M. Fisher, A. Adelman and Evsey D. Domar, is a typical example of economists holding this view. It is suggested later in this chapter that Schmalensee's a priori reasoning and empirical support for this hypothesis is extremely weak.
The approach described by Mortimer is the task method. It became recognized as the best approach to the development of advertising appropriations after World War II, and is being adopted by the most progressive marketers. It is a process of devising an advertising appropriation by building to the result, brick by brick, rather than by using some rule of thumb.16

The fourth criticism is that both economists and authorities in the marketing literature have long recognized that it is illogical to treat marketing expenditures as an effect of sales rather than as a potential cause. For example, in the oft-cited study of how firms determine their advertising appropriation, Taplin observed that:

The practice of having conventional percentage of sales which are regarded as proper indicators of future advertising expenditures appears prima facie to be an illogical practice, in effect treating advertising expenditure as an effect of sales whereas common sense suggests that it should be regarded as a potential cause.

16. Roger Barton, Media in Advertising (Mc Graw-Hill, 1964), p.12. In the footnote to this statement, Barton continues: "The Gallagher Report, Vol 11, no. 1, Jan. 7, 1963, p.6, asked companies how they arrived at the precise amount they set aside for their industrial advertising budgets, and reported these answers: task method, 39 per cent; percentage of previous year's sales, 16.9 per cent; percentage of anticipated sales, 12.8 per cent; arbitrarily set by management, 7.6 per cent; task method plus percentage of previous year's sales, 6.9 per cent; and task method plus percentage of anticipated sales, 12.7 per cent. Thus exactly half of the companies used the task method alone or in combination with other methods. Industrial Marketing (vol. 48, no. 1, January, 1963, p.72) surveyed 304 industrial companies in 1962 and found that 28.9 per cent were using the task to be accomplished as the basis for their appropriation. Per cent of sales, for the most part next year's anticipated sales, was used as the basis by 25 per cent, and per cent of profits by 2 per cent. There were 35.9 per cent of the companies using a combination of task method and per cent of sales as the basis."
of sales.\textsuperscript{17}

The view expressed by Taplin has found its way into most basic texts on marketing. The following quote from Stanton, \textit{op.cit.}, pp.510-511, is typical.

Actually the method [percentage-of-sales] is unsound and logically inconsistent. By setting promotional expenditures for one year on the basis of sales in the preceding year, management is saying that promotion is a result of sales, when, in fact, it is a cause of sales. Even when promotion is set as a percentage of future sales, this method is logically indefensible. By forecasting future sales and then setting the promotional appropriation, management is still considering advertising and personal selling to be a result of sales. If sales depend upon promotion, as is truly the case, then they cannot be forecast until the promotional appropriation is determined. Another undesirable result of this method is that promotional expenditures will be reduced just when sales are declining. If the reasons for a sales decline are not clear, management can compound its difficulties by withdrawing promotional support at that time.

If it is illogical to treat marketing expenditures as an effect of sales rather than as a potential cause, the role of economic theory should be to attempt to provide some logical explanation of why firms use the percentage of sales method rather than to deduce from such observed behaviour the illogical hypothesis that marketing is a function of sales and to attempt to use regression and correlation analysis to support such a causal

relationship.¹⁸ Let us examine the work of Schmalensee as typical of those economists who tend to emphasize causality from sales to marketing rather than the other way round.

In chapter 3 of his *Economics of Advertising* Schmalensee attempts to formulate an aggregate advertising function for the United States. In doing so he relates aggregate advertising expenditures to various components of gross national product. He rationalizes this relationship on the "widespread use of 'percentage of sales' decision rules" (p.48). However, Schmalensee is also concerned as to whether his aggregate advertising function can be estimated by ordinary least squares or whether there will be simultaneous equation bias because "one or more of the GNP components are influenced by advertising" (pp.48-49). He notes that, "A number of authors, beginning with Borden (1942), have argued that advertising affects the level of aggregate demand" (p.49). But for Schmalensee, ordinary least squares can be used since, "Luckily, we are able to show in section 3.2, below, that no GNP components are significantly affected by aggregate advertising" (p.49).

¹⁸ An elementary course in correlation analysis warns us that correlation analysis cannot be used to determine causality. Causality must be based on some reasonable *a priori* hypothesis and correlation or regression analysis can be used to support or reject this hypothesis.
It is imperative that we examine both the theory and empirical tests which led Schmalensee to reach this conclusion.

It seems clear that government purchases of goods and services do not vary in any important way with national advertising; the budget determination process is subject to many forces stronger than the public relations ads of aerospace firms.

Total private business spending on plant and equipment makes sense only as a derived demand. The distribution of sales among producers of these goods may well be influenced by advertising, as these firms do compete for market shares. But the theory of the firm effectively rules out any influence of aggregate advertising of plant and equipment on total economy-wide purchases of these products. To the extent that the decisions to advertise and to invest in plant and equipment are based on the same sales expectations, there may well be a correlation between investment and advertising, with both being high when expected sales of final goods are high. But no direct causal relation is thereby implied.

No theory permits us to rule out an impact of advertising on investment in housing, another GNP component. But most advertising of housing is local and does not show up in the national figures. There are no quarterly figures available for local advertising spending, let alone for local advertising of new housing, and we have no way of knowing whether local and national advertising are highly correlated, so we must drop investment in housing from further consideration.

This leaves consumption and net exports as the components of GNP that could possibly be directly influenced by national advertising. Total exports certainly are not affected by a change in domestic advertising. From the arguments above, it is unlikely that imports of raw materials, intermediate goods, or producer's durable equipment are directly influenced by advertising, as all represent derived demands. Since it is hard to compute exactly what fraction of total imports represents consumption goods, and since total consumption is much larger than any reasonable estimate of this quantity, it seems clear that our focus must be on consumption expenditures.

As appendix B makes clear, we have reliable quarterly data for national advertising spending in all major media from 1956 through 1967, with good figures for some media for earlier years. We thus consider only the period 1956-1967 in our analysis of advertising and consumption. In fact, we employ only the period from 1956 II through 1967 III in order to experiment with leads and lags in
the advertising series.

Let us first examine the evidence on the hypothesis under study that is provided by simple correlations. Let C be per capita consumption spending in 1958 dollars, and let A be real advertising messages per capita, where each message is valued at its price in 1960. Over the period 1956 II-1967 III, we observe the following correlations:

\[ \rho(C, A(-1)) = .969 \]
\[ \rho(C, A) = .978 \]
\[ \rho(C, A(+1)) = .980 \]

In the next section, we argue that consumption of services is not associated with much national advertising. Most services are either advertised very little or are produced and sold by local advertisers. Quarterly series are not available for those components of services consumption, such as purchased intercity transportation, that are advertised nationally. It seems appropriate, then, to analyse the relation between advertising and consumer spending on goods only, as well as the relation between advertising and total consumption spending. Let \( C' \) be consumption spending on durable and non-durable goods in 1958 dollars per capita. For the same period as above, we find the following:

\[ \rho(C', A(-1)) = .972 \]
\[ \rho(C', A) = .985 \]
\[ \rho(C', A(+1)) = .986 \]

The second set of correlations are all higher than the first set, but the pattern is the same in both. Real advertising in the next quarter is more closely correlated with consumption in the current quarter than is advertising last quarter. This suggests that causation runs from consumption to advertising (pp.50-51).

To support his conclusion Schmalensee backs up his simple correlation results with regression results. He says, "If aggregate advertising influenced aggregate consumption spending, we would expect both the coefficient of advertising and its associated t-statistic to be largest with A, next largest with A(-1), and quite small when A(+1) is introduced into the equation. Nowhere do we observe this" (p.54).

**Marketing Equation Based on Uncertainty.**

The type of economic rationalizations and statistical tests used by economists such as Schmalensee to justify one way causality
from sales to marketing or at least to emphasize this direction of
causation, are, at best, highly questionable.\textsuperscript{19} Rather than
attempting to find theoretical justification and empirical support
for what is inherently an illogical hypothesis, it seems that
more meaningful insights into the nature of the marketing func-
tion can be obtained by trying to explain why firms use the per-
centage of sales method.

The most reasonable \textit{a priori} explanation for the use of the
percentage of sales method by firms in determining their marketing
budget is uncertainty. Most firms are unable to estimate accurately
the extent to which marketing will increase profitable sales.\textsuperscript{20}
As a result firms react in a way which seems irrational. Consider
for example, the oft-cited observation that when sales fall firms

\textsuperscript{19} Note for example the small differences in the size of the
simple correlation coefficients, the generally simplistic
method of attempting to show one-way causality and the ar-
bitrary exclusion of several components of aggregate demand
from consideration.

\textsuperscript{20} "Given that advertising is known, in broad terms, to have
some effect in increasing the sales of a product, there is
clearly a case from the firm's point of view for consi-
dering its adoption. But to the extent that a firm is
ignorant of precisely what effect advertising of a given
type, on a given scale, will have on a given market, to
that extent the status of advertising as a rational business
activity is impaired, and intuition, guess-work, and rules
of thumb must take over.

The significance of such ignorance should not be ex-
aggerated. Many business decisions are made without much
real evidence as to outcome; the taking of risks is inevi-
reduce their marketing expenditures. This reaction may not be as irrational as it seems. Firms have to determine their marketing budget on the basis of how much such marketing expenditures is expected to increase sales. If sales fall, or do not increase as much as predicted, this is an indication that marketing is not as effective as estimated i.e., it is no longer profitable to maintain the same level of marketing expenditures. Similarly an increase in sales greater than expected can be interpreted as an underestimate of the effectiveness of the marketing program and would suggest an increase in marketing expenditures. It is clear that the greater the uncertainty in estimating the effectiveness of the marketing program, the more reasonable it seems that firms should rely on changes in sales as an index of the effectiveness of marketing. This rationalization also explains the relative decline of the use of the percentage of sales method in the post-World War II period and the greater use of the task method by the larger and more progressive firms. The larger firms can afford to estimate more accurately their sales function relating sales to marketing and better techniques are available for such
estimation in the post-World War II period.\textsuperscript{21}

If sales is used as a proxy for the effectiveness of marketing by the individual firm, this suggests a marketing function relating marketing expenditures to the level of sales and to changes in sales. This means that at the macro level, aggregate marketing expenditures can be related to the level of aggregate demand and to changes in aggregate demand, \( M_t = \alpha Y_t + \beta (Y_t - Y_{t-1}) \).

\textsuperscript{21} The Labour Party's Commission of Enquiry into Advertising suggests that the larger firms were offended if it was implied that they used the percentage of sales method. Commenting on the earlier finding by Taplin, \textit{op.cit.}, that many firms used the percentage of sales method, the Commission reported: "Although the use of these methods was acknowledged by some of the firms which gave evidence, a number of respondents claimed, explicitly or implicitly, that they followed the procedure of deciding on the specific job to be done and of budgeting for advertising with reference to that end - which would seem to be the commonsense method, provided the firm has some idea of the means which will produce the desired results. Thus Unilever listed as factors receiving 'long and detailed study' before advertising expenditure was fixed: (a) size of market, (b) existing breakdown of market by brands, (c) characteristics of existing and desired consumers, (d) frequency of purchase, (e) purposes for which products is used, (f) available media, (g) varying strength of individual brands in different areas, (h) state of development of brand (many new brands show a loss in their early years until an economic level of sales has been reached), and (i) competitive activity. The final budget is a 'nice balance' between all these factors. A representative of Procter & Gamble denied that his firm fixed advertising at a certain percentage of sales, and said that it prided itself on making a more thorough study than most other marketing organizations of the optimum level of spending in relation to the potential of a brand," \textit{op.cit.}, pp.13-14.
Another explanation for the use of the percentage of sales method by firms in determining their marketing budget is financial considerations. While the underlying structural relationship is $S = f(M)$, where $S$ is the level of sales, this may be subject to a financial constraint. This means that firms may only be able to satisfy their optimum marketing budget determined by the structural relationship, when sales are sufficiently high or increasing to provide the necessary funds. This explanation also suggests an observable relationship of the form

$$M_t = \alpha Y_t + \beta (Y_t - Y_{t-1})$$

at the macro level.

A final explanation for the use of the percentage of sales method by firms in determining their advertising budget is that this method makes advertising costs a variable cost rather than a fixed cost. This explanation is common among marketing theorists. However, the explanation given by the typical marketing theorist seems to follow from the practice of discussing the marketing budget in terms of the advertising budget. Thus it

22. Compare this hypothesis with the theory that Investment is a function of profits.

23. Two comments on this hypothesis are relevant. The first is that it is interrelated with the uncertainty hypothesis to the extent that firms are less willing to undertake "risky" expenditures with borrowed funds than with internal funds. The second comment is that imperfect capital markets add to the cost of borrowed funds relative to the opportunity cost of using internal funds.

24. See for example, Stanton, op.cit., p.510.

25. See previous footnote on p.139 of this thesis.
is often pointed out that when sales fall a firm will cut back on advertising and rely more on its sales staff to promote its products directly. What this explanation indicates is that when firms are faced with a decline in profits they attempt to reduce costs by operating more efficiently. In the particular case being considered the implicit assumption is that prior to the decline in sales the firm was not utilizing the full potential of its sales staff. Faced with a decline in sales the firm cuts its advertising expenditure, which on the face of it looks like a reduction in marketing effort and therefore suggests that marketing is a function of sales rather than the other way round. However, this is not the case. The firm reduces its advertising expenditure only because when faced with a declining sales situation it can get more productivity out of its sales staff. The decline in sales and the threat of possible lay off act as incentives to the sales staff to increase its efforts. Total marketing expenditure has been reduced but marketing effort has not fallen. The firm is able to get the same marketing effort at a lower cost.26

An Alternative Derivation of the Marketing Equation.

An alternative way of deriving the marketing equation would be to consider the underlying rationale of the stock adjustment

26. This suggests that marketing expenditures is not the "ideal" index of marketing effort, a problem which is recognized in both the marketing and economics literature.
model as applied to investment and see whether it provides any insights into the determination of a marketing equation. To do so we need to consider the similarities between investment and marketing expenditures.

The primary function of investment is to provide increased output capacity for the firm and for the economy as a whole, i.e., \( \Delta Y_K = f(I^*) \) where \( \Delta Y_K \) is the change in the capacity output of the economy, and \( I^* \) is the level of net investment. This functional formulation suggests that \( I^* \) is the independent or exogenous variable. Prior to Keynes, the level of investment was thought to be determined purely by cost considerations, i.e., the rate of interest. Keynes pointed out that since the marginal efficiency of investment could not be estimated with any degree of accuracy, the level of investment expenditures is largely dependent on businessmen's expectations and must be treated as autonomous. Keynes' main thesis was that changes in investment, which are autonomous, will cause changes in income and employment. The direction of causation seemed clear, the level of income is a function of the level of investment and changes in the level of income will be caused by autonomous changes in the level of investment. Yet it was not long before economists rationalized causality in the opposite direction in the form of the stock adjustment model. To do this economists looked at the purpose of investment, i.e., the creation of additional output capacity. If this is the primary function of investment it seems reasonable to suppose that businessmen will plan their investment expenditure on the basis of their forecast of how much new capacity will
be required, i.e., on the expected change in demand for the output of their firm. 27 Therefore, it was hypothesized that in the aggregate, net investment expenditure would be determined by the discrepancy between desired output capacity and actual output capacity.

The primary function of current marketing expenditure is to increase the sales of the firm and of the economy as a whole, i.e., \( \Delta Y = f (M^*) \) where \( \Delta Y \) is the change in the level of aggregate demand and \( M^* \) is the level of net marketing expenditure. 28 This functional formulation suggests that \( M^* \) is the independent or exogenous variable. Marketing expenditure, like investment, cannot be determined purely by cost considerations. Since the effectiveness of the marketing program - marginal efficiency of marketing - cannot be determined with any degree of accuracy, the level of marketing expenditure is largely dependent on businessmen's expectations and should be treated as autonomous.

27. See formulation of investment function on p.136 above.

28. At any point in time there is a "stock" of marketing available to a given society analogous to its capital stock. This stock can be thought of as being built up by annual additions of net marketing expenditure, i.e., it is the integral of past additions to the marketing stock, where additions to the marketing stock is defined as current marketing expenditure less depreciation on the existing marketing stock.
This thesis suggests that changes in marketing, which are autonomous, will cause changes in income and employment. The direction of causation seems clear, the level of income is a function of the level of marketing and changes in the level of income will be caused by autonomous changes in the level of marketing. Yet causality in the opposite direction can be rationalized by looking at the purpose of marketing, i.e., the creation of additional demand. If this is the primary function of marketing it seems reasonable to suppose that businessmen will plan their marketing expenditure on the basis of their forecast of how much additional output must be disposed of, i.e., on the expected change in the output of the firm. Therefore, it is hypothesized that in the aggregate, net marketing expenditure is determined by expected changes in the level of output, i.e., on the discrepancy between the desired marketing stock and the actual marketing stock.

A stock adjustment theory of marketing behaviour would be of the following form:

\[
\begin{align*}
M_t &= \alpha (M^*_t - M_{st-1}) + D_{Mt} \\
M^*_t &= \gamma Y_{Et} \\
Y_{Et} &= \beta (Y_t - Y_{t-1}) + Y_t \\
D_{Mt} &= \delta M_{st-1} + \chi, \beta, \gamma, \delta > 0.
\end{align*}
\]

where
\[
\begin{align*}
M_t &= \text{total marketing expenditure in period } t \\
M^*_t &= \text{desired marketing stock in period } t \\
M_{st-1} &= \text{actual marketing stock in period } t-1 \\
Y_{Et} &= \text{income which is expected in period } t \text{ to prevail in period } t+1.
\end{align*}
\]
\( D_{Mt} \) = depreciation of the marketing stock in period \( t \).

This model suggests that the net flow of marketing expenditure in period \( t \) is proportional to the discrepancy between the desired marketing stock and last period's marketing stock. Desired marketing stock is proportional to expected output. Expected output is equal to current output plus some fraction of the change in output from period \( t-1 \) to period \( t \). Expenditure to replace depreciation on the marketing stock is proportional to last period's marketing stock.

Combining the equations of the stock adjustment model yields the following equation for gross marketing expenditure

\[
M_t = \alpha Y_t + \beta M_{st-1} + \delta M_{st-1} \\
= \alpha Y_t + \beta Y_{t-1} + \alpha Y_{t-1} + \delta M_{st-1} \\
= (\alpha Y + \beta Y_{t-1}) Y_t - \alpha Y_{t-1} + \delta M_{st-1}
\]

Substituting for \( \alpha, \beta, \gamma \) and \( \delta \), and adding a constant term gives the following marketing function

\[
M_t = d_0 + d_1 Y_t + d_2 Y_{t-1} + d_3 M_{st-1}
\]

---

29. This equation is somewhat similar to that used by Taylor and Weiserbs, op. cit., p.652, for their advertising function, although no justification was given by Taylor and Weiserbs for their specification of the advertising function. Following Taylor and Weiserbs, \( M_{t-1} \) is substituted for \( M_{st-1} \) in the empirical tests.
With investment and marketing endogenous, the product market of the modified Keynesian model can be represented by the following set of linear equations.\(^{30}\)

1a. \( C\text{\textsubscript{d}} = \alpha_0 + \alpha_1 Y + \alpha_2 M \)

2a. \( I\text{\textsubscript{d}} = \beta_0 + \beta_1 Y + \beta_2 Y - 1 + \beta_3 Y - 2 + \ldots + \beta_4 M - 1 \)

3. \( G = G^0 \)

4. \( T = T^0 \)

5. \( D = D^0 \)

6a. \( Y = C\text{\textsubscript{d}} + I\text{\textsubscript{d}} + G + M \)

7a. \( M = \delta_0 + \delta_1 Y + \delta_2 Y - 1 + \delta_3 Y - 2 + \ldots + \delta_4 M - 1 \)

\( 0 < \delta_1 \leq 1, \delta_2 > 0, \delta_4 > 0 \).

3.1.3 EXTENSION OF THE BASIC MODEL - LAGS IN CONSUMER BEHAVIOUR AND MARKETING ACTIVITY.

In any analysis of the consumption function it is now common to distinguish between the short-run mpc and the long-run mpc. A lagged consumption term is the most common variable used to capture the influence of the past on current consumer behaviour. A lagged consumption term can be justified on several grounds.\(^{31}\)

\(^{30}\) This change in the specification of the model means that the coefficient estimates for the consumption function are likely to change. Estimates of the size of the multiplier for the autonomous component of marketing based on these new coefficient estimates obtained in chapter 4, are given in appendix A.

\(^{31}\) See Suits, op.cit. Some of the factors mentioned by Suits for which lagged consumption can be used as a proxy are previous maximum income, lagged income, change in income, reversal of the habituation process, shifts caused by unknown factors, and stock adjustment.
Consider for example, Friedman's permanent income hypothesis, 
\[ C_t = kY_t, \] 
where \( Y_p = Y_t + bY_{t-1} + b^2Y_{t-2} + \ldots \), \( 0 \leq b \leq 1 \). Using the Kayck transformation, the observable explanatory variables for the consumption function are current income and lagged consumption.\(^{32}\)

Adding a constant term and using disposable income gives a consumption function of the form \( C_t = a_0 + a_1Y_{dt} + a_2C_{t-1} \) suggesting that lagged consumption should be added to the consumption function.

In analysing the effect of marketing on the consumption function the introduction of lagged marketing as another independent variable can also be justified. Yancey, \textit{op.cit.}, for example, justified the inclusion of lagged advertising in some of his models on the grounds that some marketing studies found a lag in the effect of advertising on sales (p.74).\(^{33}\) This justification suggests that the sign of the coefficient for lagged marketing should be positive. However, there is an alternative justification for including lagged marketing as a variable in the consumption function. Excessive marketing in period \( t-1 \) might

\[^{32}\] Tagging \( Y_p \) one period and multiplying by \( b \),

\[
bY_{p-1} = bY_{t-1} + b^2Y_{t-2} + b^3Y_{t-3} + \ldots 
\]

Therefore, \( Y_p = bY_{p-1} = Y_t \).

\[
bC_{t-1} = bkY_{p-1} 
\]

Therefore, \( C_t = bC_{t-1} = k(Y_p - bY_{p-1}) \).

And \( C_t = kY_t + bC_{t-1} \).

\[^{33}\] Many basic texts on marketing argue that advertising has a cumulative effect on sales. See for example Mandell, \textit{op.cit.}, p.50.
shift purchases from period \( t \) to period \( t-1 \). This would be reflected by a negative coefficient for lagged marketing.\(^{34} \) Therefore no \textit{a priori} restriction can be placed on the sign of the coefficient for lagged marketing.

The consumption function can be re-specified to take account of these lagged effects. The product market is now represented by the following set of linear equations.\(^{35} \)

\begin{align*}
1b. \quad C_n &= a_0 + a_1 Y_d + a_2 M + a_3 C_{-1} + a_4 M_{-1} \\
2a. \quad I_n &= b_0 + b_1 Y + b_2 M_{-1} + b_3 K_{-1} + b_4 M_{-1} \\
3. \quad G &= G^0 \\
4. \quad T &= T^0 \\
5. \quad D &= D^0 \\
6a. \quad Y &= C_n + I_n + G + M \\
7a. \quad M &= d_0 + d_1 Y + d_2 Y_{-1} + d_3 M_{-1} \\
\text{0} &< a_1 n < 1, \quad a_2 > 0, \quad b_4 > 0.
\end{align*}

\(^{34} \) See Yancey, \textit{op.cit.} p.70.

\(^{35} \) With the inclusion of those lagged terms a distinction can be made between impact and long-run multipliers. Again it follows logically from the \textit{a priori} hypothesis \( a_2 > 0 \), that the impact multiplier for autonomous changes in marketing expenditures will be greater than the impact multiplier for autonomous changes in investment expenditures or government expenditures. Estimates of the size of the impact multipliers are given in appendix A. The long-run multiplier for autonomous changes in marketing will also be greater than the long-run multiplier for autonomous changes in investment or government. Estimates of these are also provided in appendix A.
PART II
MARKETING ACTIVITY IN A DYNAMIC HARROD-DOMAR MODEL.

Introduction and Review.

In his essay on dynamic theory, Harrod suggested that to develop a dynamic theory it is necessary to have a mental revolution so that economists can "think dynamically." To fully appreciate the contribution of this section of the thesis it is essential to think in terms of a dynamic real world economy such as the post-war United States in which the capacity of the economy is increasing through time. The factors which contribute to this expansion in capacity are not only net investment and population increase, but increased hours of work, increased labour participation, a continuous striving by labour to increase its productivity by increased training and education, and by moving up to higher and more productive occupations. A trend increase in capacity implies that unlike the Keynesian system, aggregate demand must also increase at a trend rate to maintain full employment. The static model of income determination discussed in part 1 of this chapter therefore has to be modified to take account of a growing economy.

The first post-Keynesian models of economic growth were de-


37. For extensive documentation on these observations see chapter 1 of this thesis.
veloped by Harrod and Domar. Harrod observed that Keynes' General Theory is essentially static. However, he noted that, "Positive saving, which plays a great role in the General Theory, is essentially a dynamic concept." (op. cit., 1940, p.11). Domar also recognized capital accumulation as the dynamic element of the economic system. But unlike Harrod, Domar emphasized the effect of capital accumulation on the expansion of capacity and therefore the resulting problem of maintaining full employment, rather than the demand creating aspects of capital accumulation. According to Domar the relation between capital accumulation and employment was considered by both the Classical and Neoclassical economists, but most notably by Karl Marx. However, all these previous contributions had tackled the problem from the labour supply side. In both "the magnificent dynamics" of the Classical theory and in Marxian economics, the labour supply is endogenous. The capacity of the economy increases if the labour supply increases. Capital accumulation plays a relatively passive role in that it provides the wages fund or periodically shifts up the production function. In the latter case increased capacity is measured via the increase in labour productivity. Both Harrod and Domar rejected the Classical/Marxian dynamic analysis. Harrod,

because he was more concerned with the relationship between the
growth in income and capital accumulation - the acceleration
principle - and Domar, because the previous approach had failed
to come up with a formula which would specify the rate of growth
of income necessary to maintain full employment in a growing
economy. According to Domar, the Classical/ Marxian/Neoclassical
theories had failed specifically because they concentrated on
labour rather than capital. Capital accumulation has a dual
character which increases in the labour force does not. Net in-
vestment generates income and employment. Increases in the labour
force or labour productivity increase capacity without directly
generating income and employment.39 It was this dual character
of new investment which led Domar to formulate his model of
economic growth around investment. Since marketing expenditure
has this same dual character, as will be shown shortly, the Domar
model is particularly suitable to analysing its implications for
growth and full employment.

3.2.1. AUTONOMOUS MARKETING AS A SOURCE OF AGGREGATE DEMAND.

Since Keynes' *General Theory* economists have concentrated
their attention on the role of investment in the economy. With-
in the context of the static Keynesian model investment is viewed
as the vehicle for maintaining a high level of aggregate demand

39. Unless the increase in labour productivity is directly
attributable to educational expenditures.
and employment. Within the context of Harrod's model and the acceleration principle, investment plays the crucial role of maintaining a growing level of aggregate demand. In Domar's model investment plays the crucial role of expanding the productive capacity of the economy. In all these models consumption plays a rather passive role. It is true that the higher the level of income the higher the level of consumption, but the growth in consumption demand is induced within the system. Exogenous trend increases in consumption demand are implicitly assumed away.

An important and growing source of aggregate demand in the post-war period which has been neglected by economists, is marketing expenditure. Some marketing expenditures such as those on market research and product development are similar to investment expenditures. Yet economists have made no attempt to formulate theories to explain these expenditures. Other marketing expenditures such as those on advertising, credit service, and other forms of sales promotion, are different from

[40] There is no single estimate of the size of marketing expenditure available. This is due partly to problems of definition as to which expenditures should be included. In the marketing literature marketing costs include both distribution costs and promotional costs. In this thesis only expenditures on promotion are included in marketing expenditures. However, even a conservative estimate of marketing expenditure would show that such expenditure is almost as great as expenditure on gross investment in the post-war period. For example, if we use Kjaer-Hansen's estimate that aggregate advertising is 17 percent of aggregate promotional costs (Kjaer-Hansen, op.cit., p.41) total marketing expenditure in 1972 would be 92.8 billion dollars measured in 1958 prices compared with gross investment of 122.9 billion dollars (See Table 1.2, p.39 above).
both investment expenditures and consumption expenditures. The theory of marketing behaviour in economic analysis is currently at the same stage of development as the theory of investment behaviour was at the time of Keynes' *General Theory*. Prior to Keynes a theory of investment behaviour was derived from the theory of the firm. The level of investment was determined by the rate of interest. Similarly, today whatever theory of marketing behaviour is available in economics derives from the theory of the firm. In the *General Theory* Keynes emphasized the role of uncertainty and expectations in explaining investment behaviour. Until the latter factors were investigated and theories of investment behaviour developed and tested, investment was treated as exogenous in macroeconomic analysis. The situation with regards to marketing behaviour is identical at the current time. Expectations and uncertainty play an important role in determining the level of marketing. And until theories are formulated and tested, marketing expenditures have to be treated as largely autonomous.

Autonomous expenditures on marketing like other forms of autonomous expenditures add to aggregate demand and create income and employment. More importantly, marketing expenditure, like net investment, increases continuously through time and is there-

41. This theory tend to suggest that the level of marketing is determined by the level of sales. For criticisms of this theory see part 1 of this chapter.

42. However, see part 1 of this chapter for an attempt to formulate a marketing function.
fore subject to dynamic analysis.\textsuperscript{43}

In addition to providing an increasing direct source of aggregate demand, marketing also increases aggregate demand by increasing consumption demand.\textsuperscript{44} This means that in a growing economy increases in consumption demand are induced not only by increases in income but by increases in marketing. In this respect a given rate of growth of marketing will add more to aggregate demand than an equal rate of growth of investment.\textsuperscript{45}

\textsuperscript{43} Harrod, \textit{op.cit.}, 1948 uses the term dynamics in two ways. In identifying savings as the dynamic element in Keynesian economics he suggests that dynamic analysis is concerned with variables which add to a stock thereby necessitating changes in other economic variables in order to maintain equilibrium, p.11. It will be seen below that marketing does have this dynamic feature. However, Harrod also used the term dynamic to apply to situations of continuous change as opposed to once for all changes, pp.3-9. It is in the latter sense that marketing is regarded as dynamic in the present context.

\textsuperscript{44} This is an empirically testable hypothesis which is receiving increasing attention in the economic literature. Both existing empirical tests and the empirical tests carried out in chapter 4 support this hypothesis.

\textsuperscript{45} See part 1 of this chapter for an explanation of why the marketing multiplier is larger than the investment multiplier.
3.2.2 MARKETING AS A SOURCE OF INCREASING CAPACITY.

Marketing expenditure like investment generates income. Investment also adds directly to the physical capital stock thus increasing the capacity of the economy. Marketing also adds to the stock of factor inputs available to the economy. But it does so in a more indirect and complicated way. The basic hypothesis is that marketing increases the supply of labour both in terms of total man-hours and in terms of efficiency units.\footnote{Marketing might also increase investment demand thereby increasing capacity via increases in the capital stock.}

There are two ways in which marketing increases the supply of labour. Marketing increases the supply of labour measured in man-hours by shifting out the aggregate labour supply curve over time.\footnote{See figure 3.2, below.} For the individual household marketing changes its leisure-goods trade off in favour of increased goods.\footnote{The theoretical basis for this hypothesis is explored fully in chapter 5 of this thesis. Chapter 5 combines both a theoretical development and an empirical test of this hypothesis. Although many economists and marketing theorists have recognized the possibility of this causal relationship (see references in chapters 1, 2 and 5 of this thesis) there has been no previous empirical test of this hypothesis. The empirical results obtained in chapter 5 do support the hypothesis.} To be able to appreciate the significance of the effect of marketing
on the supply of labour it is necessary to stop thinking in terms of the Keynesian consumption function where income is the independent variable and consumption the dependent variable. As Suits (op.cit., p.21) noted, this might be a reasonable hypothesis in a depressed economy with limited employment opportunities.

But in a relatively full employment society consumers are likely to determine their income and consumption/saving levels simultaneously.\textsuperscript{49} If income is a function of consumption, via consumption standards, and marketing influences consumption standards, then income is a function of marketing.\textsuperscript{50} This is one of the ways in which marketing adds to the capacity of the economic system and provides one explanation for the dual character of marketing expenditure.

The other way in which marketing increases the supply of labour is via its effect on the productivity of the labour force. Here the basic hypothesis is that marketing induces labour to demand and search for higher money wages in an attempt to increase its real wage.\textsuperscript{51} There are several ways in which this leads to increases in the productivity of labour. In the first place higher

\textsuperscript{49} See earlier reference to Mack's article on pp.77-80 above and to Purk's \textit{Consumption Economics} on p.6 above.

\textsuperscript{50} It was argued above that marketing influences income from the aggregate demand side. Here the argument is that marketing influences income from the aggregate supply side.

\textsuperscript{51} This hypothesis is incorporated into a general Phillips Curve Model and tested in chapter 6 of this thesis. The empirical results show that marketing is a significant variable in explaining the change in money wage rates. There are no previous empirical tests of this hypothesis.
money wage rates imply a change in relative factor costs which causes a substitution of capital for labour.\textsuperscript{52} The increase in the capital/labour ratio is one source of productivity increase.\textsuperscript{53} New capital embodies technological progress and this is another source of productivity increase. These two sources of productivity increases can be regarded as the traditional sources associated with cost push in the labour market, i.e., they occur regardless of the mechanism of wage push.

In chapter 1 of this thesis it was emphasized that there is an important distinction in the dominant mechanism of wage push in an affluent society compared to a developed society. In an affluent society the dominant mechanism of wage push is the "quit and search" process. This mechanism of wage push provides an explanation both for the effectiveness of marketing in forcing up the money wage rate and for the other two sources of productivity increases which this process gives rise to. These other two sources of productivity increase arise from the mobility and adaptability of the labour force, and from the increased education

\textsuperscript{52} Assuming a neoclassical production function where labour and capital are substitutable.

\textsuperscript{53} The marginal physical product of labour is increased since each unit of labour is combined with more of the fixed factor, capital.
and training of the labour force giving rise to technological progress embodied in labour.\textsuperscript{54} As noted in chapter 1 the quit and search process depends on a dynamic labour force which is willing

\textsuperscript{54}. This will be represented by a shifting up in the \textit{production} function relating output to labour, capital constant, and a shifting out of the marginal physical product curve (see figure 3.2 below).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure32.png}
\caption{Figure 3.2}
\end{figure}
to change jobs, to move up the job ladder, and to acquire the new skills, training and education, which is required to fill the new jobs created by technological progress. In a way the process is self generating and mildly explosive. Marketing effort induces workers to force up money wage rates. This causes the substitution of capital for labour and the introduction of new techniques embodied in capital. New jobs are created requiring new skills. Since the motivation for the wage push was the desire for higher incomes to purchase consumer goods, labour is willing to meet the demand for new skills. The increase in productivity allows businessmen to meet the demand for higher money wages without price increases. The real income of workers increase. The capacity of the economy has increased since the labour force measured in efficiency units has increased.

3.2.3 GROWTH WITHOUT TECHNOLOGICAL PROGRESS - A LABOUR APPROACH.

In developing their theory of growth neither Harrod nor Domar assumed an absence of technological progress. However, subsequent analyses of growth have found it convenient to develop the analysis first in terms of growth without technical progress.

55. Or to work harder at the same job or at a new job.

56. Assuming that the hike in money wage rates does not exceed the increase in productivity.
and then in terms of growth with technical progress. This procedure is followed here.

Assumptions.

Following Harrod and Domar it is assumed that all adjustments take place in the current period, i.e., there are no lags. The Harrod-Domar model assumes that both $\sigma$, the capital coefficient or output/capital ratio, and $a_1$, the mpc, are constant. In the present context it is assumed that $a_1$, $a_2$, and $s$, are


58. This section follows closely the Harrod-Domar model. Labour is the only explicit factor of production corresponding to capital being the only explicit factor of production in the Harrod-Domar model. The absence of labour in the production function and the assumption that $\sigma$ is fixed in the Harrod-Domar model implies that labour and capital must be combined in fixed proportions. Analogously, the absence of capital in the production function and the assumption that $s$ is fixed implies that labour and capital must be combined in fixed proportions. In this section, therefore, the capacity of the economy is assumed to increase in proportion to the physical increase in the labour supply. There is no capital/labour substitution and no productivity increases.
constant. These assumptions are not crucial to the results obtained and are made to keep the model simple.

Domar discarded the Classical/Neo-Marxian approach to growth because increases in the labour supply did not lead to increase in aggregate demand. What he called the capital approach to growth, as opposed to the labour approach, measures all increases in capacity via increases in the quantity and productivity of capital. Domar recognized however that the labour approach was superior from the point of view of measurement since labour is relatively more homogeneous and can be measured in its own units. This section reconstructs the Domar model using the labour approach with marketing rather than investment being the dynamic factor. The question to which Domar addressed himself was: How fast must investment grow to fully employ the growing capital stock? The question which this section of the thesis considers

59. \( a_2 = \frac{dc}{dM} \) is the change in consumption following a change in marketing expenditure. \( s \) is the marketing coefficient which is comparable to \( \sigma \) in the Harrod-Domar model. It is the increase in capacity accompanying each dollar of marketing expenditure.

60. "These results were obtained on the assumption that \( \alpha \), the marginal propensity to save, and \( \sigma \), the average productivity of investment, remain constant. The reader can see that this assumption is not necessary for the argument and the whole problem can be easily reworked with variable \( \alpha \) and \( \sigma \)." In Mueller, op.cit., p.283. For a modification of Domar's model where \( \sigma \) and \( a_1 \) are treated as functions of time, see A.C. Chiang, Fundamental Methods of Mathematical Economics (Mc Graw-Hill, 1967), pp.440-442.
is: How fast must marketing grow to fully employ the growing labour force?

Let $\bar{y}$ be the capacity or full employment level of output. Suppose that the change in capacity is proportional to the change in the labour force, I

$$\frac{d\bar{y}}{dt} = \bar{s}(dL/dt)$$

where $\bar{s}$ is the output/labour ratio. Let $M$ be the level of marketing expenditures.  Let $M^{'}$ be the level of marketing expenditures. Suppose that the increase in the labour force is proportional to $M$, $dL/dt = mM$. The supply equation can be rewritten as $\frac{d\bar{y}}{dt} = sM$ where $s = m\bar{s}$ is the marketing coefficient.

To maintain full employment of the growing labour force, aggregate demand must increase at the same rate as aggregate capacity, $\frac{dY}{dt} = \frac{d\bar{y}}{dt} = sM$.

---

61. Strictly speaking $M$ is the level of marketing expenditures net of depreciation on the marketing stock. This was previously defined as $M^{*}$. To simplify the notation the * is dropped in part 2 of this chapter.

62. Note that the increase in the labour force is proportional to the level of marketing not the change in marketing. This is because it is the change in society's "stock" of marketing which expands the capacity of the economy. $M$ represents the net addition to the marketing stock in the current period. This means that even if $dM/dt = 0$, $dL/dt$ will be positive as long as $M$ is positive.

63. In Domar's model $d\bar{y}/dt = \sigma I$ where $\sigma$ is sometimes referred to as the capital coefficient. $\sigma$ measures the increase in capacity associated with a change in the capital stock. In Domar's model $I = dK/dt$. In the present Model $\delta$ measures the increase in capacity associated with a change in the labour force and $M = (1/m)(dL/dt)$. To take an actual example, suppose that $M = $100.00 and this leads to an increase in the labour force of 20 man hours, $m = 1/5$. If it takes 3 units of labour measured in man hours to produce one unit of output, $\bar{s} = 1/3$, and $s = 1/15 (s = m\bar{s})$. 
As a first approximation, assume that the only source of exogenous increases in aggregate demand is marketing. The product market can be described by the following equations:

\[ C = a_0 + a_1 Y + a_2^M \]

\[ Y = C + M \]

\[ Y = a_0/(1-a_1) + ((1+a_2)/(1-a_1))M \]

Therefore \( \frac{dY}{dt} = ((1+a_2)/(1-a_1)) \frac{dM}{dt} \) is the rate of increase in aggregate demand. Full employment requires that:

\[ \frac{dY}{dt} = \frac{dY}{dt} \]

\[ ((1+a_2)/(1-a_1)) \frac{dM}{dt} = sM \]

\[ \frac{dM}{dt} = ((1-a_1)/(1+a_2))sM \]

which is a first-order linear homogeneous differential equation the solution to which is \( M = M_0 e^{((1-a_1)/(1+a_2))st} \). The latter equation describes the time path of the level of marketing that maintains full employment output. The required rate of growth of marketing is \( (1/M)(dM/dt) = ((1-a_1)/(1+a_2))s \). Making the further assumption that in steady state equilibrium the consumption function goes through the origin, the equilibrium rate of growth of income is the same as the rate of growth of marketing.

64. This is analogous to the Harrod-Domar assumption that the only source of exogenous increases in aggregate demand is investment.
i.e., \((1/Y)(dY/dt) = s((1-a_1)/(1+a_2))\).\(^{65}\)

The equilibrium rate of growth is \(s((1-a_1)/(1+a_2))\). Marketing must grow at the exponential rate \(s((1-a_1)/(1+a_2))\) to maintain full employment. If the mpc increases or if the coefficient \(a_2\) increases, the required rate of growth of marketing falls. If the marketing coefficient, \(s\), increases, the required rate of growth of marketing increases.

### 3.2.4 GROWTH WITHOUT TECHNOLOGICAL PROGRESS - A COMBINED CAPITAL/LABOUR APPROACH.

In Domar's model there is only one source of exogenous demand. This source is net investment. The increase in capacity which accompanies each dollar of investment is \(\sigma\). Assuming that \(\sigma\) and the mpc are constant over time, Domar gets the result that the maintenance of full employment requires investment to grow at the constant compound rate of \(\sigma(1-a_1)\), where \(a_1\) is the mpc. The time path of investment is given by the equation \(I = I_0e^{\sigma(1-a_1)t}\).

---

65. If \(C = a_1Y + a_2M\)

Then \(Y = ((1+a_2)/(1-a_1))M\)

Log \(Y = \log ((1+a_2)/(1-a_1)) + \log M\)

Differentiating with respect to time:

\((1/Y)(dY/dt) = (1/M)(dM/dt)\).
In the previous section it was assumed that marketing was the only exogenous source of aggregate demand. However, in on-going economies both investment and marketing are taking place. A realistic model should therefore incorporate the effects of both investment and marketing on the steady state solution. Following Domar, let us assume that the increase in capacity is proportional to the level of investment

\[
\frac{d\bar{Y}}{dt} = \sigma I
\]

Then, the total increase in capacity with marketing is

\[
\frac{d\bar{Y}}{dt} = \sigma I + sM
\]

The equations for the goods market are now

\[
C = a_0 + a_1 Y + a_2 M
\]

\[
Y = C + I + M
\]

\[
Y = \frac{a_0}{(1-a_1)} + \frac{1}{(1-a_1)} I + \frac{(1+a_2)/(1-a_1)}{M}
\]

From which it follows that

\[
\frac{d\bar{Y}}{dt} = \frac{1}{(1-a_1)} \left( \frac{dI}{dt} + \frac{(1+a_2)/(1-a_1)}{dM/dt} \right)
\]

The equilibrium condition for steady state growth is now

\[
\sigma I + sM = \frac{1}{(1-a_1)} \left( \frac{dI}{dt} + \frac{(1+a_2)/(1-a_1)}{dM/dt} \right)
\]

This section departs from the strict Harrod-Domar framework in that both capital and labour are now included in the production function. There is no assumption of right-angled isoquants. Indeed the specification of the increase in capacity equation as \(\frac{d\bar{Y}}{dt} = \sigma I + sM\) and the assumption that \(\sigma\) and \(s\) are constant imply perfect substitution of capital and labour. Again this particular specification must be regarded as a simplification. The model can be specified with \(\sigma\) and \(s\) being functions of time. But this would only complicate the results unnecessarily.
In steady state equilibrium the rate of growth of marketing must be equal to the rate of growth of investment. Denote this rate of growth by $\lambda$. Substituting into the steady state equilibrium condition

$$\begin{align*}
\sigma - I + s^M &= (1/(1-a_1)) \lambda I + \left((1+a_2)/(1-a_1)\right) \lambda M \\
\sigma - I + s^M &= \lambda \left((1/(1-a_1)) I + \left((1+a_2)/(1-a_1)\right) M\right)
\end{align*}$$

Therefore $\frac{dI}{dt} = \lambda_1 I$.

The time path of marketing follows $M = M_0 e^{\lambda_2 t}$.

Therefore $\frac{dM}{dt} = \lambda_2 M$.

Substituting into the steady state equilibrium condition

$$\begin{align*}
\sigma - I + s^M &= (1/(1-a_1)) \lambda_1 I + \left((1+a_2)/(1-a_1)\right) \lambda_2 M \\
\text{Therefore } (s - \left((1+a_2)/(1-a_1)\right) \lambda_2) M &= ((1/(1-a_1)) \lambda_1 - \sigma) I \\
\text{Therefore } \frac{M}{I} &= \frac{(1/(1-a_1)) \lambda_1 - \sigma}{s - \left((1+a_2)/(1-a_1)\right) \lambda_2}
\end{align*}$$

Since $a_1$, $a_2$, $s$, $\sigma$, $\lambda_1$, $\lambda_2$ are all constant in steady state equilibrium, $\frac{M}{I} = k$, where $k$ is some constant.

If $M = kI$

$$\log M = \log k + \log I$$

$$(1/M)(dM/dt) = (1/I)(dI/dt)$$
Therefore \( \lambda = \frac{\sigma I + sM}{(1/(1-a_1))I + ((1+a_2)/(1-a_1))M} \)

where \( \lambda \) is the required rate at which marketing and investment must grow to maintain full employment. The required rate of growth is larger the larger is \( \sigma \) and \( s \). The required rate of growth is smaller the larger is \( a_1 \) and \( a_2 \).

It is useful to compare this required rate of growth \( \lambda \), with the required rate of growth of investment when there is no marketing. Let us denote the required rate of growth of investment when \( M = 0 \), as \( \lambda_1 = (1/I)(dI/dt) = \sigma(1-a_1) \). From p.175 \( \sigma I + sM = \lambda ((1/(1-a_1))I + ((1+a_2)/(1-a_1))M) \). Multiplying this equation by \( \lambda_1 \) and substituting \( \lambda_1 = \sigma(1-a_1) \) on the right hand side gives us

\[
\lambda_1 (\sigma I + sM) = \lambda \sigma I + \lambda \sigma(1+a_2)M
\]

Dividing through by \( I \)

\[
\lambda_1 \left( \frac{\sigma + sM/I}{\sigma + \sigma(1+a_2)(M/I)} \right) = \lambda \sigma + \lambda \sigma(1+a_2)(M/I)
\]

Therefore \( \lambda = \frac{\left( \frac{\sigma + sM/I}{\sigma + \sigma(1+a_2)(M/I)} \right) \lambda_1}{\left( \frac{1 + (s/\sigma)(M/I)}{1 + (1+a_2)(M/I)} \right) \lambda_1} \)

This shows that the relation between \( \lambda \) and \( \lambda_1 \) depends on the size of \( s/\sigma \) relative to \( (1+a_2) \). If \( s/\sigma < (1+a_2) \), \( \lambda < \lambda_1 \) and the required rate of growth of investment to maintain full employment is lower when marketing is included in the model.

Since \( a_2 > 0 \), \( (1+a_2) > 1 \). If \( s < \sigma \), \( s/\sigma < 1 \), \( (1+a_2) > s/\sigma \) and \( \lambda < \lambda_1 \).

68. This is the steady state condition given by the Harrod-Domar model.
A priori, we would expect that \( s < \sigma \), i.e., the increase in capacity accompanying each dollar of marketing is less than the increase in capacity accompanying each dollar of investment. In this case \( \lambda < \lambda_{I} \), so that the inclusion of marketing implies that a lower rate of growth of investment is required to maintain full employment.

Without empirical evidence, the possibility of \( s > \sigma \) cannot be ruled out. However, even if \( s > \sigma \), it does not follow that \( \lambda > \lambda_{I} \). This asymmetry in the results follow from the fact that each dollar of marketing adds to aggregate demand not only directly but via its effect on the consumption function. Only if \( s \) is sufficiently greater than \( \sigma \) so that \( s/\sigma > (1+a_{p}) \), is \( \lambda > \lambda_{I} \) and the required rate of growth of investment greater when marketing is included in the model.

3.2.5 GROWTH WITH TECHNOLOGICAL PROGRESS.

Commenting on the labour approach to growth, Domar pointed out that the formula whereby capital should grow at the same rate as the increase in the labour force and its productivity was misleading in that it assumed productivity increase to be exogenous. "As Mrs. Robinson well remarked, 'The rate of increase in productivity of labor is not something given by nature,' Labour productivity is not a function of technological progress in the abstract, but technological progress embodied in capital goods..." (Domar, op. cit., 1946, p.139).

The Harrod-Domar model is subject to a similar criticism in that by developing its analysis of growth around a single input,
capital, it implicitly assumes that all technological progress is either exogenous or embodied in capital. The recent works of Schultz and Denison have suggested that a large part of total factor productivity increase is due to technological progress embodied in labour.

The inclusion of marketing explicitly into the analysis of growth provides a useful way of incorporating both technological progress embodied in capital and technological progress embodied in labour. Domar identified two sources of productivity increase. One source is the increase in the capital/labour ratio and the other source is technical improvement embodied in new machines. These two sources of productivity increase are incorporated in his definition of $\sigma$, the capital coefficient.


70. Note that although the Harrod-Domar model has subsequently been interpreted as a model with fixed technical coefficients, it is clear that Domar explicitly assumed the possibility of capital/labour substitution. For example, in his 1946 article, Domar argues that "Even without technological progress, capital accumulation increases labor productivity at least to a certain point, both because more capital is used per workman in each industry and because there is a shift of labour to industries that use more capital and can afford to pay a higher wage." (op.cit., p.139). In his 1947 article he says that "Finally, capital may be substituted for labor." (In Mueller, op.cit., p.279).
Denison, op.cit., identified several other sources of productivity increase. Two of these sources which will be considered in this chapter and incorporated in the marketing coefficient are those due to investment in human capital and mobility of labour.

Interaction Between the Sources of Productivity Increase.

Taking the two sources of productivity increase identified by Domar and adding the two sources identified by Denison gives us four sources of productivity increase. These are productivity increase due to increased capital intensity in production, embodiment of technical progress in new machines, investment in human capital, and shifts in the labour force from low productivity to high productivity areas.

Marketing has an impact on all four sources of productivity increase. To understand the mechanism through which marketing is able to influence increases in productivity, first it is necessary to understand the interrelation between the sources of productivity increase.

Economists became interested in identifying sources of productivity increase when tests of aggregate production functions found that a large part of the rate of growth in the United States could not be explained by the rate of growth of factor inputs. 71

Solow was one of the first economists to suggest that these empirical tests did not take into consideration technological progress embodied in new machines. Denison, op.cit., focused attention on the fact that these tests ignored technological progress embodied in labour.

While both Solow and Denison contributed to our understanding of the sources of productivity increase, their approach did not recognize the importance of interaction between the various sources. As Nelson, op.cit., p. 591 noted, "... it is quite clear that the effects upon GNP of the three principal contributors to growth of total factor productivity - technological change, improved educational standards and levels, and improved allocative efficiency - should not be viewed as independent."

The interaction between the sources of productivity increase is clearly brought out by the way in which marketing affects the growth process. As noted earlier, the basic hypothesis is that an increase in marketing induces workers to force up money wage rates. The rationale for this hypothesis is that workers have two ways in which they can increase their incomes. They can increase their supply of labour or they can demand higher wage


73. Higher education affects primarily new entrants into the labour force. However, retraining, on the job training, and mobility, are important sources of productivity increase embodied in labour. Therefore, unlike capital, embodied technical progress in labour is not restricted to new labour.
rates. 74

To the extent that workers are successful in forcing up money wage rates, producers are encouraged to substitute capital for labour. This has the effect of increasing the capital/labour ratio, and inducing technological progress embodied in new machines. This accounts for two of the four sources of productivity increase being considered. The other two sources arise from the interaction of technological progress embodied in new machines and new processes with investment in human capital and labour mobility. Most new processes require more highly trained, or at least newly trained, labour. The mechanism through which labour is able to force up money wage rates is the "quit and search" process. 75 To secure a wage increase in present occupations or to find a new job paying a better wage, workers are well aware that increased training and education is a distinct advantage. Workers are therefore often willing to increase or change their skills to secure wage increases. And producers often demand such skills as a condition for wage increases. As Nelson, op.cit., pp.591-592 points out:

74. Note that in the passage quoted previously Yancey pointed out that, "...the supply of labour might be increased by cutting leisure time if selling effort made the acquisition of goods sufficiently desirable and wage rates were not increased," (my italics). A priori, there is no reason why both ways of increasing income should not be taking place at the same time.

75. See Alchian, op.cit.
...The need for and the return to educated people generally, not just research and development personnel, are in large part functions, of the desired and actual rate of technological change... In the absence of technological change, economic decision-making could be more routine... The relatively high remuneration of people who can deal imaginatively with these problems, just as the high salaries of R&D scientists and engineers is in part, perhaps in major part, the reflection of the importance of technological change in economic growth. Should the pace of technological change diminish, the returns to higher education probably would also.

The sequence of events which has been suggested is the following. Marketing induces higher consumption goals. This in turn induces workers to secure higher incomes by increasing their supply of labour and by securing higher wage rates. To secure higher wage rates workers are willing to take risks by quitting and searching for better paid jobs, by investing their total capacity in the job to secure promotion, by investing in new skills, training, and education. To the extent that capital is substituted for labour and new techniques introduced, workers are willing to learn the new techniques to secure higher wages.

The Effect of Technological Progress on the Marketing Coefficient, s.

In the model without technological progress the change in capacity was defined as $dY/dt = σI + sM$. In such a model the capacity of the economy increases only because of the physical increase in the capital stock associated with $I$ and the increase in man-hours of labour associated with $M$.

It was observed earlier that Domar recognized two sources of productivity increase, one due to changes in the capital/labour ratio and the other due to technological progress embodied in
capital. Domar was careful to define $\sigma$ in such a way as to incorporate these two sources of productivity increase. In the model with technological progress therefore, $\sigma$ can be re-defined to incorporate the increase in capacity due to the physical increase in the capital stock, the increase in the capital/labour ratio, and technological progress embodied in new capital.

Marketing gives rise to four sources of productivity increase - increase in the capital/labour ratio, technological progress embodied in capital, technological progress embodied in labour, and labour mobility. Following Domar, these sources of productivity increase can be incorporated into the model by re-defining $\sigma$, the marketing coefficient to include all these sources of productivity increase in addition to the physical increase in the labour supply.

Domar justified his "all embracing" definition of $\sigma$ on the grounds of simplicity.

The use of $\sigma$ certainly does not imply that these other factors - natural resources, labor and technology - remain fixed. As a matter of fact, it would be very

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76. "$\sigma$ should not be confused with other related concepts, such as the traditional marginal productivity of capital. These concepts are usually based on *caeteris paribus* assumptions regarding the quantity of other factors and the state of technique. It should be emphasized that the use of $\sigma$ does not imply in the least that labor, natural resources and technology remain fixed. It would be more correct therefore to say that $\sigma$ indicates the increase in productive capacity which accompanies rather than which is caused by each dollar invested." In Mueller, *op.cit.*, p. 281.
interesting to explore the use of a more complex function as the right side of expression (2) instead of \( I \sigma \), a function in which the growth of labor, natural resources, and technology would be presented explicitly, rather than through their effects on \( \sigma \). I did not attempt it because I wished to express the idea of growth in the simplest possible manner. One must also remember that in the application of mathematics to economic problems, diminishing returns appear rapidly, and that the construction of complex models requires so many specific assumptions as to narrow down their applicability. (In Mueller, op.cit., p.285).

Domar's justification is even more applicable in the present case since the explicit inclusion of marketing into the growth model gives rise to four sources of productivity increase as opposed to Domar's two sources. In addition, while it would be interesting to construct a more complicated model which would identify separately the contribution to capacity of the increase in the labour force and each of the four sources of productivity increase, such a model, besides being beyond the scope of this thesis, would be of little practical use until some rough estimates of the magnitude of the increase in capacity from each source becomes available. Chapter 5 of this thesis provides a rough estimate of \( m \), where \( m = \left( \frac{1}{\sigma'} \right) (dL/dt) \), \( L \) being measured in man-hours. Since the marketing coefficient \( s \) is made up of two components \( \tilde{s} \) and \( m \), productivity increase can be viewed as augmenting either \( \tilde{s} \) or \( m \). For example, if \( L \) is measured in man-hours as in chapter 5 of this thesis, \( m \) measures the physical increase in \( L \) associated with \( M \) and productivity increase can be viewed as augmenting \( \tilde{s} \) in the equation \( d\tilde{y}/dt = \tilde{s} (dL/dt) \). Alternatively, if \( L \) is mea-

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77. The estimate is necessarily crude since there is no data on total marketing expenditures.
sured in efficiency units, productivity increase can be viewed as augmenting the value of $m$ in the equation $\frac{dK}{dt} = mM$. This thesis does not attempt to estimate the magnitude of such productivity increase either in total or from each source separately. However, chapter 6 of this thesis provides an implicit test of whether such productivity increase does occur.

**Marketing and the Flexibility of the Harrod-Domar Model.**

The Harrod-Domar growth model is regarded as the simplest but most inflexible model which has been developed to analyse the growth process. An important reason for the inflexibility of the Harrod-Domar model is that the model approached the problem of growth exclusively from the side of a single input, capital. The result was that the model is interpreted to have a production function with fixed technical coefficients, thus allowing no substitution between capital and labour.\(^{78}\) Hence, steady state growth is only possible if the exogenously given rate of growth of labour is equal to the required rate of growth of the capital stock, i.e., $n = \sigma(1-\alpha)$ where $n$ is the rate of growth of labour.

The inclusion of marketing in the Harrod-Domar growth model implies that labour supply is no longer exogenous. If $n$ is endo-

\(^{78}\) It was argued above that Domar explicitly assumed capital/labour substitution. However, as Chiang, *op.cit.*, p.451 has noted, the assumption of a constant $\sigma$ and, "The absence of a labor input in the production function carries the implication that labor is always combined with capital in a fixed proportion, so that it is necessary to consider explicitly only one of these factors of production."
genous this provides some flexibility in the Harrod-Domar model even if the assumption of fixed technical coefficients is maintained. However, once technological progress is included in the model it becomes inconsistent to continue the assumption of fixed technical coefficients, since one of the sources of productivity increase is the substitution of capital for labour.\textsuperscript{79} The latter implies that the production function should be of the more general form \( Y = f(K, L) \) and flexibility in the model is introduced from two sources - capital/labour substitution and endogeneity of \( n \). Flexibility arising out of capital/labour substitution takes us out of the Harrod-Domar framework and into Neoclassical growth models.\textsuperscript{80} It is therefore not considered in this thesis. The rest of this chapter suggests ways in which marketing increases the flexibility of the Harrod-Domar model other than through the substitution of capital for labour in the production function.

Marketing and the Knife-Edge Problem.

In introducing marketing into the Harrod-Domar model, the

\textsuperscript{79} This perhaps explains why Domar did not assume a fixed capital/labour ratio since he did not rule out technological progress from his model. The problem of a rising capital/labour ratio as a source of productivity increase is circumvented in current interpretations of the Harrod-Domar model with technological progress, by assuming that all technological progress is exogenous and Harrod neutral. This means that technological progress is labour augmenting. Therefore, while \( K/L \) increases if \( L \) is measured in physical units \( K/L \) remains constant if \( L \) is measured in efficiency units.

analysis so far, followed more closely Domar’s approach to the problem of growth rather than Harrod’s. The problem of the knife-edge, however, is better dealt with from the side of demand, and therefore Harrod’s approach is more appropriate.

The stability of a steady-state growth path can be regarded as a separate issue from the equilibrium condition defining the steady-state solution. Stability has to do with the direction of change of the system, either away from or towards the steady-state solution, outside of equilibrium. In terms of the Harrod-Domar model, the variable which propels the system, both in equilibrium and outside equilibrium, is the level of investment. Up to this point of the analysis, it was not necessary to specify the nature of the investment function. Investment could have been assumed to be exogenous. Similarly, it was not necessary to specify the nature of the marketing function. Marketing could have been assumed to be exogenous. However, the nature of the investment function is crucial to analysing the stability of the steady-state solution.

The investment function specified by Harrod is that based on the accelerator theory, \( I_t = C_r(Y_t - Y_{t-1}) \) where \( C_r \) is the capital requirements for additional output. Assuming \( C_r \) constant and no exogenous investment, this theory suggests that the level of investment is determined by the rate of growth of output. Denote the rate of growth of output by \( G \). Then
\[ I_t = C_r((Y_t - Y_{t-1})/(Y_{t-1}))Y_{t-1} = C_r G Y_{t-1}. \]
This is the starting point of Harrod’s analysis. Producers invest because output is
However, investment has two effects on the economy. It adds to aggregate demand via the multiplier and to aggregate capacity by increasing the capital stock. There is only one rate of growth of output which will induce a level of investment via the accelerator, which will lead to a growth in aggregate demand equal to the growth in capacity. This Harrod called the warranted rate of growth denoted by \( G_w \). If \( G > G_w \) investment adds more to aggregate demand than to aggregate capacity. If \( G < G_w \) investment adds less to aggregate demand than to aggregate capacity.

Instability in the model follows from producer behaviour underlying the investment function. The reason producers are investing is to add to capacity to meet the growth in demand. When \( G > G_w \) producers find that the growth in capacity is insufficient so they invest even more. But this only makes the situation worse. Alternatively, if \( G < G_w \) the growth in capacity exceeds what is required and producers invest even less.

The analysis of marketing behaviour described in part 1 of this chapter suggests that marketing might work in the opposite direction to that of investment. As more and more producers adopt the "task" method of determining their marketing budget as opposed to the "percentage of sales" method, the more will marketing expenditures be allocated to the task of expanding aggregate demand. Given this assumption, producers are likely to vary their

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91. It refers only to net investment. Depreciation is ignored.
marketing expenditures in response to a divergence between $G$ and $G_w$ in the opposite direction to their variation of investment. Thus if $G > G_w$, aggregate demand exceeds productive capacity. Rational behaviour indicates a reduction in marketing expenditures since this will reduce aggregate demand. This reduction in marketing should offset to some extent the increase in investment, the objective of which is to increase capacity, but which in practice worsens the disequilibrium between $G$ and $G_w$. Similarly, when $G < G_w$, rational behaviour indicates an increase in marketing which would counteract the reduction in investment and make the system more stable.

However, it does not follow that this is necessarily stabilizing. Since a dollar of marketing expenditure adds both to aggregate demand and aggregate supply any reduction in marketing expenditure in an excess demand situation would also reduce the addition to capacity. The process will only be stabilizing if the reduction in additional capacity is less than the reduction in aggregate demand.

**Endogenous Labour Supply and the Knife-Edge Problem.**

The analysis above suggests that the introduction of marketing into the Harrod-Domar model may reduce the instability of the model from the demand side. Because marketing also makes the labour supply endogenous\(^2\) greater flexibility is introduced.

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\(^2\) Endogeneity of the labour supply in this thesis should not be confused with endogenous population growth characteristic of Classical growth models. In this thesis the rate of growth of population is assumed to be exogenous. However, given the population, marketing affects the number of man hours of labour supplied and the productivity of the labour supplied.
from the supply side. Flexibility is introduced into the model through variability in the marketing coefficient \( s \), outside equilibrium.

In the Harrod-Domar model, the capital coefficient, \( \sigma \), is assumed to be fixed. The implication is that the labour requirements coefficient, \( \tilde{s} \), must also be assumed fixed. However, this does not imply that the marketing coefficient \( s \), is fixed. Since \( s = m \tilde{s} \), where \( m \) is defined in the equation \( dI/dt = mM \), if \( m \) is variable, \( s \) will be variable.\(^{83}\)

The nature of the analysis suggests that \( m \) will be variable outside steady-state equilibrium, and that the variability of \( m \) will be in such a way as to move the system in the direction of the steady-state path.

The coefficient \( m \) is made up of a combination of direct increases in the labour supply due to marketing, and productivity increases induced by the upward pressure on money wage rates caused by marketing. Consider the direct increase in the labour supply first. If the actual rate of growth of income exceeds the warranted rate, \( G > G_w \), there is excess demand and inflationary pressures in the economy. Since employment opportunities are high, the increase in the labour supply which accompanies each dollar of mar-

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\(^{83}\) \( \tilde{s} \) is defined as the output/labour ratio in the equation \( d\tilde{y}/dt = \tilde{s}(dL/dt) \).

\(^{84}\) Note that in the Harrod-Domar model a fixed output/capital ratio implies \( \sigma \) fixed because \( dK/dt = I \).
marketing is likely to be greater, than when employment opportunities are worse. This suggests that \( m \) varies directly with the extent to which \( G \) exceeds \( C_w \). This means that marketing is stabilizing in that in times of excess aggregate demand each dollar of marketing adds more to capacity than in times of deficient aggregate demand. \(^{85}\)

The second source of labour increase is via the productivity increases resulting from the upward pressure on money wage rates. The mechanism through which labour is able to achieve its claims for higher wages is the "quit and search" process. When \( G > C_w \), more workers will be willing to quit and search for higher wage rates than when \( G < C_w \). If more workers are willing to quit and search when \( G > C_w \), money wage rates will rise faster inducing higher rates of productivity increases from the four sources identified above. Again the process is stabilizing in that \( m \) varies directly with \( G-C_w \).

Conclusion.

The second part of this chapter analysed marketing within the context of the Harrod-Domar growth model. One of the assumptions of the Harrod-Domar model is fixed technical coefficients in production. It was argued throughout that the fixed technical coefficients assumption is best regarded as a simplifying assumption which makes the Harrod-Domar model a useful analytical technique.

\(^{85}\) There may be some offset here in that \( a_o = \frac{\partial G}{\partial M} \) may also increase during an inflation. However the direct addition to aggregate demand, \( M \), will remain the same per dollar.
for introducing new ideas in dynamic economics. Thus the question
of capital/labour substitution, recognised by Domar as a source of
productivity increase, was ignored in the interest of simplicity.
The introduction of marketing into the analysis of growth high-
lights the complementary nature of the sources of productivity in-
creases. A rising capital/labour ratio is matched by increased
training, education, and adaptability of the labour force. The
process can be viewed as labour increasing when labour is measured
in efficiency units to maintain a relatively constant capital/
efficiency-labour ratio.

Whether or not the capital/labour ratio is constant, however
labour is measured, the purpose of this chapter was not to focus
attention on the effect of marketing on capital/labour substitu-
tion in the growth process. The effect of capital/labour substi-
tution has already been investigated in the more complex neoclassi-
cal models of growth. The objective, rather, was to introduce
marketing into the theory of growth in the simplest possible way.
This is the justification for choosing the Harrod-Domar framework.

Marketing has hitherto been neglected by economists in the
analysis of growth. As a contributory factor in the growth pro-
cess it affects both aggregate demand and aggregate capacity. In
this respect its impact on the growth process is similar to in-
vestment. Quantitatively, its significance is at least as great
as investment as far as its contribution to aggregate demand
goes. Its effect on capacity is more indirect than investment
and therefore its quantitative significance requires more so-
phisticated investigation. However, the increased willingness of
labour to sacrifice leisure in recent years, and the increasing
attention being focused on technological progress embodied in la-
bour suggests that the quantitative effect of marketing on capacity
is significant.

Marketing provides a theoretical rationalization for the
observed relative stability of the growth process in the post-
war period compared to the predictions of the Harrod-Domar model.
The model with marketing predicts that while in steady-state
equilibrium the rate of growth of marketing and investment would
be equal, in times of excess aggregate demand the rate of growth
of investment would be greater than the rate of growth of marketing,
and in times of deficient aggregate demand the rate of growth of
investment would be less than the rate of growth of marketing.
On the supply side the model predicts that marketing will add
more to the rate of growth of capacity in times of excess aggre-
gate demand than in times of deficient aggregate demand.
CHAPTER IV

ESTIMATION OF THE CONSUMPTION FUNCTION.

This chapter discusses the empirical results obtained from applying regression and econometric techniques to various models designed to test the aggregate consumption function of the U.S. with time-series data for the period 1947-1972 inclusive. The innovative element of this study is the introduction of various indices of marketing activity to test the hypothesis that an increase in marketing activity leads to an upward shift in the aggregate consumption function over time.

Two basic types of models are used. These are single equation models involving a single stochastic equation and simultaneous equation models involving an interdependent system of stochastic equations. Both types of models are simple versions of the static Keynesian model as modified in chapter 3 part 1, to take account of the effect of marketing on aggregate consumption. As explained in chapter 3, these models deal exclusively with the expenditure or goods sector. The monetary, labour and production sectors have been omitted to keep the models small and manageable. Since the models are also one-sector models, relative prices play no role.

Estimation Techniques.

The advantage of using single equation models is that classical regression techniques can be applied, and if the equation is assumed to be linear as in the present case, ordinary least squares (OLS) can be used.

With regards to simultaneous equation models there are several
consistent estimators available.\textsuperscript{1} The most widely used estimation technique for simultaneous equation models is two stage least squares (2SLS).\textsuperscript{2} The 2SLS technique can be applied to both just-identified and over-identified equations. It has the important advantage, compared with other consistent estimators, of being relatively robust, i.e., less sensitive to multicollinearity, autocorrelation, observational errors and other problems associated with the sample data. This advantage is particularly important in cases of relatively small sample size. 2SLS is used in the present study to estimate the coefficients of the simultaneous equation models.

### OLS and 2SLS Compared as Estimators for the Consumption Function.

Ever since the classic article by Haavelmo,\textsuperscript{3} economists have recognized that the estimation of the aggregate consumption function in single equation models produces a biased estimate of the marginal propensity to consume. This has led to subsequent estimation of the consumption function within the framework of simultaneous equation models.

There is another reason why it might be thought more appropriate to use a simultaneous equation model in the present study rather than a single equation model. In a simultaneous equation

\begin{enumerate}
\item A consistent estimator is an estimator which is asymptotically unbiased.
\item See Johnston, Econometric Methods, op. cit., p. 380.
\end{enumerate}
model, an equation can be specified for marketing to remove any possible simultaneity bias in the coefficient estimate for marketing in the consumption function.

It is for these reasons that simultaneous equation models are used to test the aggregate consumption function in the present study. However, what is not pointed out often enough in the literature on the consumption function is that OLS has a number of advantages which might more than offset its supposed limitations vis-a-vis 2SLS. Consider for example a consumption function of the form $C_t = \alpha_0 + \alpha_1 Y_{dt} + \alpha_0 C_{t-1}$. Evans, op. cit., p.48, notes that this is one of the most commonly estimated forms of the consumption function. There are several reasons why OLS may provide better estimates for a consumption function of this form than 2SLS.

Firstly, there are two sources of bias in the OLS estimates which tend to offset each other. There is the simultaneity bias due to the correlation of $Y_d$ with the error term. This produces and upward bias in the coefficient estimate for $Y_d$ and consequently a downward bias in the coefficient estimate for $C_{-1}$. There is a distributed lag bias due to the correlation of $C_{-1}$ with the error term. This produces an upward bias in the coefficient estimate for $Y_d$. While it is extremely unlikely that these two sources

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4. Evans, op. cit., p.53. Note that Evans must be assuming positive serial correlation of the disturbances. If the disturbances are random the OLS estimate of the coefficient for $C_{-1}$ is consistent but will have a negative small sample bias. With positive autocorrelation the OLS bias becomes positive (see Johnston, op. cit., p.308). This positive bias is proportional to $\rho$ and inversely proportional to the size of the coefficient estimate for $C_{-1}$. See Zvi Griliches, "A Note on Serial Correlation Bias in Estimates of Distributed Lags," Econometrica, Vol. 29, No. 1 (Jan. 1961), pp.65-73.
of bias will exactly cancel each other out, there is no reason to suppose that the bias which remains will be any worse than the distributed lag bias which remains in the 2SLS results. In any case, the a priori expectation is that the OLS results will show an upward bias in the coefficient estimate for \( Y_d \) and a downward bias in the coefficient estimate for \( C_{-1} \). The 2SLS results, on the other hand, will show an upward bias in the coefficient estimate for \( C_{-1} \) and a downward bias in the coefficient estimate for \( Y_d \).

Consider another econometric problem associated with the estimation of a consumption function of the form

\[
C_t = a_0 + a_1 Y_d + a_2 C_{t-1}.
\]

Since \( Y_d \) and \( C_{-1} \) are highly correlated, multicollinearity is a serious problem in attempting to estimate this function. While the problem of multicollinearity affects the results obtained by all estimation techniques, the 2SLS estimates

5. Evans, op.cit., pp.53-54 says that in general the simultaneity bias will be greater than the distributed lag bias in cases where total consumption, as opposed to consumption excluding durables, is the dependent variable and where annual, as opposed to quarterly, data is being used. In the present study, therefore, the simultaneity bias is likely to exceed the distributed lag bias.

6. See previous footnote.
are likely to be affected more than the OLS estimates. The following comment by Evans, op.cit., p.51 is relevant.

In the case of the consumption function, both income and lagged consumption follow smooth upward patterns. Either variable could be used to explain a large part of the movements in consumption, and it is often not possible to sort out the independent contributions of each variable... In general, it has been the case that multicollinearity is more likely to distort these estimates calculated by more complex methods of estimation.

A final advantage of OLS over 2SLS is that OLS is useful as an exploratory estimator, i.e., to determine which variables should be excluded from the equation that is estimated. In a recent Monte Carlo Study, Carter showed that OLS performs better than 2SLS as an exploratory estimator.

Some Econometric Problems Associated With the Empirical Results.

As noted in the previous section the OLS results will be affected

7. A Monte Carlo Study by Quandt shows that the small sample bias obtained with OLS is almost invariably less than the 2SLS bias when there is substantial multicollinearity. R.E. Quandt, "Some Small Sample Properties of Certain Structural Equation Estimators," Research Memorandum No. 189, Economic Research Program (Princeton, Dec. 1962). While subsequent studies did not confirm the results of Quandt's study, Johnston, op.cit., p. 412 summarizes our present knowledge in the following way: "The one thing that is clear is that multicollinearity has an adverse effect on the bias of all estimators and in some cases it can narrow the difference between OLS and the consistent estimators."

by simultaneity bias and distributed lag bias. In addition there is bias due to errors of observation. The 2SLS results will be affected by distributed lag bias, bias due to errors of observation, and small sample bias.

Two further problems associated with simultaneous equation models are the proper specification of the model and identification. In the present study model specification is guided by existing studies and theoretical considerations. Two basic types of simultaneous equation models have been specified. One model assumes that investment is exogenous. The other specifies an equation for investment.

With regards to identification, unless a model is identified it is not possible to estimate the structural parameters since several structures will be consistent with a given population distribution of observations. It is assumed in this study that the "order condition" is a sufficient condition for identification.\(^9\) The order condition provides us with a simple rule for ensuring

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\(^9\) "...it is usually safe to proceed as if the order condition were sufficient for identification, even though in strict logic it is not sufficient, because there is almost no prospect of encountering a real problem whose structure is such that all the relevant determinants are zero when the order condition is satisfied." Carl F. Christ, *Econometric Models and Methods* (John Wiley, 1966), p.322.
that an equation is identified.\textsuperscript{10}

For both OLS and 2SLS there are the further problems of multicollinearity and autocorrelation. Multicollinearity has two adverse effects on the empirical results. Firstly, it increases the standard errors of the coefficients thus reducing the precision of the estimates. This effect of multicollinearity sometimes has the unfortunate consequence that it leads investigators to drop variables incorrectly from an equation because their coefficients are not significant. The true situation may be not that the variable has no effect but that the particular set of sample data fails to pick up the effect.\textsuperscript{11} In the present study this consequence of multicollinearity is circumvented by specifying the variables to be included in the consumption function from \textit{a priori} or theoretical considerations and changing only the index of marketing in each equation.\textsuperscript{12}

\textsuperscript{10} In a linear model a simple way of ensuring that an equation is identifiable is to exclude a sufficient number of variables from that equation. The order condition states that the number of predetermined variables excluded from the equation must be at least as great as the number of endogenous variables included in the equation less one, i.e., \(k \geq g-1\), where \(k\) = number of predetermined variables excluded and \(g\) = number of endogenous variables included.

\textsuperscript{11} Johnston, \textit{op.cit.}, p.160.

\textsuperscript{12} This means in practice that multicollinearity affects our choice of what index of marketing gives us the most significant results for the coefficients of \(Y_0\), \(C_{-1}\), \(M\), and \(M_{-1}\) in the consumption function.
The other effect of multicollinearity is that it becomes difficult to separate the effect of each independent variable on the dependent variable and that the coefficient estimates become extremely sensitive to small changes in the sample data.\textsuperscript{13} In the case of the consumption function being estimated, the high correlation between $Y_d$ and $C_{-1}$ means that only the sum of the coefficients of $Y_d$ and $C_{-1}$ has any meaning since the values of the individual coefficients are likely to vary appreciably from one equation to the next.\textsuperscript{14} With regards to the other variables included in the consumption function, the problem of multicollinearity, while it exists, is less severe. The marketing variable is not as highly correlated with $Y_d$ or $C_{-1}$ as $Y_d$ and $C_{-1}$ are correlated with each other.\textsuperscript{15}

Very little can be done about the problem of multicollinearity except to find new sample data.\textsuperscript{16} To some extent, the different indices of marketing used in the present study does provide a variety of sample data which can help "to break the multicollini-

\textsuperscript{13} Johnston, op.cit., p.160.

\textsuperscript{14} See Evans, op.cit., p.51.

\textsuperscript{15} $r^2$ between $Y_d$ and $C_{-1}$ in the present study is 0.997. For the simultaneous equation model, where $Y_d$ is used in the second stage instead of $Y_d$ ($Y_d$ is obtained from the first stage of 2SLS), $r^2$ between $Y_d$ and $C_{-1}$ is 0.998. $r^2$ between $M_c$ and $Y_d$ and between $M_c$ and $C_{-1}$ is 0.94, $r^2$ between $A$ and $Y_d$ is 0.85, $r^2$ between $A$ and $C_{-1}$ is 0.86.

\textsuperscript{16} See Johnston, op.cit., p.164.
nearity deadlock."\(^7\) This is especially true as far as the correlation between \(Y_d\) or \(C-1\) with the marketing variable is concerned.\(^8\) To my knowledge, in existing tests of aggregate consumption functions which specify both \(Y_d\) and \(C-1\) as independent variables, nothing has been done about the multicollinearity problem. This is clearly brought out in the lengthy review of tests of consumption functions of the basic form \(C_t = a + bY_t + dC_{t-1} + u_t\) by Evans (\textit{op.cit.}, chapter 3) where he mentions the problem of multicollinearity and implicitly assumes that nothing has been done about this problem.

Autocorrelation or the interdependence of disturbances is another problem which affects the estimation of consumption functions from time series data. There are two basic ways to deal with the problem of autocorrelation. One is to re-estimate the equation using a technique designed to take account of the autocorrelation. The other is to re-specify the equation until the Durbin Watson (DW) statistic indicates an absence of autocorrelation.\(^9\) Carr suggested that autocorrelation should be regarded as a sign of mis-specification. He therefore urged re-specification rather

17. Ibid.

18. Note the large change in \(r^2\) between \(Y_d\) and \(M_e\), and between \(Y_d\) and \(A\) (n.15, above). Changes in the observation period also make a significant difference. For example, in the study by Taylor and Weiserbs, \textit{op.cit.}, they show an \(r^2\) of 0.96 between \(A\) and \(Y_d\), their period of observation being 1929-68 excluding the years 1942-45.

than using a technique to purge the model of autocorrelation.\textsuperscript{20}

In the present study a combination of the two treatments for autocorrelation is used. In the simultaneous equation models there is a choice of four basic types of model specifications.\textsuperscript{21} In addition, further possibilities are provided by the different indices of marketing. This means that equations can be selected on the basis of an acceptable DW statistic assuming that other criteria have been satisfied.\textsuperscript{22} Several of the 2SLS estimates do


\textsuperscript{21} Investment endogenous and investment exogenous provide two choices. Two different marketing functions are used in each case giving a total of four possibilities.

\textsuperscript{22} For example, "reasonable" values for the coefficient estimates of $Y_A$ and $C_{-1}$, correct signs and significance of coefficients.
show acceptable values for DW. These equations are therefore regarded as preferred to equations showing unacceptable values for DW, other things equal. However, most of the OLS results did not show acceptable values for DW. Some of the single

23. For \( n = 26 \) and \( v = 4 \) (plus a constant term), to test \( H_0: \rho = 0 \) against \( H_1: \rho > 0 \) at the .05 level of significance, \( D_0 = 1.06 \) and \( D_{11} = 1.76 \). Therefore any value of DW greater than 1.76 indicates an absence of autocorrelation.

Note however, that with lagged dependent variables in the equation the DW test is biased towards the value for a random disturbance term. As Johnston, op.cit., pp.307-309, has observed, the DW test continues to be applied to models with lagged dependent variables "for want of anything better." Evidence of the power of the DW test in inappropriate situations is provided in the article by L.D. Taylor and T.A. Wilson, "Three-Pass Least Squares: A Method for Estimating Models with a Lagged Dependent Variable," Review of Economics and Statistics, Vol. 46 (1964), pp.329-346. Considering only experiments with \( \rho > 0.6 \) in absolute value, Taylor and Wilson found that the DW test detected the presence of autocorrelation in 80 to 100 percent of the samples for most experiments.

Durbin has developed a large sample test for autocorrelation in models with lagged dependent variables. See J. Durbin, "Testing for Serial Correlation in Least-Squares Regression when some of the Regressors are Lagged Dependent Variables," Econometrica, Vol. 38 (1970), pp.410-421. Nothing is known about the small-sample properties of this test. The test is not available in the computer programs used in the present study. However, the test statistic for Durbin's test can be easily computed from the DW statistic. See section 4.2 below.

24. The DW values for the OLS results were generally in the indeterminate range.
equation models were therefore re-estimated using a technique to purge the model of autocorrelation. The technique used is the Wildtreth-Lu procedure which is described under operation code 67 in Massager'73 (SFU Computing Centre).

4.1 THE MODELS.

Variables and Data.

The following variables have been used either directly in the various equations or indirectly in deriving the variables used in the equations. These variables are described more fully in Appendix B.

\[
\begin{align*}
C &= \text{Real Consumption Expenditures.} \\
I &= \text{Real Gross Private Domestic Investment.} \\
G &= \text{Real Government Purchases plus net Exports.} \\
Y &= \text{Real Gross National Product.} \\
Y_d &= \text{Real Disposable Personal Income.} \\
W_G &= \text{Real General Government Gross Product.} \\
W_b &= \text{Real Labour Income in Business including Government Enterprise and including Imputed Labour Income of Proprietors.} \\
P &= \text{Real Property Income net of depreciation and corporate tax liability.} \\
S_c &= \text{Real net Corporate Saving.} \\
\tau_p &= \text{Real Indirect Business taxes and corporate tax liability plus statistical discrepancy less subsidies.} \\
D &= \text{Real Capital Consumption at replacement cost.} \\
d &= \text{Real Capital Consumption at Original cost.} \\
K &= \text{Real net Private Domestic Capital Stock (defined as cumulated net investment, } K_{1945} = 0). \\
M_e &= \text{Real Marketing Expenditures defined as the sum of advertising expenditures, } R^D \text{ expenditures and the estimated cost of consumer credit.} \\
A &= \text{Real Advertising Expenditures.} \\
P &= \text{Real Total Consumer Credit Balances Outstanding.} \\
R_c &= \text{Real Instalment Credit Extended.} \\
R_n &= \text{Real net Increase in Consumer Credit.} \\
T_t &= \text{Total Trademarks issued including renewals.} \\
T_n &= \text{New Trademarks issued.} \\
P &= \text{Total Patents issued.} \\
R&D &= \text{Real Expenditures on Industrial Research and Development.}
\end{align*}
\]
All variables with monetary values are given in billions of 1958 dollars. The other variables are given in their individual units. Some variables are taken from source in real values. Others were deflated by using an appropriate price index. Disposable income and consumer credit were deflated by the implicit price deflator for consumer goods. Advertising expenditure was deflated by the implicit deflator for gross national product.

Further details on the intermediate stages in processing the data from its original form to the final form used in the equations.

26. Evans, op. cit., pp. 56-57, says that it is important to use the consumption deflator to deflate disposable personal income. He notes that the Klein-Goldberger models and other studies have used the GNP deflator. This leads to an underestimate of the short-run mpc, an overestimate of the long-run mpc, and the implication that consumption is a function of wealth rather than income.

27. There is some question as to the correct deflator for advertising expenditure. In fact Telsor has argued that advertising in current prices is a better measure of the number of advertising messages received. L.C. Telsor, "Advertising and Cigarettes," Journal of Political Economy, Vol. 70 (Oct. 1972), pp. 471-490. Taylor and Weissberg, op. cit., experimented with advertising expenditure in current dollars, in current dollars per capita, in 1958 dollars and in 1958 dollars per capita. The values in 1958 dollars were obtained by deflating with the GNP deflator. They found that the best results not only in $52 but also in terms of the largest t-ratio for the coefficient of $Delta log at, are obtained when the advertising data are corrected for price changes but left as an aggregate." (p.650).
along with the data source, is given in appendix B.

The Single Equation Model.

The single equation model specifies an equation for consumption. There are several alternative specifications of the Keynesian consumption function. A particular form which has become increasingly popular is \( C_t = a_0 + a_1Y_{dt} + a_2C_{t-1} \). Some theoretical justifications for this functional form were given in chapter 3, part 1. Brown, in his study of the consumption function suggested that this functional form was the most suitable for investigating habit persistence and lags in consumer behaviour. In a study of consumer demand in the United States Houthakker and Taylor use lagged consumption to capture both habit persistence and stock adjustment. This form of the consumption function can also be reconciled with Friedman's Permanent Income Hypothesis.

The equation \( C_t = a_0 + a_1Y_{dt} + a_2C_{t-1} \) encapsulates received theory concerning the consumption function. The

28. For reviews of the various consumption functions which have been developed and tested see Robert Ferber, *A Study of Aggregate Consumption Functions*, National Bureau of Economic Research, Technical Paper 8 (1953); Suits, *op.cit.*; Evans, *op.cit.*, chapter 3; and Ferber, *op.cit.* (Dec. 1973).


31. See p.156.
purpose of this chapter is to develop and expand upon received theory by investigating the effect of marketing on the aggregate consumption function. The simplest way of doing this is to include some index of marketing activity, alongside disposable income and lagged consumption, in the behavioural equation. This method was experimented with previously by Yancey, op.cit., and by Taylor and Weiserbs, op.cit. As Taylor and Weiserbs (p.644) note, including marketing in the model in this way assumes that the effect of marketing on consumption is direct and that marketing alters the marginal rate of substitution of consumption for saving, presumably in favour of greater consumption.

It was noted in chapter 3, part 1, that theoretical considerations suggest that lagged marketing should also be included in the consumption equation. The inclusion of marketing lagged one period was experimented with previously by Yancey, op.cit.

The basic form of the consumption function with marketing activity is therefore \( C_t = a_0 + a_1 Y_t + a_2 M_t + a_3 C_{t-1} + a_4 M_{t-1} \) where \( M_t \) is some index of marketing activity in the current period.\(^{32}\)

\(^{32}\) It was argued in chapter 3, part 1 that consumption should be measured net of marketing costs. Data limitations make it impossible to separate total marketing expenditures from the other components of aggregate demand. In the empirical tests in this chapter, therefore, both aggregate consumption and aggregate investment are measured inclusive of marketing costs. However, note that in equation 9 where the consumption function is tested with \( C_n = C - M_o \) and \( C_{n-1} = C_{-1} - M_{e-1} \), the marketing coefficients are still highly significant.
The Simultaneous Equation Model with Investment Exogenous.

The simultaneous equation model with exogenous investment consists of four equations - the consumption equation, the marketing equation and two income identities. The consumption equation has already been specified for the single equation model.

The Marketing Equation.

Two marketing equations were derived in chapter 3, part 1. The first equation \( M_t = d_0 + d_1 Y_t + d_2 \Delta Y_t \) was based on uncertainty or a combination of uncertainty and a financial constraint. The other equation \( M_t = d_0 + d_1 Y_t + d_2 Y_{t-1} + d_3 M_{t-1} \) was based on the adaptation of the stock adjustment model to marketing expenditures. The equation based on the stock adjustment model is used in the empirical tests as specified in chapter 3. However, the equation based on uncertainty is adapted somewhat in the econometric model.

Suppose that marketing activity is a function of expected sales, \( M_t = a_0 + a_1 C^*_t \) where \( C^*_t \) is total consumption sales.\(^{33}\) If

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\(^{33}\) This alternative specification of the marketing equation has two features to recommend it. It takes into account uncertainty by relating marketing to expected sales. Secondly, by relating marketing only to consumption sales, rather than total aggregate demand, it provides a "closer" test of possible simultaneity bias in the relationship between consumption and marketing. It is not known whether this latter factor was a consideration in the advertising function specified by Taylor & Weiserba, op.cit., but as noted earlier Taylor & Weiserba used aggregate consumption instead of gross national product in their advertising function.
it is assumed that expected consumption follows a geometric lag
distribution the final form of the estimating equation is
\( y_t = \alpha_0 + \alpha_1 c_t + \alpha_2 y_{t-1} \).

The Income Identities.

The model contains two income identities, one defining \( y_d \)
and the other defining \( y \). The income identity for gross national
product is taken directly from the U.S. National Income accounts.\(^{35}\)
While the income identity for \( y \) requires no further explanation,
there are two problems associated with obtaining the proper accounting
identity for disposable income.

The first problem is that national income figures do not show
a clear-cut relationship between disposable income and gross na-
tional product. The second problem is that unlike the accounting
identity for gross national product where all the components of
this identity, \( Y = C + I + G \), are given in both current and real
dollar values, disposable income is only given in current dollars.

\[^{34}\] \( C_t = C_t + bC_{t-1} + b^2C_{t-2} + \ldots \) Lassoing \( C_t \) by one period and mul-
tiplying by \( b \) gives: \( bC^*_t = bC_{t-1} + b^2C_{t-2} + \ldots \). Therefore
\( C^*_t - bC^*_{t-1} = C_t \). \( M_t = \alpha_0 + \alpha_1 C^*_t \). Lassoing \( M_t \) one period and
multiplying by \( b \) gives: \( bM^*_t = b\alpha_0 + b\alpha_1 C^*_{t-1} \). Therefore
\( M_t - bM^*_{t-1} = \alpha_0(1-b) + \alpha_1 \alpha_1 C^*_{t-1} \). Substituting for
\( C^*_t - bC^*_{t-1} \), \( M_t - bM^*_{t-1} = \alpha_0(1-b) + \alpha_1 C_t \). Therefore
\( M_t = \alpha_0(1-b) + \alpha_1 C_t + bM^*_t \).

\[^{35}\] Data and sources of data are given in appendix B.
Since theoretical considerations lead us to deflate different components of gross national product by different price deflators an accounting identity which holds in terms of current values need not hold in terms of real values. The accounting identity for disposable income which is used in the present study is based on that suggested by Christ in his "A Simple Illustrative Model of the United States Economy, 1929-1941 and 1946-1959."

The basic accounting identity provided by the national income figures is \( Y = C + I + G \) where \( Y \) = gross national product, \( C \) = consumption expenditure, \( I \) = gross private domestic investment, \( G \) = government purchases of goods and services plus net exports. These figures are all given in constant (1958) dollars. The relationship between \( Y \) and \( Y_d \) is given by \( Y = Y_d + \tau_p + \tau_b + S_c + D \) where the latter variables are as on p. 205. Suppose we now define a new variable \( C_d \) where \( C_d = C - (\tau_p + \tau_b + S_c + D) \) then we can define an accounting identity in terms of \( Y_d \) instead of \( Y \).

\[
Y = C + I + G = Y_d + \tau_p + \tau_b + S_c + D
\]

Therefore \( Y_d = C + I + C_d \)

It is assumed that \( C, \tau_p, \tau_b, S_c \) and \( D \) are all exogenous.

36. See p. 206 above.

37. Christ, op. cit., chapter eleven.
Since the variables \( Y_d, t_b, t_h, S_c \) and \( D \) cannot be obtained directly from the national income accounts, they were computed from the following variables which were obtained from the national income accounts.

\[ 122 = \text{current disposable personal income.} \]
\[ 123 = \text{consumption deflator, } 1958 = 100. \]
\[ Y_d = 122/123 \]
\[ 113 = \text{current national income.} \]
\[ 114 = \text{current corporate tax liability.} \]
\[ 104 = \text{current general government compensation of employees.} \]
\[ 121 = \text{gross national product deflator.} \]

\[ W_b + p = (113-114-104)/121 \text{ where } W_b \text{ and } p \text{ are defined earlier.} \]

\[ S_c + t_p = W_g + W_b + p - Y_d \text{ where } W_g \text{ is as defined earlier.} \]

\[ D + t_b = Y - W_c - W_b - p. \]

The basic simultaneous equation model with exogenous investment is now complete and consists of the following four equations.

1. \[ C_t = a_0 + a_1 Y_{dt} + a_2 M_{t} + a_3 C_{t-1} + a_4 M_{t-1} \]
2. \[ M_t = d_0 + d_1 Y_t + d_2 Y_{t-1} + d_3 M_{t-1} \]
2a. \[ M_t = d_0 + d_1 C_{t} + d_2 M_{t-1} \]
3. \[ Y_{dt} = C_t + I_t + G_t \]
4. \[ Y_t = C_t + I_t + G_t \quad I, G_d \text{ and } G \text{ are exogenous.} \]

**The Simultaneous Equation Model With Investment Endogenous.**

The investment equation which is used in the empirical tests is based on the stock adjustment theory of investment behaviour.\(^{38}\)

\(^{38}\) For a description of this theory and the derivation of the investment function see chapter 3, part 1.
The function is $I_t = b_0 + b_1 Y_t + b_2 Y_{t-1} + b_3 Y_{t-1} + b_4 M_{t-1}$. The capital stock variable which is used in this equation is obtained by assuming that the capital stock in 1945 was zero and summing over net investment for the other years. Net investment is defined as $I - d$ where $d$ is real depreciation at original cost. The latter in turn is obtained by deflating depreciation at original cost in current dollars by the implicit price deflator for gross private domestic investment, 1958 = 100. Thus $K_{1946} = I_{1946} - d_{1946}$, $K_{1947} = K_{1946} + I_{1947} - d_{1947}$ and so on.

The basic simultaneous equation model with endogenous investment consists of the following five equations.

1. $C_t = a_0 + a_1 Y_{dt} + a_2 M_t + a_3 C_{t-1} + a_4 M_{t-1}$
2. $I_t = b_0 + b_1 Y_t + b_2 Y_{t-1} + b_3 Y_{t-1} + b_4 M_t$
3. $M_t = d_0 + d_1 Y_t + d_2 Y_{t-1} + d_3 M_{t-1}$
3a. $M_t = d_0 + d_1 C_t + d_2 M_{t-1}$
4. $Y_{dt} = C_t + I_t + G_t$
5. $Y_t = C_t + I_t + G_t$  $G_d$ and $G$ are exogenous.

4.2 THE EMPIRICAL RESULTS.

The empirical results are presented in table 4.1. For each equation, table 4.1 provides the coefficient estimates and their respective $t$-values, the coefficient of determination ad-

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39. This procedure was used by Christ in his illustrative model referred to above (see Christ, op.cit., p. 289) and in the Wharton EFU Model (see Evans, op.cit., p. 440).
justed for degrees of freedom (52), the Durbin-Watson statistic, the sum of the coefficients for $X_d$ and $C_{-1}$ for these equations where both of these variables are used, and the variance of $C_{-1}$.

The empirical results clearly support the hypothesis that marketing has a significant positive effect on the level of consumption. The coefficient for $X_1$ is positive in all equations.

The $V(C_{-1})$ is required to enable us to use the new test for autocorrelation for models with a logged dependent variable suggested by Durbin, op. cit. Denote Durbin's test statistic by $h$. Then $h = r (\frac{n}{1-nV})^{1/2}$ where $r \geq 1$ DW, $n$ is the number of observations and $V$ is the variance of $C_{-1}$. The hypothesis of zero autocorrelation is rejected at the .05 level if

$h > 1.645$ (Johnston, op. cit., pp. 312-313). It is seen from the formula that the value of $h$ depends not only on the value of DW but also on the variance of $C_{-1}$. A simple way of checking whether the decision to accept $\rho = 0$ on the basis of the DW statistic is correct would be to set $h = 1.645$ and solve for $V$ using $DW = D_0 = 1.76$. A correct decision would be made if the estimate of $V$ in the regression equation is less than this critical value of $V$.

\[
\begin{align*}
\frac{n}{1-nV} & : h/r = (\frac{n}{1-nV})^{1/2} : (h/r)^2 = (\frac{n}{1-nV}) \\
(r/h)^2 & = (\frac{1-nV}{n}) : n(r/h)^2 = 1-nV : nV = 1 - n(r/h)^2 \\
V & = 1/n - (r/h)^2. \text{ Substituting } n = 26, h = 1.645 \text{ and } \\
r & = 1 - \frac{1}{2}(1.76) = .12 : V = 1/26 - (.12/1.645)^2 \\
& = 0.0385 - 0.00532 \\
& = 0.033.
\end{align*}
\]
and is significant at the .05 level \(^{41}\) in 23 out of the 32 equations shown in Table 4.1 which have some index of marketing as one of the independent variables.

**Model 1.**

The equations corresponding to model 1 are 1, 1a, 1b, and 1c. This model uses marketing expenditures as the index of marketing. Equation 1 gives the OLS results. The values for the coefficients for \( Y_d \) and \( C_{-1} \) are reasonable \(^{42}\) and both coefficients are significant. However, since the DW statistic is in the indeterminate range, the equation was re-estimated using the Wildstrom-Lu procedure. Equation 1a gives the new results.

Comparing the OLS with the 2SLS results in model 1 we see that as far as the marketing variables are concerned there is no significant difference in the results. However, there is some difference with regards to the coefficient estimates for \( Y_d \) and \( C_{-1} \). The results tend to support our a priori expectation that the 2SLS estimates would show an upward bias in the coefficient estimate for \( C_{-1} \) and a downward bias in the coefficient estimate.

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41. To test the hypothesis \( H_0: M = 0 \) against the alternative hypothesis \( H_1: M > 0 \), the critical \( t \)-value is, \( t_{.05(21)} = 1.72 \).

42. For a comparison of the coefficient values obtained in other empirical tests of aggregate consumption functions for the United States, see Evans, *op.cit.*, p. 52 and pp. 56-57.
for \( Y_d \).\(^{43}\) As expected, the sum of the coefficients for \( Y_d \) and \( C_{-1} \) are not significantly different.

The coefficient for lagged marketing is negative and significant in all four equations.\(^{44}\) This supports the hypothesis that marketing in period \( t-1 \) has the effect of shifting consumption from period \( t \) to period \( t-1 \).\(^{45}\)

Model 2.

The equations corresponding to model 2 are 2, 2a, 2b, 2c, 2d and 2e. The index of marketing used in model 2 is advertising expenditures. As in model 1, equation 2 was re-estimated to purge the OLS results of autocorrelation. Comparing equation 2a with equation 1a we see that there is very little change in the coefficient estimates for \( Y_d \) and \( C_{-1} \). There is also little to choose between \( M_0 \) and \( A \) as indices of marketing as far as the OLS results are concerned.\(^{46}\)

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43. The bias is more noticeable in equation 1a where investment is exogenous. However, although the coefficient values in equation 1c are closer to the OLS values, neither coefficients are significant in equation 1c. The change in coefficient values for \( Y_d \) and \( C_{-1} \) are "reasonable" when compared with other empirical results. See Evans, op.cit., pp.51-52.

44. Since this is a two-tailed test the critical t-value is \( t_{0.025(21)} = 2.08 \).

45. See Yancey, op.cit., p.70.

46. Both \( M_0 \) and \( M_{0-1} \) and \( A \) and \( A_{-1} \) are highly significant. The coefficient value for \( A \) is 2.67 times the coefficient value for \( Y_d \) and the coefficient value for \( A_{-1} \) is 2.55 times the coefficient value for \( M_{0-1} \). This is what we would expect since marketing expenditures average approximately 2.5 times advertising expenditures over the period 1947-72 (see table 1.2, p.39).
Turning to the 2S2S results, equation 2b gives the results when investment is exogenous and the marketing equation is based on the stock adjustment model. Comparing equation 2b with equation 1b we see that the difference between the 2S2S and 2SLS estimates for $Y_d$ and $C_{-1}$ are even greater when advertising is used as the index of marketing, i.e., the distributed lag bias is more noticeable when advertising is used as the index of marketing. This must be due to the difference in $r^2$ between $k_e$ and $Y_d$ and $C_{-1}$ and between $\Lambda$ and $Y_d$ and $C_{-1}$.\(^{47}\) There is little difference in the sum of the coefficients for $Y_d$ and $C_{-1}$ between equations 1b and 2b.

The same pattern is seen when going from equation 2b to equation 3b as in model 1. With exogenous investment there is less bias in the coefficient estimates for $Y_d$ and $C_{-1}$ but neither coefficients are significant. Indeed, the t-values for all variables fall in equation 3c compared to equation 3b. While this is also true in model 1, both $k_e$ and $M_{e-1}$ continue to be significant in equation 1c. In equation 3c $\Lambda$ is significant but $A_{-1}$ is not.\(^{48}\) The general conclusion therefore, is that marketing expenditures perform better as an index of marketing than advertising expenditures, in the simultaneous equation model.

\(^{47}\) These $r^2$ values are given on p. 201, p. 15, above.

\(^{48}\) The observed t-value for $A_{-1}$ is $-1.03$. This means that $A_{-1}$ is significant for a one-tailed test $-t_{0.05}(21) = 1.72$ but not for a two-tailed test $-t_{0.025}(21) = 2.08$. \(\)
Consider finally, equations 3d and 3e where a different equation for marketing is used. Comparing equations 3b and 3d where investment is exogenous, the distributed lag bias is even greater and the coefficient for $¥_d$ is not significant with the new equation for marketing. i.e., the stock adjustment model for marketing performs better than the uncertainty model. However, with regards to the marketing variables $A$ and $A_{-1}$ there is little to choose between the two models. Both show $A$ and $A_{-1}$ to be highly significant.

Comparing equations 2c and 2e where investment is endogenous equation 2e is preferred from the point of view of the coefficient values obtained for $¥_d$ and $A_{-1}$. However, in neither equations 2c nor 2e are these coefficients significant.\(^{49}\) Turning to the marketing coefficients, equation 2e is preferred on the basis of higher $t$-values for both $A$ and $A_{-1}$. Equation 2e is also preferred on the basis of the DW statistic.\(^{50}\)

The overall conclusions which can be drawn from the results of models 1 and 2 are the following. OLS provides better individual estimates for $¥_d$ and $A_{-1}$ than 2SLS. However, the OLS estimates need to be purged of autocorrelation. Both $M_0$ and $A$ perform equally well as indices of marketing in the single equa-

\(^{49}\) Note also that the same pattern of "better" coefficient values for $¥_d$ and $A_{-1}$ but worse $t$-values as we go from the model with investment exogenous to the model with investment endogenous is observed in equations 2d and 2e.

\(^{50}\) In equation 2e the DW value indicates an absence of autocorrelation. In equation 2e the DW value indicates positive autocorrelation.
tion models. In the simultaneous equation models \( M_e \) provides a better index than \( I \), and the stock adjustment model of marketing behaviour performs better than the uncertainty model. In the models with exogenous investment the observed bias in the individual estimates of \( Y_d \) and \( C_{-1} \) are larger, but the associated t-values are better, than in the models with endogenous investment. All equations show good \( R^2 \) values and reasonable values for the sum of the coefficients for \( Y_d \) and \( C_{-1} \). The sign of the coefficient for \( M \) is positive in all cases and significant in nine out of ten equations. The offending equation is 2e where investment is endogenous and the marketing equation is based on the uncertainty model. The sign of the coefficient for \( M_{-1} \) is negative in all cases and significant in eight out of ten equations. The two offending equations are 2a and 2e where investment is endogenous.

Model 3.

The equations corresponding to model 3 are 3, 3a, 3b and 3c. This model uses a principal components index of marketing. The original variables are advertising expenditures, consumer credit balances outstanding and expenditures on industrial research and development.

As in the previous two models the OLS results were purged of autocorrelation after the original results showed a DW value which was in the indeterminate range. However, unlike models 1 and 2, the purged OLS estimates were significantly different from the original OLS estimates. In particular the coefficient estimate for \( Y_d \) increased in value and the coefficient estimates for all
other variables declined in value.\textsuperscript{51} Worse still, the sum of the coefficients for $Y_d$ and $C_{-1}$ decreased from 0.94 to 0.83 and $C_{-1}$ was no longer significant. However, both $M_{ARP&D}$ and $M_{ARP&D-1}$ continue to be significant.

The 2SLS results in model 3 are worse than the corresponding 2SLS results of models 1 and 2 in that the DW statistic for both 2SLS results in model 3 are in the indeterminate range. However, equation 3b does perform better than equations 1b and 2b as far as the individual coefficient values for $Y_d$ and $C_{-1}$ are concerned.\textsuperscript{52} Equation 3c performs badly in general.

The overall conclusions which can be drawn from the results of models 1, 2 and 3 are the following. Both $M_a$ and $A$ provide better indices of marketing than $M_{ARP&D}$. The original OLS estimates are as good as those of models 1 and 2 but worsens when the estimator are purged of autocorrelation. The sign for the coefficient of $M$ continues to be positive in all cases and significant in three of the four equations of model 2. The sign for the coefficient of $M_{-1}$ continues to be negative in all cases and significant in three of the four equations of model 3. The offending equation in both case is 3c where investment is endogenous. The overall results worsen as we move from model 1 to model 2 to model 3.

\textsuperscript{51} Constant term excluded.

\textsuperscript{52} But note that the coefficient for $C_{-1}$ is not significant and the sum of the coefficients for $Y_d$ and $C_{-1}$ is smaller than what we would expect.
Model 4 is similar to model 3 in that it uses a principal components index of marketing. However, the original variables are advertising expenditures, consumer credit balances outstanding and total number of trademarks issued including renewals. Another difference is that the marketing equation is based on the uncertainty model. The equations corresponding to model 4 are 4, 4b and 4c.53

The overall performance of model 4 is about the same as that of model 3. Both show good OLS results except for the DW statistic. The $M_{ARRAD}$ index performs somewhat better than the $M_{ART}$ index for the simultaneous equation model with exogenous investment except that the DW statistic in model 4 is better.54 Model 4 performs better than model 3 for the simultaneous equation model with endogenous investment. From the point of view of significance of the marketing variables $M_{ART}$ performs better than $M_{ARRAD}$ as an index of marketing activity. This is seen from the fact that $M$ and $M_{-1}$ are significant in all three equations of model 4 while $M$ and $M_{-1}$ are significant in only two of the three equivalent

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53. There is no equation 4a since the single equation model was not re-estimated using the Wildreth-Iu procedure.

54. DW in equation 4b indicates absence of autocorrelation while DW in equation 3b is in the indeterminate range.
equations of model 3.\textsuperscript{55}

Models 5-9.

Models 5-9 are comparable to model 4 in that they all have the same marketing equation (that based on uncertainty) and use a principal components index. The difference lies in the use of a different set of original variables in obtaining the principal components.

The performance of model 5 is almost identical to that of model 4 indicating that $M_{AR}$ is equally good as an index of marketing as $M_{ART}$. As in model 4 both $M$ and $M_{-1}$ are significant in all three equations.

Fewer coefficients are significant in model 6 than in model 5. This suggests that total trademarks including renewals performs somewhat better as an index of marketing than only new issues of trademarks.

Models 7 and 8 show only the results of the single equation model and the simultaneous equation model with exogenous investment. The results of model 7 are almost identical to model 6 except that $C_{-1}$ is now significant in the single equation model. This indicates that new issues of trademarks provide a better index of marketing when combined with the net increase in consumer credit than with consumer credit balances outstanding.

\textsuperscript{55} From this point of view $M_{ART}$ is even preferred to $A$ as an index of marketing since $A_{-1}$ is not significant in equation 2c.
Model 8 performs relatively badly suggesting that patents issued does not provide as good an index of new products as trademarks or R&D expenditures.

Model 9.

Model 9 is an attempt to discover whether the significant relationship found between consumption and marketing can be attributed to spurious correlation. In chapter 3, part 1, it was noted that consumption should be measured net of marketing costs. However, because of data limitations, consumption expenditures were measured inclusive of marketing costs in the empirical tests. This should bias the results in favour of the hypothesis that marketing has a significant effect on consumption. In equation 9, therefore, the variables C and C-1 are measured net of marketing costs where M and, the independent variable, is used as an estimate of marketing costs included in consumption expenditures. The results clearly indicate that the relationship between C and M cannot be attributed to spurious correlation since the coefficient of M is highly significant. Equation 9 can be compared with equation 1a since the only difference between these two equations is that in equation 1a consumption is measured inclusive of marketing costs. In equation 9 both the size of the coefficient for M and its associated t-value falls compared with equation 1a. This indicates the presence of some spurious correlation in equation 1a. However, the results are unchanged in every other respect and M continues to have the correct sign and to be significant in equation 9.
Model 10.

Model 10 is an attempt to test whether marketing becomes more effective as population increases since each dollar of marketing expenditure will now reach more people. To test this hypothesis the variables \( M_0 \) and \( M_{t-1} \) are multiplied by the population aged 16 years and over. To see whether population increase has an effect on the significance of the marketing coefficient equation 10 should be compared with equation 1a. The t-value for \( M_0 \) increases from 6.1 in equation 1a to 6.6 in equation 10 suggesting a marginal improvement in the results when the increase in the population is taken into consideration.

Models 11-17.

Models 11-17 do not include all the variables suggested by our basic consumption function \( C_t = \alpha_0 + \alpha_1 Y_{dt} + \alpha_2 M_t + \alpha_3 M_{t-1} + \alpha_4 M_{t-1} \). The equations in these models were tested primarily for comparison with previous empirical tests of the consumption function which are relevant to the present study. The results of these equations are therefore considered in the next section.

4.3 COMPARISON OF EMPIRICAL RESULTS WITH SOME EXISTING EMPIRICAL TESTS OF THE RELATIONSHIP BETWEEN MARKETING AND AGGREGATE CONSUMPTION.

Comparisons Involving the Basic Equation

\[ C_t = \alpha_0 + \alpha_1 Y_{dt} + \alpha_2 M_t + \alpha_3 M_{t-1} + \alpha_4 M_{t-1} \]

An equation similar to the above was tested previously by
Yancey experimented with four time periods - 1930 through 1941, 1930 through 1941, 1922 through 1941, and 1922 through 1952 omitting the years 1942 through 1948 - and two types of advertising data as indices of marketing - aggregate advertising expenditures in 1948 dollars and lineage of magazine advertising in millions of lines per month. As in the present study Yancey used annual data, provided both single equation and simultaneous equation results, and in his simultaneous equation models experimented with both exogenous and endogenous investment.

The results obtained by Yancey provided the first empirical support for the hypothesis that marketing has a positive and significant effect on the level of aggregate consumption. The results obtained by Yancey were, however, generally poorer than those obtained in the present study. For example in only one of the thirteen equations tested by Yancey involving the complete model

\[ C = a_0 + a_1 X_1 + a_2 Y + a_3 X + a_4 M \]

was the coefficient for marketing positive and significant, compared with 23 out of 27 in the present study.

Several explanations can be put forward for the relatively poorer results obtained by Yancey. Yancey noted that his observa-

56. The only difference with Yancey's equation is that he used previous peak income instead of lagged consumption as one of his independent variables.

57. Yancey found that "either type of advertising data, whether deflated total advertising expenditures or magazine lineage, yield about the same information on the coefficients for advertising." (p.99).

58. In the present study the coefficient for marketing is positive in all cases. The coefficient for marketing was negative in 5 out of the 13 equations involving the complete model in Yancey's study.
TABLE 4.1

Estimates of Parameters for the Consumption Function.

<table>
<thead>
<tr>
<th>Model/Equation</th>
<th>Index of Marketing (1)</th>
<th>Method of Estimation</th>
<th>Constant</th>
<th>Coefficient of $Y_d$</th>
<th>Coefficient of $M$</th>
<th>Coefficient of $C-1$</th>
<th>Variance of $C-1$</th>
<th>Coefficient of $V_C1$</th>
<th>$\bar{y}$/DW</th>
<th>Sum of coefficient for $Y_d$ and $C-1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>CTS</td>
<td>0.98</td>
<td>0.56</td>
<td>2.77</td>
<td>0.30</td>
<td>0.013</td>
<td>-2.60</td>
<td>1.60</td>
<td>0.0095</td>
</tr>
<tr>
<td>1a.</td>
<td>(1)</td>
<td>CTS ($\mu - \bar{Y}_d$</td>
<td>1.65</td>
<td>0.50</td>
<td>2.77</td>
<td>0.34</td>
<td>0.010</td>
<td>-2.50</td>
<td>0.0090</td>
<td>0.0090</td>
</tr>
<tr>
<td>1b.</td>
<td>Mc</td>
<td>CTS ($\bar{Y}, \bar{M}_a$</td>
<td>-5.8</td>
<td>0.34</td>
<td>2.05</td>
<td>0.65</td>
<td>0.000</td>
<td>-3.98</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>1c.</td>
<td>Ms</td>
<td>CTS ($\bar{M}_a$</td>
<td>-7.3</td>
<td>0.45</td>
<td>2.91</td>
<td>0.51</td>
<td>0.153</td>
<td>-3.10</td>
<td>0.0005</td>
<td>0.0005</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>CTS</td>
<td>-3.3</td>
<td>0.40</td>
<td>8.1</td>
<td>0.47</td>
<td>0.011</td>
<td>-7.2</td>
<td>0.0005</td>
<td>0.0005</td>
</tr>
<tr>
<td>2a.</td>
<td>(1)</td>
<td>CTS ($\mu - \bar{Y}_d$</td>
<td>-0.71</td>
<td>0.57</td>
<td>7.4</td>
<td>0.36</td>
<td>0.006</td>
<td>-6.6</td>
<td>0.0090</td>
<td>0.0090</td>
</tr>
<tr>
<td>2b.</td>
<td>Ms</td>
<td>CTS ($\bar{Y}, \bar{M}_a$</td>
<td>-7.7</td>
<td>0.26</td>
<td>0.8</td>
<td>0.72</td>
<td>0.022</td>
<td>-8.8</td>
<td>0.0005</td>
<td>0.0005</td>
</tr>
<tr>
<td>2c.</td>
<td>Ms</td>
<td>CTS ($\bar{M}_a$</td>
<td>-7.0</td>
<td>0.30</td>
<td>9.7</td>
<td>0.67</td>
<td>0.399</td>
<td>-9.7</td>
<td>0.0005</td>
<td>0.0005</td>
</tr>
</tbody>
</table>

See notes at end of table.
### TABLE 4.1

Estimates of Parameters for the Consumption Function. (continued)

<table>
<thead>
<tr>
<th>Model/Equation</th>
<th>Index of Estimation</th>
<th>Method of Estimation</th>
<th>Constant</th>
<th>Coefficient of $Y_d$</th>
<th>Coefficient of $M$</th>
<th>Coefficient of $C_{-1}$</th>
<th>Variance of $C_{-1}$</th>
<th>Coefficient of $M_{-1}$</th>
<th>$F/DW$</th>
<th>Sum of coefficient for $Y_d$ and $M$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2d. A <em>contd.</em></td>
<td>2SLS (10, $W_y$)</td>
<td>-10.3</td>
<td>0.20</td>
<td>11.2</td>
<td>0.80</td>
<td>(.028)</td>
<td>-10.4</td>
<td>(5.0)</td>
<td>0.9022</td>
<td>2.32</td>
</tr>
<tr>
<td>2e.</td>
<td>2SLS (10)</td>
<td>0.27</td>
<td>0.63</td>
<td>6.8</td>
<td>0.29</td>
<td>(.354)</td>
<td>-5.2</td>
<td>(1.22)</td>
<td>0.9044</td>
<td>0.91</td>
</tr>
<tr>
<td>3.</td>
<td>OLS</td>
<td>8.1</td>
<td>0.54</td>
<td>21.0</td>
<td>0.40</td>
<td>(.012)</td>
<td>-30.4</td>
<td>(5.2)</td>
<td>0.9996</td>
<td>1.59*</td>
</tr>
<tr>
<td>3a. MARDN (67.70)</td>
<td>OLS (V-IW00)</td>
<td>35.2</td>
<td>0.72</td>
<td>11.0</td>
<td>0.11</td>
<td>(.010)</td>
<td>-6.1</td>
<td>(2.5)</td>
<td>0.9990</td>
<td>1.86</td>
</tr>
<tr>
<td>3b.</td>
<td>2SLS (10, $W_S$)</td>
<td>47.5</td>
<td>0.52</td>
<td>22.5</td>
<td>0.20</td>
<td>(.032)</td>
<td>-10.2</td>
<td>(4.0)</td>
<td>0.9990</td>
<td>1.50*</td>
</tr>
<tr>
<td>3c.</td>
<td>2SLS ($W_S$)</td>
<td>10.1</td>
<td>1.05</td>
<td>9.0</td>
<td>-0.25</td>
<td>(.173)</td>
<td>-3.0</td>
<td>(-1.8)</td>
<td>0.9987</td>
<td>1.54*</td>
</tr>
<tr>
<td>4. MARD (93.29)</td>
<td>OLS</td>
<td>10.1</td>
<td>0.64</td>
<td>0.2</td>
<td>0.25</td>
<td>(.017)</td>
<td>-2.7</td>
<td>(-2.5)</td>
<td>0.9990</td>
<td>1.01</td>
</tr>
</tbody>
</table>

See notes at end of table.
<table>
<thead>
<tr>
<th>Model/Equation</th>
<th>Index of Marketing (17)</th>
<th>Method of Estimation</th>
<th>Constant</th>
<th>Coefficient of $y_t$</th>
<th>Coefficient of $y_{t-1}$</th>
<th>Coefficient of $y_{t-2}$</th>
<th>Variance of $y_{t-1}$</th>
<th>$\delta/\mu_y$</th>
<th>Sum of coefficients for $y_t$ and $y_{t-1}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>4a. $M\alpha_d$ (01.72)</td>
<td>OLS (1.23)</td>
<td>$a_0 = 13.5$</td>
<td>0.67</td>
<td>0.2</td>
<td>0.22</td>
<td>(1.52)</td>
<td>(1.62)</td>
<td>(1.05)</td>
<td>0.0006</td>
</tr>
<tr>
<td>4b. $M\alpha_d$ (00.64)</td>
<td>OLS (1.52)</td>
<td>$a_0 = 20.5$</td>
<td>0.49</td>
<td>0.9</td>
<td>0.5</td>
<td>(1.52)</td>
<td>(2.07)</td>
<td>(1.62)</td>
<td>0.0006</td>
</tr>
<tr>
<td>4c. $M\alpha_d$ (01.72)</td>
<td>OLS (1.23)</td>
<td>$a_0 = 25.6$</td>
<td>0.8</td>
<td>0.9</td>
<td>0.8</td>
<td>(1.52)</td>
<td>(2.07)</td>
<td>(1.62)</td>
<td>0.0006</td>
</tr>
</tbody>
</table>

See notes at end of table.
### Table 4.1

Estimates of Parameters for the Consumption Function.  (continued)

<table>
<thead>
<tr>
<th>Model/Equation of Estimation</th>
<th>Index of Marketing (1)</th>
<th>Method</th>
<th>Constant</th>
<th>Coef. of $X_1$</th>
<th>Coef. of $Y$</th>
<th>Coef. of $C-1$</th>
<th>Coef. of $C-2$</th>
<th>Var. of $Y$</th>
<th>Coef. of $C-1$</th>
<th>R/CW</th>
<th>Sum of Coefficients for $X_1$, $X_2$, and $X_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td></td>
<td>OLS</td>
<td>16.0</td>
<td>(3.2)*</td>
<td>(4.1)*</td>
<td>(6.7)*</td>
<td>(5.5)*</td>
<td>(0.016)</td>
<td>(-0.4)</td>
<td>0.9992</td>
<td>0.72</td>
</tr>
<tr>
<td>7b.</td>
<td></td>
<td>2SLS</td>
<td>25.3</td>
<td>(5.0)*</td>
<td>(6.6)*</td>
<td>(13.2)*</td>
<td>(3.1)*</td>
<td>(0.056)</td>
<td>(-0.5)</td>
<td>0.9994</td>
<td>0.94</td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td>OLS</td>
<td>14.6</td>
<td>(1.20)</td>
<td>(4.7)*</td>
<td>(6.3)</td>
<td>(1.40)</td>
<td>(0.026)</td>
<td>(-0.4)</td>
<td>0.9987</td>
<td>0.90</td>
</tr>
<tr>
<td>8b.</td>
<td></td>
<td>2SLS</td>
<td>22.0</td>
<td>(1.36)</td>
<td>(-0.52)</td>
<td>(6.6)</td>
<td>(1.23)</td>
<td>(0.738)</td>
<td>(-0.6)</td>
<td>0.9890</td>
<td>0.85</td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td>OLS</td>
<td>1.65</td>
<td>(0.46)</td>
<td>(3.1)*</td>
<td>(7.1)*</td>
<td>(3.3)*</td>
<td>(0.011)</td>
<td>(-5.1)</td>
<td>0.9900</td>
<td>0.92</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td>OLS</td>
<td>10.5</td>
<td>(1.4)</td>
<td>(7.7)*</td>
<td>(6.6)*</td>
<td>(2.8)*</td>
<td>(0.011)</td>
<td>(-4.7)</td>
<td>0.9904</td>
<td>0.89</td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td>OLS</td>
<td>13.8</td>
<td>(3.9)*</td>
<td>(7.6)*</td>
<td>(3.6)*</td>
<td>(0.25)</td>
<td>(0.014)</td>
<td>--</td>
<td>0.9900</td>
<td>0.83</td>
</tr>
</tbody>
</table>

See notes at end of table.
### Table 4.1

Estimates of Parameters for the Consumption Function. (continued)

<table>
<thead>
<tr>
<th>Model/Equation</th>
<th>of Estimation</th>
<th>Method</th>
<th>Constant</th>
<th>Coeff. of ( Y_d )</th>
<th>Coeff. of ( M )</th>
<th>Coeff. of ( 2-1 )</th>
<th>Coeff. of ( 2 )</th>
<th>Variance</th>
<th>Coeff. of ( 2 )</th>
<th>( R/DW )</th>
<th>Sum of coeff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. MARRA</td>
<td>OLS</td>
<td>12.1</td>
<td>0.84</td>
<td>0.15</td>
<td>0.04</td>
<td>0.025</td>
<td>--</td>
<td>0.00088</td>
<td>0.00098</td>
<td>1.87</td>
<td>0.89</td>
</tr>
<tr>
<td>13. A</td>
<td>OLS</td>
<td>13.4</td>
<td>0.84</td>
<td>0.02</td>
<td>-0.01</td>
<td>0.012</td>
<td>--</td>
<td>0.00000</td>
<td>0.00000</td>
<td>1.83</td>
<td>0.00000</td>
</tr>
<tr>
<td>14.</td>
<td>OLS</td>
<td>13.2</td>
<td>0.86</td>
<td>0.02</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.00000</td>
<td>0.00000</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>14b.</td>
<td>2SLS (10,10)</td>
<td>7.0</td>
<td>0.70</td>
<td>2.6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.0086</td>
<td>0.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14c.</td>
<td>2SLS (10,10)</td>
<td>0.5</td>
<td>0.86</td>
<td>1.20</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.0989</td>
<td>1.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14d.</td>
<td>2SLS (10,10)</td>
<td>0.0</td>
<td>0.70</td>
<td>2.06</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.0987</td>
<td>0.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. M e</td>
<td>OLS</td>
<td>14.2</td>
<td>0.93</td>
<td>0.59</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.0001</td>
<td>1.63</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See notes at end of table.
<table>
<thead>
<tr>
<th>Model/Equation</th>
<th>Method</th>
<th>Index</th>
<th>Method of Estimation</th>
<th>Constant</th>
<th>Coefficient of Yd</th>
<th>Coefficient of M</th>
<th>Coefficient of C-1</th>
<th>Variance</th>
<th>Coefficient of M-1</th>
<th>( R^2/DW )</th>
<th>Sum of Coefficient for Yd and C-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. MARR&amp;D</td>
<td>OLS</td>
<td>30.1</td>
<td>(3.6)* (36.7)*</td>
<td>0.83</td>
<td>6.5</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.020</td>
<td>0.9201</td>
<td>1.60*</td>
</tr>
<tr>
<td>17. --</td>
<td>OLS</td>
<td>2.0</td>
<td>(2.6)* (7.0)*</td>
<td>0.82</td>
<td>0.08</td>
<td>(0.56)</td>
<td>0.0988</td>
<td>0.90</td>
<td>1.53*</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Notes: (1) Where a principal components index of marketing is used the subscripts following M indicates the original variables used in obtaining the principal components. For example, MARR&D indicates that the original variables are advertising expenditures, consumer credit balances outstanding and expenditures on industrial research and development. The number in parenthesis indicates the percentage of variation which is explained by the first principal component.

(2) H-IU0 indicates that the OLS results is purged of autocorrelation by using the Hildreth-Lu procedure. The 00 subscript indicates that we are using the modified Hildreth-Lu procedure (See Massager' 73, p.467-5). 0 indicates that investment is exogenous in the model. Where this is not indicated, investment is endogenous. M indicates that marketing is exogenous (equation 14f, only). MGA indicates that the marketing equation used is based on the stock adjustment theory. My indicates that the alternative marketing equation, i.e., that based on uncertainty is used.

(3) t-values are given in parenthesis.

(4) The * following the t-value indicates that the coefficient is significant at the .05 level.

(5) The first value is the coefficient of determination adjusted for degrees of freedom. The second value is the Durbin Watson statistic. The * following the DW statistic indicates that DW is in the indeterminate range.
tions prior to 1930 were likely to be affected significantly by errors of observation (pp.86-87) and in his conclusion he emphasized the need for better data to test the basic hypothesis again (p.113). However, it is possible that marketing had less of an effect on aggregate consumption in the pre-World War II period.

With regards to the coefficient for lagged marketing, this was found to be negative and significant in only one of the thirteen equations tested by Yancey 59 compared with 20 out of 27 in the present study. However, Yancey's general conclusion that "the coefficient for lagged advertising was predominantly negative" (p.100) is in agreement with the results obtained in the present study.

Another point of general agreement between Yancey's results and those of the present study is that the OLS and 2SLS results are similar. Yancey's conclusion with regards to this was that "the least-squares method of estimation appears to give estimates that are about the same as the average of the estimates by systems approach where several plausible specifications were given for different systems." (p.112).

Comparisons Involving the Basic Equation
\[ C_t = a_0 + a_1 Y_{dt} + a_2 M_t + a_3 C_{t-1}. \]

An equation similar to the above was tested previously by

59. This is the same equation in which the marketing variable was positive and significant in Yancey's study.

60. In the present study the coefficient for lagged marketing is negative in all cases. The coefficient for lagged marketing was positive in 7 out of the 13 equations in Yancey's study. In none of these cases were it significant.
both Yancey, op.cit., and Taylor and Weiserbs, op.cit.\(^6\) Taylor and Weiserbs used per capita advertising expenditures in 1958 dollars as their index of marketing.\(^6\)

Taylor & Weiserbs found that their results were "very favourable to the view that advertising has a positive impact on consumption" (pp.650-651). Their results showed that a one dollar per capita increase in advertising expenditures lead to an increase in per capita consumption of about $4.55 in the short run and $7.85 in the long run (p.651). These values are much higher than those obtained in the present study and in Yancey's study. For example, equation 13 in table 4.1 shows that when lagged advertising is omitted from the model the coefficient for advertising is 0.93. The comparable OLS results obtained by Yancey for the coefficient of advertising were .452 for the period 1922-53 (excluding 1942-48) and 1.467 for the period 1922-41. Neither of Yancey's results were significant. The coefficient obtained in the present study is closer to that of Yancey and is significant.\(^6\)

\(^6\) Taylor and Weiserbs used a "state variable" to capture the effect of stock adjustment and habit formation on aggregate consumption, instead of lagged consumption, in their equation.

\(^6\) Although Taylor and Weiserbs found that aggregate advertising expenditures in 1958 dollars gave marginally better results than per capita expenditures (p.650) they did not experiment with it in the present equation.

\(^6\) We are only comparing OLS results since Taylor and Weiserbs used only single equation models. Note that the coefficient for A increases substantially in equations 14b and 14f. These results agree with the \(a\) priori expectation that the OLS estimate of \(Y_d\) would have an upward bias and the other coefficients a downward bias. There is no counteracting distributed lag bias in this equation. However, the 2SLS results are less reliable because the DW value indicates positive autocorrelation.
It is not known whether the coefficient for advertising obtained by Taylor and Weiserbs was significant since the program used by Taylor and Weiserbs and the non-linear estimation procedure did not permit the computation of standard errors.\textsuperscript{64} However, Taylor and Weiserbs were somewhat dissatisfied with the results obtained in their estimating equation from which the structural coefficient estimates were obtained.\textsuperscript{65} Their comments were:

Despite these positive features, however, the overall quality of this model leaves much to be desired. The coefficients of $x_{t-1}[Y_{dt-1}]$ and $a_{t-1}[A_{t-1}]$ are both insignificant, and this is true also of the constant, which means, as a consequence, that it cannot be assumed that $\delta$, the depreciation rate in the structural model, is different from zero, (p.648).\textsuperscript{66}

The results obtained in the present study indicates that the relatively large coefficient estimate for $A$ obtained by Taylor and Weiserbs must be attributed to the method of estimation which they use.

\textsuperscript{64} Taylor and Weiserbs, op.cit., p.648, n.17 and p.649.

\textsuperscript{65} This led them to re-estimate their results using savings as their dependent variable. This improved their results. However, it is not possible to make any detailed comparisons between their results from the savings model and the results in the present study. All that can be said is that the results obtained in their study is confirmed in the present study. In the model with savings as their dependent variable they find that the coefficient for advertising in their structural equation was negative and significant. This is in agreement with our results that the coefficient for advertising is positive and significant when consumption is the dependent variable.

\textsuperscript{66} The basic estimating equation used by Taylor and Weiserbs is of the form $C_t = a_0 + a_1C_{t-1} + a_2 \Delta Y_{dt} + a_3 \Delta Y_{dt-1} + a_4 \Delta A_t + a_5 A_{t-1}$. The basic structural equation is of the form $C_t = \lambda_0 + \lambda_1 S_t + \lambda_2 \Delta Y_{dt} + \lambda_3 A_t$ where $S_t$ is the state variable referred to earlier.
In particular, Taylor and Weiser observed a positive value for the coefficient estimate of lagged advertising in their estimating equation\(^{67}\) which would boost their estimate of the coefficient for \(A\) in their structural equation. In the present study the coefficient for lagged advertising is invariably negative suggesting that when lagged advertising is omitted from the model, the coefficient for \(A\) should fall in value, not increase.\(^{68}\)

Two other equations were tested in the present study using the basic model without lagged marketing. These are equations 11 and 12. Comparing equations 11, 12 and 13, the indices \(M_e\) and \(A\) are significant but \(M_{ARR&D}\) is not. The equation with advertising as the index of marketing is preferred to the equation with marketing expenditures since the DW value in equation 13 indicates an absence of autocorrelation whereas the DW value in equation 11 is in the indeterminate range. All three equations show lagged con-

\(^{67}\) Note that this coefficient was not significant.

\(^{68}\) Equation 2a. in table 4.1 shows that when lagged advertising is included in the model the coefficient estimate for \(A\) is 7.4 compared with 0.93 when lagged advertising is omitted. Comparing equations 11 and 12 with equations 1a. and 3a. respectively, shows the same pattern. The coefficient estimate for \(M_e\) falls from 2.77 to 0.57 when \(M_e-1\) is omitted from the model. The coefficient estimate for \(M_{ARR&D}\) falls from 14.2 to 0.15 when \(M_{ARR&D-1}\) is omitted from the model. All of these estimates are significant except for the estimate 0.15.
Yancey, *op.cit.*, tested nine equations in which he excluded both his variable for previous peak income and his variable for lagged advertising. His time periods were 1930-41 and 1929-41. The comparable equations in the present study are equations 14, 14b, 14c, 14f, 15 and 16.

Of the nine equations tested by Yancey three equations gave negative values for the advertising coefficient. In the present study the coefficient for marketing is positive in all six equations. The marketing coefficient is also significant in all six cases. Yancey estimated standard errors for only two of his comparable nine equations. In both cases the coefficient for advertising

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69. This can only be explained in terms of the high correlation between $Y_t$ and $C_{-1}$. Note the relatively high values obtained for the coefficient of $Y_t$. Whenever this is the case - see equations 3a, 3c, 4c and 17 - the coefficient for $C_{-1}$ is relatively small and insignificant. Alternatively, if the coefficient for $C_{-1}$ is relatively high - see equations 2d, 4b, 6b and 7b - the coefficient for $Y_t$ is relatively small and insignificant. The fact that the coefficient for $C_{-1}$ is insignificant even when marketing is excluded from the model - equation 17 - tends to indicate that although the marketing variables are correlated with $Y_t$ and $C_{-1}$, marketing is not simply "freeloading" on income and lagged consumption - see Taylor and Weisgerbs, *op.cit.*, p.648. The same conclusion can be drawn if equations 11 and 13 are compared with equations 15 and 14 respectively. The coefficient estimates and t-values for $M_e$ and $A$ are almost identical whether $C_{-1}$ is included or excluded from the model.
Comparison of equations 14, 15 and 16 show all three indices of marketing – \( A, M_e \) and \( M_{ARRAD} \) – to be equally significant. However, as in equation 13, the advertising index performs better in terms of the DW statistic. Comparing the equations of model 14, again the only difference is in terms of the DW statistic. Only the OLS results indicate an absence of autocorrelation. In going from equation 14b where investment is exogenous to equation 14c where investment is endogenous the t-value for \( M \) falls noticeably although \( M \) continues to be significant in 14c. This deterioration in the significance of coefficients in going from exogenous investment to endogenous investment was noted earlier with regards to models 1, 2 and 3. Equation 14c, however, does show a better DW statistic than equation 14b.

Equation 14f is interesting for the following reasons. It is the only equation estimated by 2SLS in which marketing is autonomous. Estimation by 2SLS takes care of the simultaneity bias in the coefficient estimate of \( Y_d \) arising from the fact that \( Y_d \)

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70. These two equations were estimated by OLS for the two time periods. His coefficient estimates for \( Y_d \) were 0.75 for both time periods. His coefficient estimates for \( A \) were 0.032 (1930-41) and 0.16 (1929-41). The comparable estimates in the present study are 0.86 for \( Y_d \) and 0.22 for \( A \) – see equation 14. All coefficients in equation 14 are significant, \( R^2 \) is high and DW indicates an absence of autocorrelation.
is an endogenous variable. However, if marketing is endogenous the coefficient estimate of $Y_d$ would still be biased because of our assumption of autonomous marketing, i.e., the coefficient estimate of $K$ would have an upward bias and the coefficient estimate of $Y_d$ would have a downward bias. Compare the results of equation 14f with those of 14b where marketing is endogenous. The coefficient estimates, $t$-values, $R^2$ and DW statistic are almost identical. These results clearly indicate an absence of simultaneity bias arising from the assumption that marketing is autonomous.

The models used by Taylor and Weiserbs, op.cit., were single equation models. However, for one of their equations, they tested for possible simultaneity bias due to their assumption that advertising was autonomous. Their conclusion can be compared with the one reached above.

In comparing this equation with (y.1) in Table 1, we see that the standard error of the estimate is about $3$ higher than in (y.1), and that the coefficient (in absolute value) of advertising has been reduced by about one-third and is now only about twice its estimated asymptotic standard error. However, in view of the fact that standard errors for TSUS for finite samples do not always exist, we should not attach much importance, one way or another, to this apparent drop in significance. In terms of the steady-growth saving-income ratios, formulas (37) and (38) now yield values of .085 and .068, respectively.

In view of these results, simultaneity between consumption (or, more particularly, final sales) and adver-
timing is something that quite clearly cannot be ruled out. However, despite the fact that the quantitative impact of advertising has decreased, it has hardly disappeared altogether. A 1.7 percentage point difference (difference in the single equation model was 2.3 percentage point) in the golden-age saving rate is still not something to be dismissed out of hand (p.653).

The conclusion reached by Taylor and Weiserbs is favourable to the view that advertising has an effect on aggregate consumption even after taking account of simultaneity in the relationship. However, their conclusion is less strong than the one indicated by the results obtained in the present study. It is therefore necessary to note the differences in the two tests which might explain the different emphasis of the two conclusions.

The difference lies primarily in the different models used. Taylor and Weiserbs do not use a complete simultaneous equation model but simply specify an equation for advertising. This means that $Y_d$ is still treated as an exogenous variable. Even though the dependent variable is savings rather than consumption there is still some bias due to simultaneity in the relationship between savings and disposable income. Secondly, in their estimating equation lagged savings is one of the independent variables so that there is also a distributed-lag bias. Because of these other

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72. This equation is only marginally different from the marketing equation used in our test. The Taylor and Weiserbs equation is $A_t = d_0 + d_1 \Delta C_t + d_2 C_{t-1} + d_3 A_{t-1}$. The equation used in the present study is $A_t = d_0 + d_1 C_t + d_2 A_{t-1}$. 


two sources of bias it might not be possible to disentangle clearly the bias due to simultaneity between advertising and consumption in the study by Taylor and Weiserbs.

The use of a two equation model by Taylor and Weiserbs to test for simultaneity between advertising and consumption also involves a problem of identifying the predetermined variables in the first stage of 2SLS which Taylor and Weiserbs were forced to ignore. The two equations were:

\[ S_t = a_1 S_{t-1} + a_2 \Delta Y_{dt} + a_3 \Delta A_t \]
\[ A_t = b_0 + b_1 A_{t-1} + b_2 \Delta C_t + b_3 C_{t-1} \]

As stated the model suggests that \( \Delta Y_{dt} \) and \( \Delta C_t \) are exogenous. Therefore, the equation for \( A_t \) in the first stage should be

\[ A_t = d_0 + d_1 A_{t-1} + d_2 C_{t-1} + d_3 S_{t-1} + d_4 \Delta Y_{dt} + d_5 \Delta C_t \]

However, the variables which Taylor and Weiserbs used in computing \( A_t \) were \( A_{t-1}, C_{t-1} \) and \( Y_{dt-1} \) (p.652) implicitly assuming \( \Delta Y_{dt} \) and \( \Delta C_t \) to be endogenous and arbitrarily substituting \( Y_{dt-1} \) for \( S_{t-1} \), \( S \) being the level of savings and \( Y_d \) the level of disposable income.
CHAPTER V

MARKETING IN A LABOUR SUPPLY MODEL.

This chapter develops a dynamic model of the supply of labour which emphasizes shifts in the classical short-run labour supply curve as opposed to movements along the curve in response to changes in the real wage rate. It is hypothesized that marketing activity shifts up the labour supply curve over time in such a way as to increase the demand for work or income - reduce the demand for leisure. Reductions in the demand for leisure caused by shifts in the short-run curve tend to cancel out increases in the quantity of leisure demanded due to increases in the real wage rate¹ implicit in the backward bending shape of the short-run supply curve. The hypothesis that marketing shifts up the short-run supply curve provides an explanation for the empirical observation that average hours of work have not declined in the post-World War II period contrary to the predictions of the backward bending supply curve hypothesis, and the historical trend of average hours prior to World War II. It also provides an explanation for the observed increase in female participation rates - especially participation rates of married women - in the post-World War II period. The labour supply curve which is developed in this chapter is tested with empirical data and the results presented in section 5.7 below.

5.1 CONCEPTS OF LABOUR SUPPLY.

In economic theory the labour supply schedule is like any

1. See figure 3.2, p.167.
other supply curve, relating the quantity supplied to price. In the case of the labour supply curve, the schedule relates the quantity of non-hours (of standard efficiency) to the real wage rate. While most textbooks depict the labour supply curve as upward sloping, the slope of this curve cannot be determined a priori. The shape of the individual's labour supply curve is determined by his preferences for income and leisure. However, other factors must be considered in determining the household's labour supply curve. Further complications arise when we consider the economy's aggregate or total labour supply.

The Labour Supply Curve of the Individual.

The factors which determine the hours of labour which an individual supplies are numerous and varied. They include current remuneration, prospects for promotion and increased remuneration in the future, attitude towards work, working conditions, physical strength and mental ability, non-labour income and assets of the individual or his family, sex, age, tax rates and social security programs, and a host of other economic, demographic, and social factors.

Despite the large number of factors which enter the labour supply decision of the individual, economists have analysed this decision in terms of a strict leisure/income trade-off. The classical economists were of the opinion that the supply of labour by the individual would fall as his real wage increased, because higher wages would enable him to satisfy his needs with
less effort. Knight supported the view of the classical economists that an increase in wages would lead to a decrease in the quantity of labour supplied.\(^2\)

Lionel Robbins broke with the classical tradition when he suggested that the labour supply behaviour of each individual is determined by his "elasticity of demand for income in terms of effort." Since this elasticity would vary among individuals for a given wage rate, and for a given individual at different wage rates, the shape of the individual supply curve cannot be determined a priori.

After Robbins, the most popular notion about the individual’s supply curve which developed was that of the "backward bending supply curve." This is the idea that at some wage rate the income effect will dominate over the substitution effect causing the individual’s supply curve to become negatively inclined after that point.

The individual’s labour supply curve in the form described by the economist is not suitable for empirical testing.\(^5\) Its shape,

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therefore, has been determined largely from introspection. The following passage is an excellent example of the way in which economists attempt to deduce the possible shape of the individual's labour supply curve:

We can now get an idea of the probable shape of the individual labour supply schedule. There will be a certain minimum wage below which a person will not work at all. When this minimum wage is paid he will offer a certain amount of labour which will probably be maintained or even increased as the wage-rate goes up. But a point will soon be reached when a further rise in wages will lead to a reduction in the amount of work he is willing to do. The preference for leisure at the higher level of income will become stronger than the inducement to extra efforts at the higher wage-rate. But this tendency for the labour supply to fall off as wages rise may again be suddenly reversed over a certain range when the wage-rate reaches a level which enables the worker to move, by increased efforts, from one standard to a markedly higher one; for instance, moving to a more expensive district or buying a motor car. Beyond this level, further rises in wages will probably again lead to a reduction in labour supply.6

However, as Long (op.cit., p.39) points out, "observers alert for empirical evidence on the behaviour of the labour supply in response to changes in wages and income have not been lacking."

Thus as early as the decade after the Napoleonic Wars, West7 pointed out that "witnesses before Committees of both Houses, claimed that workers attempted to maintain their standard of living by working


longer hours even at lower wage rates. R.W.D. Wiles, who strongly supports the view that the backward bending supply curve of labour is universal to all societies recently gathered quantitative evidence and the testimony of tourists to support his conclusion that the "will to work" of the British has declined as compared with earlier periods and with other nations.

The Labour Supply Curve of the Household.

In analysing the supply of labour many economists agree that the relevant decision making unit is the family rather than the individual. All the factors which influence the behaviour of the individual's supply curve will also influence the household's decision to supply labour. However, by recognising the family as the decision making unit, another dimension is added to the labour supply concept. The individual can vary his supply of labour by varying the number of hours of work, by varying the intensity of work, and by varying the efficiency of each hour's work. In addition, the family can vary its supply of labour by varying the number of members of the family participating in the labour force. This extra dimension which the family adds to the

labour supply concept is extremely important in view of the increasing role being played by women in the labour force.

By recognizing the family as the decision making unit, the total hours of labour supplied by each decision making unit becomes extremely flexible. The increasing number of part-time jobs being made available to women adds to this flexibility. The old complaint that labour must choose between a fixed number of hours per-week or unemployment is no longer valid.11

The Aggregate Labour Supply Curve.

The individual or household labour supply is defined as the quantity of labour supplied for each wage rate at a given point in time. The aggregate labour supply is the lateral summation of these individual or household labour supply schedules.

11. Friedman has suggested that the whole argument that workers much choose a fixed number of hours is entirely specious. "In the first place, we have seen that much of the adjustment may take the form of the fraction of the people in the labour force. In the second place, even at any given time, a particular individual has some leeway. He can work overtime or not, take off more or less time during the year, choose the kind of occupation or employer that offers the number of hours of work he wants, etc. But neither of these is the basic fallacy. The important point is that the individual is like the perfect competitor: to each individual separately, the number of hours of work per week may be fixed, yet the level at which it is fixed is the result of the choices of the individuals as a group. If at any moment this level of hours is, say, larger than on the average people prefer at the given wage rate, this means that any employer who makes them shorter, who adjusts them to the workers' preferences, will make employment with him more attractive than employment with others." Milton Friedman, Price Theory: A Provisional Text (Chicago: Aldine, 1962), p.205.
With regard to the hypothesis of the backward bending supply curve of labour a further complication arises when we consider the aggregate labour supply. Even if individual or household supply curves are backward bending, it does not follow that the aggregate labour supply will have the same shape. First of all, as the wage rate is increased, workers with relatively high reservation wage rates will enter the labour force offsetting any decline in hours from those schedules which have started to bend backwards. Secondly, the point at which individual or household labour supply schedules begin to bend back varies. What happens to the aggregate curve therefore depends on the number of curves becoming negative, relative to the number of curves which are still positive. Finally, the elasticity of individual or household supply curves vary. If the number of negative segments are fairly inelastic, while the positive segments are fairly elastic, other things equal, the aggregate supply curve will still be positively sloped.


Any attempt to measure statistically the aggregate labour supply curve must first adapt the theoretical concept to a more operationally feasible construct. The empirical concept which most closely approximates the economists notion of the labour supply, is the labour-force.12 The behaviour of the labour-force can be observed either from the point of view of the number of persons in

12. See Ostry and Zaidi, op.cit., p.6
the labour-force - participation rates - or from the point of view of the average number of hours worked by those who make up the labour-force. Empirical studies of the labour-force have usually concentrated on these two aspects of labour-force behaviour.

The first systematic attempt to measure the labour supply was done by Douglas, op.cit. Douglas noted that theories about the shape of the labour supply curve were mere speculation and that "it is highly desirable to determine inductively what has been the precise influence which changes in wages have exercised upon the quantity of labor offered." (p.272). Douglas therefore set himself the task of tracing the relationship between changes in wages and "(1) changes in the proportion of the working population which habitually offers itself for employment and (2) changes in the standard hours of work per week." (p.272).

Taking each of 33 large American cities as a separate observation, Douglas found a negative association between the earnings of factory workers and the proportions of population in the labour force in January 1920. 13

Turning to the relationship between earnings and hours of work, Douglas used both cross-section and time-series analysis. Taking observations for several industries at a point in time, he found a negative correlation between average money earnings per hour in the various industries and the length of the standard working week. (p.302). His time series analysis also used data

for selected industries rather than the economy as a whole. And when his time series data was adjusted to take account for a possible trend factor in attitudes towards work and leisure, the coefficient of correlation between earnings and average hours was as low as -.07 (p.312).

Combining the effect on participation rates and average hours, Douglas reached the tentative conclusion that an increase of one per cent in hourly wages would cause a decrease of from one-fourth to one-third of one per cent in the quantity of labour offered (p.313).

The next significant empirical study of the labour supply was done by Long, op.cit. Long's objective was to update the work of Douglas, fill in the gaps left by Douglas' study, and utilize data from several foreign countries in addition to the United States.\textsuperscript{14}

The results obtained by Long tended to support Douglas' finding that variations in the proportion of a city's population in the labour force vary inversely with variations in its average income per equivalent adult-male worker. However, the inverse associations were not found in all cases. In particular, the inverse association was not supported by the 1950 census data (pp.5-6).

In a review article, Cohen comments on Long's findings:

\textsuperscript{14} The Douglas/Schoenberg study utilized the data provided by the 1920 and 1930 censuses. Long used the data provided by the 1900, 1940, and 1950 censuses.
There is much in the data, however, that raises questions about the overall significance of these findings. Thus, in 1950, there was virtually no association between labor force and earnings, and before 1950, the correlations among the various age-sex groups vary widely in significance. Through 1950, they were not highly significant for males 18-24 and 45-64, and not significant at all for males aged 25-44. In no year was the income-labour-force association very significant for females aged 18-24. The facts, together with the inadequacies and probably inaccuracies in both earnings and labour-force data, support a conclusion that the shape of the instantaneous labor-supply curve remains very much conjectural.16

5.2 THE RELATIONSHIP BETWEEN THE SUPPLY OF LABOUR AND THE DEMAND FOR INCOME.

Economists have always recognized implicitly a functional relation between the individual or household's supply of labour and its demand for income. Thus the English Mercantilists of the seventeenth and eighteenth centuries who postulated that the labour supply curve was negatively sloped with elasticity equal to unity,16 were implicitly assuming that the household's demand for income was perfectly inelastic.

The Utility theorists, in analysing the short-run labour supply curve, also made assumptions about the demand for income. They postulated that the demand for income was subject to diminishing marginal utility. Hence, an increase in the wage rate need not lead to an increase in hours worked.17


17. Ibid., p. 271.
An explicit formulation of the labour supply curve in terms of the demand for income was done by Robbins, op.cit. According to Rothschild, this task was undertaken by Robbins because the theory suggested that the individual labour supply schedule may either rise or fall in response to an increase in wage-rates. "Such 'irregular' supply conditions are usually not to the liking of the economist, who prefers his 'normal' demand and supply schedules which fall or rise over the whole range of price changes." 18

According to Robbins' analysis an increase in the wage rate means that the price of income in terms of effort has fallen. The individual will therefore increase the quantity of income which he buys, in accordance with the general 'Law of Demand'. However, it does not follow that the individual increases his supply of labour. Whether he does is determined by the elasticity of his demand for income. Only if his demand for income is elastic will he increase the amount of effort spent, i.e., increase his supply of labour.

The Demand for Income Over Time.

The short-run labour supply curve, whether it is analysed as a supply curve or as a demand for income curve, is an instantaneous picture of the relationship between the demand for income and the supply of effort. No time is allowed for the household either to adjust its attitude towards work, or its desire for in-

come. Yet any attempt to estimate this supply curve using time-series data introduces time for such adjustments. How the household adjusts its attitude towards work over time is not the subject of investigation in this thesis. However, one of the objectives of this thesis is the investigation of the demand for income over time. Specifically, this chapter attempts to investigate how the aggregate labour supply curve shifts over time as marketing activity introduces new goods into the society, and attempts to induce the desire for higher standards of living in the community.

The Existing Consensus on the Aggregate Short-Run Labour Supply Curve.

"A number of economists today view the aggregate short-run labour supply curve as having the same shape as the individual labour supply curve, i.e., backward-bending." 19

"Perhaps the most widely accepted hypothesis about the short-run supply curve of labor is that it is backward bending above some wage rate..." 20

"...it is equally common when considering the supply of labor to emphasize a function that is reentrant at some point, becoming unequivocally negative." 21

Although most economists assume that the short-run labour supply curve is backward bending, they seem to be in general agreement that the point at which the aggregate supply curve begins to bend back is determined by the level of development of the economy. Thus Friedman (op.cit., p.204) notes that, "... much depends on the relative value attached to goods purchased with money through the market relative to goods that can be acquired through non-market activity. In a primitive society, the initial low wage rate at which the income effect becomes dominant reflects a lack of familiarity with market goods and a limited range of tastes. As tastes develop and knowledge spreads, the point at which the income effect dominates tends to rise."

A similar view is expressed by Simon Rottenberg. "The point at which an individual begins to be insensitive to income incentives will be partly affected by the cultural influences that play upon his character. A man who has been brought up in a community which places a high value on work, which is 'consumption conscious' and which attaches prestige to the possession of material goods will not begin to offer less labor until there is a large increase in the price for his services or until the price is very high. On the other hand, a man who lives in a society which values leisure and which attaches no social stigma to living at a close-to-subsistence level will begin to offer less labor when small increases occur and when the price is very low.

These conditions of quick backward turning are said to be particularly characteristic of the people of the underdeveloped
... the more ignorant and phlegmatic of race" and positively sloped for those "... whose mental horizon are wider, and who have more firmness and elasticity of character." 22

Behaviour of the Short-Run Supply Curve of Labour Over Time.

The existing consensus on the short-run aggregate labour supply curve is that it is backward bending but that it shifts through time as an economy develops and the individuals who supply labour aspire to higher income levels. Consider two economies, A and B, at different stages of development. Suppose that A is less developed than B. Then the existing literature on the short-run supply curve suggests that, other things equal, the aggregate labour supply curves of the two economies can be represented diagrammatically as in figure 5.1.

Labour supply is measured along the horizontal axis and the real wage on the vertical axis. W_A is the subsistence wage for economy A. Below this wage rate no labour is supplied in economy A. As the wage rate is increased labour supply is increased until most workers achieve "the income of their heart's desire". 24


After this point, $W_A$ in figure 5.1, workers will supply less labour if the real wage is increased.

Economy B has the same population size and demographic characteristics as economy A. However, it is at a higher stage of economic development. Workers in this economy have become accustomed to a higher subsistence wage, $W_p$. Economy B's aggregate labour supply is also backward bending, but the wage rate at which workers achieve "the income of their heart's desire" is much higher, $W_{B1}$ in figure 5.1.
Traditionally, economic system A and B have been analysed as two distinct economic systems having different social mores and attitudes towards work. This is understandable in view of the economist's notion of the short-run labour supply curve as an instantaneous picture of labour behaviour. However, such analysis is misleading when we investigate the reaction of the labour force to increases in real wage rates which occur over time.

The aspiration for income varies not only between countries but within the same country over time. As Rottenberg (op.cit., p.96) notes, "The point at which the curve takes its negative slope is not the same for all persons; it must be somehow related to the aspirations which the worker has for income and to the intensity of his desire for leisure... The aspiration for income, however, need not be constant over time for the same person."

As an economy progresses, the quality of life which workers aspire to increases. Often new needs are created by the process of production and economic development. From this point of view economics A and B can be regarded as the same economy at different points in time, economy B being a later point in time. Figure 5.2 illustrates hypothetical aggregate supply curves of labour for the United States economy for the years 1950 and 1970. It is assumed that in both periods the wage rate is somewhat above subsistence level. Hence, the early segments of the curves are not shown. It is also assumed that the demographic characteristics of the population remain constant during this time period.

In 1950, the wage rate at which the aggregate supply curve begins to bend back is \( W_1 \).
An increase in the wage rate above $W_1$ will lead to a decrease in the supply of labour. However, by 1970, because of higher income aspirations by workers, the instantaneous labour supply curve has shifted up and to the right. The wage rate at which the curve begins to bend back is now higher, $W_2$ in figure 5.2.

Suppose that in 1950 the market wage rate is such that workers are on the negative portion of the aggregate labour supply curve, e.g., $W_1^*$ in figure 5.2. Since real wages are increasing over
time, the wage rate in 1970 would be higher. However, it does not follow that the supply of labour would be less in 1970 at this higher real wage. The reason is that the instantaneous labour supply curve of 1950 is no longer relevant in 1970. Whether the labour supply is greater or less in 1970 will depend on the extent to which real wages have risen and the rate at which workers increase their demand for higher incomes. If the rate at which workers increase their demand for higher income levels is such that the new instantaneous labour supply curve is the 1970 curve in figure 5.2, then the real wage rate must rise above $w_2$ for there to be a decrease in the supply of labour.

Continuous Shifts in the Short-Run Labour Supply Curve and Estimation Problems.

If the short-run labour supply curve is shifting over time, any attempt to measure this curve by simply observing wage rates and labour supply over time will fail in its objective. This is illustrated in figure 5.3. Suppose that annual observations are taken on ruling wage rates and quantities of labour supplied. The points will trace out a curve such as II, which is not the short-run labour supply curve as defined. It is rather a curve of labour force behaviour responding both to changes in wage rates and aspirations for higher income levels. The curve II will bend back over time if wage rates increase relatively fast or if aspirations for higher income levels increase relatively slow.
5.3 CHANGING INCOME ASPIRATIONS AND THE BEHAVIOUR OF THE LABOUR FORCE IN THE UNITED STATES IN THE POST-WORLD WAR II PERIOD.

The theory of the backward bending supply curve of labour suggests that as real wage rates increase, the supply of labour from a given population would decline. While this has been the
pattern observed in all industrial societies and has thereby provided one of the empirical justifications for the theory, two factors in the post-war experience of the United States seem to cast doubts on the validity of the theory. One factor which has been dealt with to some extent in the literature is the increasing participation rate of female workers. Little or no explanation has been provided so far in the literature for the other factor, i.e., the reluctance of full-time workers to reduce their average hours below the standard forty-hour week.

In reviewing the historical behaviour of the U.S. labour force so that the pattern of the post-war period can be contrasted with the earlier period, it is convenient to consider separately the trend in male participation rates, the trend in female participation rates, and the trend in average weekly or annual hours.

The Trend in Male Participation Rates.

The total male participation rate in the United States has shown a steady decline during the present century. Most of this decline is attributable to the decline in the participation rates of the age groups 16-24 and 65 and over. The participation rate of 'prime-age' males, i.e., those in the age group 25-64, has been relatively stable.

The decline in the participation rate of those in the age group 16-24 has been attributed to the increasing demand for higher education. The decline in the participation rate of those in the age group 65 and over has been attributed to compulsory retirement schemes and the relative decline of self-employment.
The following set of figures taken from Bowen and Finnegan corroboration the above description of the trend in male participation rates as far as the pre-World War II period is concerned. The total participation rate of males aged 14 years and over declined from 87.3 per cent in 1900 to 79.0 per cent in 1940. The rates of the age groups 14-19 and 20-24 declined from 61.1 per cent to 34.4 per cent and from 91.7 per cent to 82.0 per cent, respectively, during the same time period. The 65 and over age group declined from 68.3 per cent in 1900 to 41.5 per cent in 1940. The prime-age group (25-64) was 95.2 per cent in 1900. It fell to 92.7 per cent by 1940.

Several changes have occurred in labour force statistics which makes it difficult to compare the pre-World War II figures with the post-World War II figures. However, the post-World War II figures by themselves, suggest a similar pattern in the trend of male participation rates. The total participation rate of males aged 16 years and over declined from 96.8 per cent in 1947 to 79.7 per cent in 1972. And again the decline in the total rate is accounted for by the decline in the rates of the very young and

25. Economics of Labor Force Participation, op.cit., Table 1-6, p.561.

26. For a discussion of some of these changes see "A Note on Historic Comparability of Labor Force Statistics," in Manpower Report of the President 1972, op.cit., pp.119-120. One of the more important changes was increasing the lower age limit from 14 to 16 years, starting 1967, for defining persons in the labour force.

27. Ibid., Table A-2, p.128.
the very old. The rates for the age groups 16-17 years and 18-19 years declined from 52.2 per cent to 49.3 per cent and from 80.5 per cent to 72.0 per cent respectively, during the same time period.\footnote{28} The rate for the age group 65 years and over declined at an even faster rate in the post-war than in the pre-war period. In 1947 the rate for this group was 47.8 per cent. By 1972 it had reached 24.4 per cent.\footnote{29} The rates for the middle age groups were relatively stable over this period.

The trend in Female Participation Rates.

The historical trend of the total male participation rate can be explained either by the theory of the backward bending supply curve of labour or by other observable phenomena such as the increased numbers of young people at school and earlier retirement by the old. However, the historical trend of female participation rates runs counter to both of these explanations. Female participation rates have increased despite rising incomes, despite increasing education for young females, and despite compulsory retirement schemes for old females. A number of theoretical models have been developed to explain the apparent contradictory behaviour of the female labour supply curve. Some of these models will be discussed below in an attempt to relate these new models to the basic hypothesis of this thesis that increases in the household's labour supply over time can be explained by continuous shifts in the household's demand for income brought

\footnote{28. Ibid.}
\footnote{29. Ibid.}
about by increases in marketing activity.

The increase in the total female participation rate in the present century is due to the increase in the participation rates of the prime-age group (25-64) and of the age group 20-24. The age groups 14-19 and 65 and over followed the same pattern as the male participation rates for these groups. The figures from Bowen and Finnegan (op.cit., p. 56) show that for the pre-World War II period, the rate of the age group 14-19 declined from 26.8 per cent in 1900 to 18.8 per cent in 1940. During the same period the rate of the 65 and over age group declined from 9.1 per cent to 5.9 per cent. Unlike the male participation rate for the age group 20-24 which declined over this period, the female participation rate increased from 32.1 per cent to 45.1 per cent. The female participation rate for the prime-age group also increased over this period from 16.6 per cent to 26.2 per cent. The over-all effect was an increase in the total female participation rate from 20.4 per cent to 25.4 per cent.

The upward secular trend of the total female participation rate continued unabated in the post-war years. The total rate for females aged 16 years and over increased from 31.8 per cent in 1947 to 43.9 per cent in 1972.30

During this period all age groups showed an upward trend in their participation rates.31

31. Ibid.
Perhaps one of the most striking phenomena about the behaviour of the female labour force in the post-war years is the increased role of married women. Baerwald has noted that:

While total labor force participation of single females remain almost unchanged between 1947 and 1967 there was a very sharp increase in the labor force participation of married women. This is most strikingly the case for women in the 45 to 64 age bracket where the participation rate more than doubled from 18.4 per cent in 1947 to 40.4 per cent in 1967. The total labor force participation of married women rose from 20 per cent in 1947 to 36.8 per cent in 1967.32

The figures from the Manpower Report of the President 1972 (op.cit., pp. 165-166) show that while the total participation rate of single females increased from 51.2 per cent in April 1947 to 54.9 per cent in March 1972, that of married females increased from 20.0 per cent to 41.5 per cent over the same period. The rate of the 45-64 age group continued its steep increase reaching 44.2 per cent by March 1972.

The Trend of Average Hours.

The important feature of this section is to suggest that there has been a noticeable change in the behaviour of average hours worked in the post-war years compared to the pre-war period. In particular, the downward trend in average hours which characterized the pre-World War II years of this century has flattened out significantly and may have even reversed its slope. It is important to emphasize this point since labour economists continue to analyze the behaviour of average hours as if labour were con-

tinuing to demand shorter working hours. Thus while some attempt has been made to explain the behaviour of the total female participation rate outside the classical framework of the strict leisure/work dichotomy, no attempt has been made to explain labour's reluctance to increase its demand for leisure in the post-war period.

While there has been little or no attempt to explain the change in the trend in average weekly hours, several writers have expressed an awareness of this change.

Since the end of World War II, the rate of reduction in hours of work has been perceptibly less than it was during the first three decades of this century. While the average workweek for non-agricultural workers decreased by nearly four hours a week during the first three decades of this century, the comparable reduction in the workweek (including expanded paid vacations and holidays calculated on an hours-per-week basis) since the end of the World War II was about one hour per decade.\(^\text{33}\)

Historically the average length of the workweek has come down about an average of 2 hours per decade. Between 1950 and 1960 there was no decrease.\(^\text{34}\)

Over the past century, the standard workweek of labour has been shortened by more than a third, and much of the credit for this reduction goes to the pressures (political and economic) brought by labor unions. In the last 25 years, however, there has been little concerted effort to reduce the workweek below 40 hours, except during periods of rising unemployment, when this is seen as a means of work sharing.\(^\text{35}\)

\(^{33}\) Levitan, Reducing Worktime as a Means to Combat Unemployment, op.cit., p.4.


For references to other authors who have observed this change in the trend of average weekly hours see chapter 1 of this thesis.
When we look at the data showing average weekly hours in the pre-World War II and post-World War II periods, it is clear that there has been a significant change in the rate of decline. This is shown in table 5.1 and chart 5.1.

### TABLE 5.1

Average Weekly Hours Worked by Private Non-Agricultural Workers (Including Part-Time Workers) Pre-World War II and Post-World War II, 5 Yearly Intervals.

<table>
<thead>
<tr>
<th>Pre-World War II</th>
<th>Post-World War II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td><strong>Hours</strong></td>
</tr>
<tr>
<td>1895</td>
<td>60.1</td>
</tr>
<tr>
<td>1900</td>
<td>58.5</td>
</tr>
<tr>
<td>1905</td>
<td>57.2</td>
</tr>
<tr>
<td>1910</td>
<td>55.6</td>
</tr>
<tr>
<td>1915</td>
<td>53.4</td>
</tr>
<tr>
<td>1920</td>
<td>50.6</td>
</tr>
<tr>
<td>1925</td>
<td>49.0</td>
</tr>
<tr>
<td>1930</td>
<td>47.1</td>
</tr>
<tr>
<td>1935</td>
<td>41.7</td>
</tr>
<tr>
<td>1940</td>
<td>42.5</td>
</tr>
</tbody>
</table>

| **Year**         | **Hours**        | **Percentage Change** |
| 1948             | 40.0             | 0.0                  |
| 1953             | 39.6             | -1.0                 |
| 1956             | 38.5             | -2.8                 |
| 1963             | 38.6             | 0.8                  |
| 1969             | 37.8             | -2.6                 |
| 1972             | 37.1             | -1.9                 |


The change in the trend of average weekly hours is more significant when we take into consideration the fact that in the post-World War II period the number of part-time workers have increased relative to the total labor force. In the previous section dealing with the trend in female participation rates it was noted that an important phenomenon of the post-World War II period was the increased participation rate of married females. Since most
Chart 5.1
Average Weekly Hours of Work: Private Non-Agricultural Worker.

PRE-WORLD WAR II

POST-WORLD WAR II


TIME
married women work part-time this is one of the most important factors in the relative increase of part-time workers in the post-World War II period.

There is much evidence to suggest that the decline in average weekly hours in the post-World War II period is due to the relative increase in part-time workers rather than a decline in average weekly hours worked by full-time or primary workers. Levitan (op.cit., p.5) is probably overly cautious when he says that:

Another factor which has helped to bring about a reduction in average hours during the postwar period has been an increase in part-time workers. These workers have accounted for a significant proportion of the employment expansion in retail trade and service industries. In 1940 part-time workers who averaged less than 22 hours per week made up 7.2 per cent of the labor force; fifteen years later their proportion had risen to 11.8 per cent. The number of those who averaged less than fourteen hours per week had more than doubled, and they now constitute 7 per cent of the total work force.

The effect of part-time employment on average weekly hours in the post-war period was significant enough to produce the following comment by the United States Department of Labor. "The workweek had drifted downward throughout the 1960's, as the continued increase in the number of part-time workers in the labor force affected average hours."36

One way in which we can get a better perspective on the trend of average weekly hours in the post-war period is to look at the

data by industry division. Since part-time workers, primarily married females, tend to dominate the service and retail trade sectors we would expect the decline in average weekly hours to be concentrated in these sectors. This hypothesis is clearly supported by the data in table 5.2.

If we take manufacturing as typical of an industry employing primarily full-time workers, the change in the trend of average weekly hours between the pre-World War II and post-World War II periods is quite pronounced. Average weekly hours in manufacturing declined from 51.0 in 1909 to 40.3 in 1946. For the post-World War II period we observe an increase in average weekly hours in manufacturing from 40.0 in 1940 to 40.7 in 1973.

The series compiled by Owen for the period 1940-1961 showed that while average weekly hours for all non-agricultural workers declined from 41.9 in 1940 to 38.7 in 1961, average weekly hours for non-student male workers declined from 43.1 in 1940 to 42.3 in 1961. Owen adjusted the latter series to take account of increased paid vacations and holidays in the post-war period. After this adjustment average weekly hours of non-student male workers declined from 42.5 in 1940 to 41.2 in 1961.


38. Even when we take into consideration the fact that paid holidays and vacations have reduced hours worked per year from about 38 in 1940 to about 100 at the present time (Levitan, op.cit., p.7) it is still clear that there has been a fall in the rate at which average hours are declining in the post-World War II period compared with the earlier period.

### Table 5.2

Average Weekly Hours Worked by Private Non-Agricultural Workers, by Industry Division, in the Post-World War II Period, **5 yearly intervals**.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Mining</th>
<th>Construction</th>
<th>Manufacturing</th>
<th>Transportation &amp; Public Utilities</th>
<th>Wholesale trade</th>
<th>Retail trade</th>
<th>Finance, Insurance, Real Estate</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948</td>
<td>40.0</td>
<td>38.4</td>
<td>30.1</td>
<td>40.0</td>
<td>(1)</td>
<td>41.0</td>
<td>40.2</td>
<td>37.9</td>
<td>(1)</td>
</tr>
<tr>
<td>1953</td>
<td>36.6</td>
<td>36.8</td>
<td>37.9</td>
<td>40.5</td>
<td>(1)</td>
<td>40.6</td>
<td>39.1</td>
<td>37.7</td>
<td>(1)</td>
</tr>
<tr>
<td>1958</td>
<td>36.5</td>
<td>38.0</td>
<td>36.8</td>
<td>39.2</td>
<td>(1)</td>
<td>40.2</td>
<td>38.1</td>
<td>37.1</td>
<td>(1)</td>
</tr>
<tr>
<td>1963</td>
<td>38.6</td>
<td>41.6</td>
<td>37.3</td>
<td>40.5</td>
<td>41.1(2)</td>
<td>40.6</td>
<td>37.2</td>
<td>37.5</td>
<td>36.0(2)</td>
</tr>
<tr>
<td>1968</td>
<td>37.0</td>
<td>42.6</td>
<td>37.4</td>
<td>40.7</td>
<td>40.6(2)</td>
<td>40.1(3)</td>
<td>34.7</td>
<td>37.0</td>
<td>34.7</td>
</tr>
<tr>
<td>1973</td>
<td>37.1</td>
<td>42.5(3)</td>
<td>37.2</td>
<td>40.7</td>
<td>40.4(3)</td>
<td>32.8(3)</td>
<td>33.2</td>
<td>37.2(3)</td>
<td>34.1(3)</td>
</tr>
</tbody>
</table>

**Notes:**
1. Separate data not available.
2. 1964 figures.
3. 1972 figures.

Further evidence of a change in the trend of average weekly hours is provided by the increase in over-time work and moonlighting in the post-war period. Carter and Marshall (op. cit., p. 397) notes that:

Recently, union interest in shortening the workweek appears to have been motivated by an attempt to initiate over-time rates at an earlier stage, or by a desire to share limited work opportunities during recessions, than by a real increased desire for leisure.

With regard to moonlighting, Bloom and Northrup have observed that:

From the three cases cited, it is apparent that hours shorter than 40 per week do not yield discernable improvements in efficiency. They do seem to encourage people to make productive use of their time by seeking other work. In May, 1963, a total of 3.9 million persons were counted as moonlighters - that is, they held two jobs or more - an increase of 600,000 over the previous year. Since many moonlighters do not report their second activity in order to avoid taxes, or union or employer censure, the actual number is probably greater.40

Moore and Hedges (op. cit., pp. 6-7) have observed that in May 1970, total hours worked by full-time workers averaged 45 hours per week. They note that:

Among those who work long hours are the 'moonlighters', those who hold two or more jobs. In May 1969, about 4 million persons, more than 5 per cent of all workers, held two jobs or more at the same time. About half of them worked 55 hours or more during the survey week.

The number of workers who put in overtime on their regular job is much larger than the number of moonlighters. In May 1970, 14.5 million workers were on extended workweeks. The prevalence of overtime work has been increasing as scheduled overtime for day-to-day operations has become an integral part of the wage-hour structure.

Data on weekly overtime hours in manufacturing are available beginning 1956. Such data show that average weekly overtime hours in manufacturing increased from 2.8 in 1956 to 3.5 in 1972.\(^41\)

5.4 THE RELATIONSHIP BETWEEN MARKETING AND THE SUPPLY OF LABOUR IN THE POST-WORLD WAR II PERIOD.

It was argued in the previous section that there has been a noticeable change in the household's demand for leisure in the post-war period compared to the earlier period. In particular, the average household in the post-war period is more strongly motivated towards higher income and consumption levels than towards increased leisure. The components of the labour supply function which have produced the change in labour supply are increased female participation rates, especially the rate of married women, and a reluctance by workers to reduce further average weekly hours.

The basic hypothesis put forward here is that the observed change in the behaviour of labour can be explained by the increasingly important role which marketing activity plays in an affluent society. It is suggested that increases in marketing activity are responsible for the outward shifts in the instantaneous labour supply curve described in section 2 of this chapter.

\(^{41}\) Manpower Report of the President 1972, Table C-10, p.199.
After analysing the relationship between marketing and the supply of labour in the post-war period an attempt will be made to relate the explanation given here for the observed behaviour of the labour supply in the post-war period to some of the more recent theories of labour supply. These theories attempt to explain the observed secular pattern of components of the labour supply outside of the strict classical dichotomy of time between hours of labour and hours of leisure. 42 In the final section of this chapter an attempt will be made to provide some empirical support of the hypothesis put forward here by testing an aggregate labour supply function with some index of marketing as one of the independent variables.

To this writer's knowledge, there has been no previous attempt to analyse the effect of marketing activity on the behaviour of the household's or the aggregate labour supply function. In the past unions have sometimes argued for a reduction in hours worked on the grounds that increased leisure would permit workers the time necessary to spend more on consumer goods which are not absolute necessities. However, as Bloom and Northrup (op.cit., pp.475-476) correctly point out this argument might have had some relevance when workers were employed 12 hours a day and therefore had little time for anything other than to eat and sleep.

But how much more the average worker's family will spend on consumption goods if his hours are reduced below 40 is not easy to determine. Since the worker's family spend the bulk of his income on consumption goods, it may well be that he is about as good a customer for the non-essential items of industrial production as can be expected. Moreover, this leisure argument assumes, first, that the increased costs resulting from decreasing the hours will not adversely affect employment and therefore, in turn, adversely affect consumer expenditures, which, as we shall point out, is likely to occur; and second, it also assumes the shorter-hour movement will not be simply a device to increase overtime pay. Where actual hours are not reduced but merely made more expensive by penalty overtime payments, the increased leisure argument is irrelevant; for here, the workers' take-home pay, not the workers' leisure, is increased.

A certain amount of leisure time is obviously necessary for consumers to be able to enjoy luxury and recreational goods in an affluent society. "Moreover, the employee who works shorter hours receives a greater saturation of advertising over radio, television, and other media, and this may make him more desirous of spending to 'keep up' or to enjoy the latest conveniences or luxuries." (Bloom and Northrup, op. cit., p.476). However, this process itself has a negative feedback on the workers' work/leisure trade-off. For to be able to afford the consumption goods necessary to the enjoyment of leisure time in the affluent society the worker must spend more time earning income. The relevance of marketing in the process is that marketing is the mechanism through which new consumption goods are created and brought to the attention of the worker. Marketing must find new ways for the worker to enjoy or economize on his leisure time. It must find ways of making new and old goods attractive enough to the worker so that he will trade off a little more of his leisure time to earn the extra income necessary to purchase
these goods. Harold Vetter (op.cit., pp.500-501) emphasizes this point in his discussion of the Backward Sloping Supply Curve.

In a "Madison Avenue economy," like the American, all strata of the labor force are bombarded with the alleged delights of proliferated consumption habits, and a rising level of living is an accepted goal... The offer curve of labor services in all probability continues even further upward and to the right than is customarily believed under the influence of the consumption content of leisure. This concept is intended to convey the well-known fact that the enjoyment of leisure in an advanced economy is becoming less and less (if it ever was) a phenomenon of inactivity and rest, and more and more a phenomenon of consumption of a wide variety of recreational consumption goods. Leisure is pleasurable, work is painful. Hence, the theorists of the regressive supply curve conclude, the prospect of ever higher wages influences the worker to buy more leisure.

This conclusion overlooks the influence of the modern paradox: To buy more leisure requires more, not less, work to buy the high cost, leisure-time products without which leisure time, unfortunately as some would say, has become an empty, vain experience. The classification referred to earlier - leisure versus non-leisure goods - breaks down. As a student bluebook once neatly put it, "leisure... is not particularly wanted without wealth. In our culture the idea that one works to obtain money to buy leisure is a leisure class idea, not a working class one." The paradox means that the worker is in a sense chasing his shadow: To fill his leisure time with recreational goods he must work more, even at higher wage rates, to enjoy the leisure time, which of course must be forgone in order to work,... etc. The general point of the paradox for the present discussion is that the worker will continue to chase his shadow, under the Madison Avenue spell, for quite some time.

This point has also been made quite strongly by Baerwald (op.cit., p.259). He says that:

The increase in leisure time has not diminished the total demand for remunerative employment. On the contrary, since leisure-time activities require such high-cost items as boats, advanced hi-fi equipment, and extensive travel, the need to increase earnings of household members during the five-day week becomes more urgent. Actually we are facing here an important aspect
of the aggregate-employment problem: multiple job holding. This phenomenon has two different sources. In many instances it may implement an inadequate income derived from the main occupation while in others it may be attributable to the desire to raise the joint income of the household to higher levels.

Like Vatter, Baerwald points out that marketing plays a crucial role in influencing the demand for increased employment.

The great production possibilities of highly industrialized areas in which labor requirements and employment do not keep pace with actual and potential growth in output have not diminished the aggregate demand for employment but rather have tended to increase it. This is because the great material wealth that is continuously being produced and advertised stimulates consumer demand and expectations, thereby necessitating a steady increase in household income. These attitudes and needs in turn increase the number of family members who are actually employed or looking for jobs. Rising educational requirements for better-compensated jobs raises family expenditure further, again augmenting the need for additional employment and income. 43

The relationship between consumption and marketing has been investigated both in this thesis and in other studies. These studies support the hypothesis that marketing shifts up the con-

43. Ibid., p. 259. Note that in the last part of the quote Baerwald is hinting at the idea put forward earlier in this thesis that marketing induces workers to seek "better-compensated" jobs and that one of the ways in which they can secure better paid jobs is to increase their education. This increases the productivity of labour. However, Baerwald correctly points out that by requiring additional expenditure by the household it directly increases the supply of labour by the household.

44. For a reference to these other studies see chapters 2 and 4 of this thesis.
consumption function through time, in favour of greater consumption. Unless the increase in consumption is entirely at the expense of savings, in which case the process will be short-lived, it follows logically that marketing must also shift up the labour supply function in favour of increased hours of labour.

So far this implied relationship between marketing and the supply of labour has either remained implicit or has been referred to explicitly only as a passing observation. For example, the relationship between marketing and the supply of labour is implicit in most of the writings on the backward bending supply curve of labour. When writing on this subject, the authors invariably note that the point at which the supply curve of labour begins to bend back is determined by the extent to which workers are "consumption conscious." The extent to which workers are "consumption conscious" will depend on the level and sophistication of marketing activity in the society. Moreover, the degree of consumption consciousness in a society is not fixed and unchanging. It develops with the material progress of that society and with increasing marketing activity.

45. Indeed Vatter (op.cit.) has made the point that in a "Madison Avenue economy" like the American, the demonstration effect is likely to induce the average worker to move out of the low-income, dissaving category, to the high income, positive saving category. This means that instead of marketing shifting up the consumption function entirely at the expense of saving, the effect of marketing might be to induce workers to increase their work effort so that they increase both consumption and savings over time.

46. Unless workers can obtain higher real wage rates. The effect of marketing on wage rates is considered in the next chapter.
Many economists have been more explicit in observing the relationship between marketing activity and the household supply of labour. For example Woods and Ostry note that:

> In our society, growing cultural pressures for over-higher consumption exerted both by advertising and the force of 'competitive emulation' have probably induced many married women to enter the labour market. Some may well be kept there by the fear of the wolf at the door - in the shape of the consumer credit agency.  

Kjellberg expresses the same point of view when he says that, "It may also be, as has been suggested, that the availability of credit to finance consumer purchases has encouraged greater work effort, especially through greater female participation in the labour force."  

In arguing the case against restriction of consumer credit, Katona points out that, "... such credit restraints would impede consumers in improving their standard of living and would therefore have adverse consequences on people's striving toward higher income and exerting greater productive effort."  

Commenting on the role of advertising, Walker says that, "The workers' standard of living is improved by advertising as it introduces to them new products, which make life more comfort-


table and happier. As a by-product of this stimulation of desire is the immediate stimulation to hard work. It seems that until a man’s desires, and probably also his commitments, are running ahead of his income he will not have the incentive to take that extra effort.50

In considering the effect of advertising on the consumption function, Simon points out that, "Advertising might affect consumption even if the propensity to consume remains constant, if advertising leads to more moonlighting.51

5.5 SOME "NON-CLASSICAL" THEORIES OF LABOUR SUPPLY AND THEIR RELEVANCE TO THE PRESENT HYPOTHESIS.

The Classical theory of labour supply postulates that the individual has a strict two-way choice in his allocation of time. Given his preference function for income and leisure, he allocates his time between work and leisure such that his subjective marginal rate of substitution between income and leisure is equated to the market wage rate. On the basis of this theory, the observed secular decline in average weekly hours of work is regarded as evidence in support of the hypothesis that the income effect of a rise in real wage rates dominates the substitution effect and that both the individual’s and the aggregate labour supply curve is backward bending.

The behaviour of the labour supply in the post-World War II period, i.e., the increasing female participation rate and the


change in the trend of average weekly hours, has been put forward as evidence to support the hypothesis of this thesis that while the instantaneous labour supply curve is likely to be backward bending as suggested by the Classical school, it is subject to outward shifts through time due to increasing marketing activity. The purpose of this section is to consider the basic hypothesis of this thesis within the context of two recent theories of labour supply, i.e., the theories of Becker and Mincer.

**Becker’s Theory of the Allocation of Time.**

Becker attempts to formulate a more general theory of the allocation of time than the Classical theory by recognising that the consumption of commodities requires time and the enjoyment of leisure time often requires the use of commodities. In Becker's model the individual has a three-way choice in allocating his time. He can spend his time at work, he can spend his time consuming time-intensive commodities, or he can spend his time consuming goods-intensive commodities. Time intensive commodities are those commodities which require relatively large units of time per dollar value of goods in the consumption process. Goods-intensive commodities are those commodities which require relatively large dollar value expenditures per unit of time in the consumption process. For example, reading a book is a time-intensive commodity whereas going out to a night club is a goods-intensive commodity.

Becker’s model is more general than the Classical model in that the individual can substitute not only between work and
leisure, but also between time-intensive and goods-intensive commodities. Consider the reaction of the typical individual in Becker's model to a rise in the real wage rate. The rise in the real wage rate makes leisure more expensive inducing the individual to substitute work for leisure. This is the usual substitution effect of the Classical model. As in the Classical model the income effect induces increased consumption of all goods including leisure thus reducing hours of work. However, in Becker's model there is the further substitution effect from time-intensive to goods-intensive commodities, caused by the increase in real wages. Since time-intensive commodities are now more expensive in terms of foregone earnings, the individual substitutes goods-intensive commodities. But to do so, he must increase his supply of labour since he can only acquire more goods-intensive commodities by increasing his income. Alternatively, the switch from time-intensive to goods-intensive commodities increases the total supply of non-working time available to the individual thus allowing the necessary increase in his supply of labour.

Although Becker did not use his model to explain labour behaviour in the post-World War II period, i.e., the trend of average weekly hours and increasing female participation rates, his model is well equipped to perform such a task. Consider first the case of increasing female participation rates. This phenomenon cannot be explained within the Classical model since that model would predict the opposite occurrence during a period of rising real wage rates. Some labour economists have attempted
to explain this phenomenon outside the Classical framework by suggesting that the increased use of household appliances has increased the leisure time of housewives thus allowing them to engage in market work.

This is an extremely weak explanation for two reasons. It assumes that the appearance of household appliances is exogenous. Secondly it does not explain why housewives, freed from the chores of labour-intensive housework, would not prefer leisure to market work, especially since the income of the household is now higher than before.

The alternative explanation provided in this thesis fits in neatly with Becker's model. As suggested in this thesis, marketing is the exogenous variable which makes available the labour-saving household appliances. Marketing is responsible for the new product research which makes it possible to produce these appliances. Marketing is responsible for the advertising, selling effort, and credit facilities, necessary to facilitate consumer purchase of these appliances.

In purchasing household appliances, housewives are making a switch from time-intensive commodities - housework without appliances - to goods-intensive commodities - housework with appliances. However, as noted earlier, income must be increased to enable the purchase of goods-intensive commodities, and this explains the increase in labour supply by housewives.

The post-war trend in average weekly hours can be explained within the context of Becker's model in a similar fashion. Goods-intensive commodities such as yachts, cars, summer homes, visiting
summer camps and night clubs do not simply happen to be available because real wage rates have increased. They are all the product of marketing activity. However, it is true that the higher the real wage rate the more of these commodities will be consumed at the expense of time-intensive commodities, thus producing the seemingly perverse situation that more labour is supplied as incomes get higher.

Mincer's Model of Labor Force Participation of Married Women. 52

The historical behaviour of the participation rate of females, especially the rate of married women, has bothered labour economists ever since the concept of the backward-bending supply curve of labour was used as an empirical generalization of labour-force behaviour. For, according to this concept we should observe a decline in labour force participation of married women as incomes have increased enormously, perhaps sixfold from 1890 to 1960. 53

It was suggested in the previous section that the observed labour-force behaviour of married women could be explained within the framework of Becker's model. Becker did not use his model for this purpose. It was left to Mincer to develop a rigorous model to explain this phenomenon. However, although not immedi-

52. For an application of this model to Canadian data see Skoulas, op.cit.

tely obvious, Mincer's model is similar to Becker's model in analytical content. Mincer developed a model in which housewives have a three-way choice of allocating their time. They can allocate their time to market work, non-market work, i.e., housework, or leisure. As in the case of Becker's model, this allows substitution not only between work and leisure, but also between market work and non-market work. The effect of a rise in the real wage rate is to induce the substitution of market work for housework causing an increase in the supply of labour as real wages increase.

Mincer correctly points out that the extent to which market work can be substituted for housework will depend on whether there are market goods available to perform the task of the housewife in the home - household appliances - and to substitute for home produced goods - homemade dresses vs. ready-made dresses in the store. This is where marketing activity again shows up as the essential ingredient to close the model. Marketing activity is the mechanism through which market goods are made available and attractive, inducing the substitution of market

Note that all individuals have this three-way choice. Mincer concentrates on housewives since a particular kind of non-market work, i.e., housework, accounts for a significant part of the time of housewives.
goods for home-produced goods and household chores. In doing so it increases the non-working time available to the individual allowing him to increase his supply of labour, thereby increasing his or her income to be able to purchase the market goods.

While these forces blunted the rise in family income, the opportunities for expenditure proliferated as stars from a Fourth of July Rocket. The dazzling array of material goods now incorporated into the American standard of living proved to be the key incentive for increased female worker rates in recent decades. We may define this as the means to an easier life; as the desire to keep up with the Joneses (as they keep up with the Smiths); as the crass materialism characteristic of the postwar Byzantine periods in world history, etc. But, whichever of these interpretations are preferred by the specialists in these matters, the result is the same. In recent years in the United States, the consumer in 'consumer durables' has proved to be the working wife.

A recent study, made for quite different purposes, throws a brilliant light on one side of this problem ... families with working wives not merely have higher incomes, but more commonly acquire debts despite, or because of, the wife's work. It is doubtful, on the latter alternative, whether it is possible to know (or particularly useful to assert) the priority of the chicken or the egg. Work by the wife and the incurring of debts are interrelated means to the prompt acquisition of consumer durables." (Lebergott, op.cit., pp.66-67.

As in the case of Becker's model, the implicit causal variable in Mincer's model is the change in the real wage rate. These models therefore emphasize substitutions caused by price changes. However, without marketing activity to provide and make desirable the consumer goods, the substitution between time-intensive and goods-intensive commodities in the case of Becker, and between market work and non-market work in the case of Mincer, cannot take place. Hence, marketing is a necessary condition. It is also a sufficient condition if the new goods made available by marketing are more attractive than the old goods which are being given up. And a priori we would expect this to be so. However, the sufficient condition need not be emphasized since it is observed that real wages are increasing. The rise in real wages is partly induced by marketing activity as a substitute for even further increases in the labour supply. Thus the Classical hypothesis that a rise in real wages causes a fall in the quantity of labour supplied, remains valid. The labour supply increases not because the supply curve is positively sloped but because it shifts out due to increases in marketing.
5.6 **EMPIRICAL TESTS: MODELS, VARIABLES AND ECONOMETRIC PROBLEMS.**

The analysis so far has been based on intuition and logical argument. This methodological procedure is in agreement with the Classical analysis of the labour supply. Empirical testing of the labour supply began only with the work of Douglas, *op.cit.*, who restricted his study to the use of cross-section data. The study by Long, *op.cit.*, which is still the classic reference on empirical investigations of the labour supply, was an attempt to fill the gaps left by Douglas in his cross-section study, and to provide for the first time an empirical study of the behaviour of labour supply over time.

The advantage of a time-series study over a cross-section study of the labour supply is that the former can consider explicitly any dynamic factors which cause the conventional moment-of-time short-run labour supply curve to shift over time. A primary objective of Long's time series study was to attempt to identify these dynamic factors. His time-series study is therefore directly relevant to the present study. And since the hypothesis to be tested is whether marketing causes an outward shift in the conventional short-run labour supply curve over time, the only studies which are relevant are time-series studies.

Time-series studies of the labour force, whether intended to explain cyclical or long-run behaviour, concentrate exclusively on the behaviour of participation rates to the neglect of ave-
rage hours of work. It is as if the hours issue had been settled by the generalization that the income effect dominates the substitution effect. But if this is an explanation of the behaviour of average hours in the pre-World War II period, it is surprising that labor economists should not want to offer an explanation for the following phenomenon:

For over one hundred years prior to 1950, American labor saw working hours decline and opportunities for leisure (or additional work) increase. Since 1950, regular hours of work have stabilized at 40 per week and 8 per day.

The objective in this thesis is to explain all dimensions of the labour supply and not simply participation rates. For this reason, the dependent variable is the aggregate labour supply measured in man-hours per week.

**Definition of Variables.**

The dependent variable is the aggregate labour supply. The


59. This variable incorporates two dimensions of the labour supply concept - hours of work and participation rates. In the labour supply literature a third dimension of the labour supply - efficiency - is often referred to. This dimension of the labour supply is dealt with indirectly in the next chapter. It has been noted in various parts of this thesis that marketing affects the efficiency of labour, by inducing wage-push which in turn has repercussions on job shifts, education, training, and other ways of increasing labour efficiency.
empirical concept which comes closest to this theoretical construct in the case of the United States is the civilian labour force aged 16 years and over.\textsuperscript{60} The unit of labour-force measure, however, is persons, not man-hours. To get from persons to man-hours, the labour-force is multiplied by average weekly hours for non-agricultural workers. If this variable is denoted by \( L \), variations in \( L \) reflect variations both in participation rates and in average weekly hours. It was noted earlier that the trend of average weekly hours for all non-agricultural workers in the post-war period tend to exaggerate the decline in average weekly hours because of the increase in part-time workers during this period. One way of standardizing for this factor is to multiply the labour-force by average weekly hours for manufacturing workers since part-time workers, primarily married females, tend to be concentrated in retail trade. This measure of the labour supply is denoted by \( L_M \). Hopefully, this variable reflects both the increase in participation rates of females, and the standardization of average weekly hours for full-time workers in the post-war period.\textsuperscript{61}

\textsuperscript{60} The labour force is the sum of persons employed and persons unemployed. See the discussion on concepts of Labour Supply in Section 1, of this chapter, and Ostry and Zaidi, op.cit., p.6.

\textsuperscript{61} For the time-period covered by the empirical study, 1947-72, average weekly hours for non-agricultural workers declined from 40.3 in 1947 to 37.2 in 1972 while average weekly hours for manufacturing workers remained almost unchanged, 40.4 in 1947 and 40.6 in 1972. This is reflected in the two dependent variables by \( L \) increasing from 2391.8 million hours in 1947 to 3212.2 million in 1972 and \( L_M \) increasing from 2397.7 million hours in 1947 to 3513.6 million in 1972 (see data in Appendix C).
The first independent variable which is suggested by the theoretical discussion is the real wage rate. Average hourly earnings in constant 1958 dollars is used as the variable which measures the average remuneration per man-hour of labour supplied in the non-agricultural sector. This variable is denoted by \( W \). When \( L_M \) is used as the dependent variable, the wage-rate variable used is average hourly earnings in manufacturing in constant 1958 dollars. This is denoted by \( W_M \).

The relationship between \( L \) and \( W \) (and between \( L_M \) and \( W_M \)) reflects the moment-of-time variation between aggregate labour supply and its average rate of remuneration. This is the basic Classical relationship. It provides a test of the empirical generalization that the aggregate labour supply curve is backward bending. If the coefficient for \( W \) is negative then the hypothesis that the income effect dominates the substitution effect is supported. If the coefficient for \( W \) is positive, then the hypothesis is not supported by the empirical evidence.

The second independent variable which is suggested by the theoretical discussion is some index of marketing.\(^{62}\) This is denoted by \( M \). While the real wage rate explains the moment-of-time variation in the aggregate supply curve, marketing explains the shifts in the aggregate labour supply curve over time. Since increases in marketing are hypothesized to produce outward shifts

\(^{62}\) For explanations of the various indices of marketing used see chapter 2 and Appendix B.
in the aggregate labour supply curve, a positive value for the coefficient of marketing indicates that the data supports the hypothesis, while a negative or statistically insignificant value implies that the hypothesis has not been supported by the empirical evidence.

Previous attempts to distinguish between moment-of-time and over-time relationships with regard to the labour supply has been restricted to the behaviour of female participation rates. Nevertheless, it is worthwhile examining the explanatory variables suggested in these earlier studies, since the increase in female participation rates has significantly affected total labour supply in the post-war period.

Long was one of the first persons to attempt to explain the apparent contradiction between empirical cross-section studies which supported the underlying prediction of the backward bending supply curve as applied to female participation rates, i.e., that female participation rates fell as real incomes increased, and observed behaviour over time, by distinguishing between static and dynamic factors. Since Long's study, several other authors have emphasized the relevance of dynamic factors. However, the following quote from Long's comment on Mincer's article (op.cit., pp.98-99) provides an excellent summary of the existing consensus:

63. This is not surprising in view of the fact that the behaviour of female participation rates over time was the most obvious case in which the static backward bending supply curve concept failed to explain dynamic behaviour.

64. See Long, op.cit., chapter 7.

65. See in particular, Bowen and Finegan, op.cit., chapter 7.
Do these rising incomes have the effect of bringing more wives into the labor force or of driving out some of those now working?

On this question there has been a confusion of evidence, especially as between moment-of-time and over-time relationships...

What has been the cause of this apparent contradiction between the inverse behaviour at a moment of time, and the positive behaviour over time? Various studies, including my own, have attributed it to the difference between static factors at a moment of time and dynamic factors over time, the latter including (1) declining burden of housework due to fewer children, better appliances, more outside services for the home; (2) declining hours of work in office and factory jobs so that more women could perform a dual function of wage earner and wife or mother; and (3) the opening up of new job opportunities for women. Other dynamic forces were also explored; rising wages and improved education of females, relative to males; and the push and pull of young and older males who were, on net balance, leaving the labor force.

Given the long list of dynamic factors which might affect the labour supply, it seems necessary to justify the use of a single variable such as marketing, and to see whether there is any relationship between marketing and the dynamic variables suggested by Long and others.

With regard to the use of a single variable such as marketing to capture the dynamic forces affecting labour supply, the following apologies made by Long and by Bowen and Finnegan with regard to their own studies is equally applicable to the present case.

My study even attempted some simple statistical illustration of how these various dynamic factors may have contributed to the inflow of wives into the labor force. But it did not attempt to set up a rigorous analytical model, because the factors seemed too numerous, the relationships among them too complex and changing, and their statistical measurement too inadequate to permit us to fit them into any mathematical framework. (Long,
It is evident that there is a considerable gap between an ideal model of labor force decisions and the simple models we use in this study. To be sure some set of simplifying assumptions is an essential part of the economizing process as it applies to empirical research in general, and simplification qua simplification is hardly cause for apology. Indeed, it is an essential aspect of the scientific method. (Bowen and Finnegan, op.cit., p.32).

With regard to the relationship between marketing and the dynamic variables suggested by Long and others, a close examination suggests that marketing has an impact on most of these variables. Let us consider the dynamic forces suggested by Long in turn, beginning with the last.

The push and pull of young and older males as an explanation for the increase in female participation rates has been criticized by Cohen (op.cit., p.70). Long advanced this hypothesis in chapter 13 of his book where he examines the "over-all stability versus internal variation in a nation's labor force participation." Cohen gives several reasons why he finds Long's hypothesis untenable, the most important being the failure of Long's hypothesis to explain the great increase of women in "the traditionally female occupations, and the elderly male exodus from the historically male occupations."

Rising wages of females relative to males, as an explanation for increased female participation, was not supported by the data studied by Long. "The data on labor force and earnings presented in the study do not support the hypothesis that the increase in female labor force has been due to the rising ratio of female to
male earnings at least in recent decades. 66

By improved education of females relative to males, it is clear from Long's text that he means improved education of females relative to older males. "And there was a marked rise over time in the ratio of education completed by females aged 20 and older to that completed by older men..." 67 In this respect Long was again advancing his hypothesis of females pushing out older males, which has been discredited by Cohen. And Long himself admits that, "... the ratio of women's education to that of older men tended to rise less than the ratio of women's participation to that of older men. Also, the movements of these ratios were not very similar from decade to decade." 68 However, what is relevant in the present context is not simply whether the increase in education of females relative to older males increases female participation rates, but whether increased education increases labour supply from whatever source this may be. On this the evidence is clear that increased education increases the participation rates of both males and females for all age groups. 69

One of the hypotheses advanced in this thesis is that there is a close correlation between marketing and education. It has

66. Long, op.cit., p.10. See also pp.133-134.
67. Ibid., p.10. See also p.136.
68. Ibid., p.136. See also p.11.
69. Bowen and Finegan, op.cit., chapters 3, 5, 8, 9 and 12. See also Long, op.cit., pp.94-96.
been suggested that this works via the labour market with marketing inducing workers to push for higher wage rates and labour being willing to increase their education and skills to secure better paid jobs. From this point of view, marketing is the causal variable which leads to an increase in education, which leads to an increase in the supply of labour.\textsuperscript{70}

The dynamic factor listed as number (3) by Long, i.e., opening up of new job opportunities for women, while an essential condition for increased employment of females, is not in itself a causal factor. As Long himself notes:

The rise in the female labor force participation could scarcely have occurred without an expansion of opportunities for female employment. But where did these openings occur, and why? Was it because the usefulness of women was enhanced by their improved education and training, because girls and women were needed in bakeries, stores, and factories to produce and sell things which they were no longer producing in their own kitchens, or because women may have been better suited to do the paper work, the semiskilled labor, and the sales and service functions demanded by modern industry, than to do the heavy farm and factory work of earlier years? (p.135).

Again it is not difficult to see the relevance of marketing to the possible reasons given by Long for the expansion of job opportunities for women.

The dynamic factor listed as number (2) by Long, i.e., de-

\textsuperscript{70} There are of course non-economic reasons for increasing your education. However, only economic reasons are relevant here, since education increases labour supply by increasing job opportunities and expected earnings. These economic reasons for increasing your education are related to the level of marketing activity in the society.
clining hours of work in office and factory jobs, though relevant to the issue, is rather misleading in the way it is often stated. While average hours of work for all workers declined in the period before World War II, average hours of prime-age males, and for full-time workers, in general, has remained relatively stable at 40 hours per week in the post-war period. Yet female participation rates have continued to increase and the participation rate of married women has increased fastest in the post-war period. The increase in female participation rates in the post-war period, therefore, cannot be attributed to "declining hours of work in office and factory jobs."

What has happened, of course, is that most married women who were entering the labor force for the first time, preferred, and were able to find, part-time employment, or at least employment where average hours of work were less than in the predominantly male occupations. For example, in retail trade which is a predominantly female occupation, average hours of work is less than in manufacturing.

In considering the effect of hours of work on the participation rate of married women, Bowen and Finegan seem more aware than Long,71 of the fact that it was the availability of part-time work rather than a shorter work week which was important. They admit that:

We know, for example that the postwar decline in the average work week for married women has come about

71. On the other hand Long's empirical studies ended in 1950, so he was still thinking in terms of pre-World War II conditions.
partly as a consequence of an increase in the relative number of part-time jobs - a change in work schedules which may well have led to an increase in participation which has more than offset the reduction in average hours worked. Particularly in the case of married women with young children, the availability of part-time jobs may be a crucial determinant of their ability to seek employment (op.cit., p.229).

Long and others who put forward the hypothesis that the decline in the length of the average work week is one of the dynamic factors responsible for the increase in female participation rates, are obviously still thinking in terms of pre-World War II conditions. They are accepting the hypothesis of a static backward bending supply curve of labour as far as hours are concerned, and are hypothesizing that this reduction in hours due to the income effect dominating the substitution effect as wage rates rise over time, is in turn operating as a dynamic factor inducing increased female participation in the labour force.

The above hypothesis cannot explain post-war behaviour since the length of the average work week is not declining. The alternative hypothesis put forward here is that marketing is responsible both for the post-war stability of average weekly hours and for the increase in female participation rates. Marketing acts as a dynamic factor shifting out the backward bending supply curve and so offsetting the extent by which the income effect dominates the substitution effect at a moment of time. This stabilizes average weekly hours over time. In addition marketing induces new labour into the labour force - increased female participation. However, these new entrants show a preference for part-time work or average weekly hours which are less than ave-
rage weekly hours worked by the traditional participants in the labour force, at least in the first instance.\(^{72}\) This preference for part-time work may require some adjustment of work schedules by employers which are likely to increase costs. This will be reflected by lower hourly rates being paid to part-time workers.\(^{73}\) As Friedman (\textit{op.cit.}, p.205) has suggested, employers have an incentive to adjust hours to the preferences of workers since by doing so they can "attract the better people or attract people at a lower wage rate."

The last dynamic factor listed by Long is the "declining burden of housework due to fewer children, better appliances, and more outside services for the home.

The relationship between marketing and the declining burden of housework due to better appliances and more outside services for the home has been discussed in the previous section. In that

\(^{72}\) i.e., they are likely to switch from part-time to full-time as they become accustomed to being in the labour force and as marketing continue to shift out their individual labour supply curves, over time.

\(^{73}\) There are cases where the demand for part-time work would reduce per unit costs. These would be cases where the optimal length of the "production run" is not some multiple of 8 hours per day, assuming that full-time workers work 8 hours per day. For example, if the "production run" is less than 8 hours, employing full-time workers would increase per unit costs. If the "production run" is 12 hours, part-time workers for the second shift will be cheaper than paying overtime rates. Recently, employers have been trying to get around this problem, by rearranging the work week from say 8 hours, 5 days per week, to 10 hours, 4 days per week. The success of this movement will of course depend on the preference of workers. See for example, W.J. Foster, \textit{The Rearranged Workweek of Four Days, Forty Hours With a Treatment of Military Applications}, U.S., Department of Commerce (Sept. 1972).
section it was suggested that the relevance of marketing can be analysed either in the context of Mincer's model of labour supply in which case marketing is the exogenous variable which makes available the better appliances and "more outside services" and thereby inducing the switch from housework to market work, or in the context of Becker's model of labour supply in which case marketing is the exogenous variable inducing consumers to switch from time-intensive housework-without-appliances to goods-intensive housework-with-appliances which requires an increase in the supply of labour.

The other reason given by Long for the declining burden of housework, i.e., fewer children, can also be related to marketing. Married couples have made a deliberate effort to postpone having children and to have fewer children, in the post-war period. One reason for this is the relative cost of bringing up children. As marketing has made more and more goods available for consumption by adults, it has altered the trade-off between these consumption goods and having children in favour of more of these consumption goods.

The preceding extensive discussion of the marketing variable has stressed the relevance of marketing to the dynamic behaviour of the labour supply. In our discussion we have drawn heavily on the works of Long and of Bowen and Finegan since these authors have been foremost in emphasizing dynamic factors, at least as far as female participation rates are concerned. Bowen and Finegan, writing at a later time than Long, were able to obtain more insights in the causal dynamic factors operating in the
post-World War II period. One such insight was the relevance of income aspirations to the dynamic behaviour of the labour supply in the post-war period. While restricting their discussion of the relevance of income aspirations to the behaviour of the participation rate of married women, it is clear from other parts of their text that their analysis is intended to apply to the supply of labour by the household as a single decision unit. This is what Bowen and Finegan has to say about the relevance of income aspirations:

Application of the cross-section income effect coefficients to changes over time in husband's income leads to the prediction that the participation rate of married women 14-54 years of age would have declined by almost 8 points between 1948 and 1965 (rather than rising by nearly 15 points) had the real income of husbands risen as it did but had all the other variables included in the intercity regression model remained constant. We believe that this inference, drawn from a blend of the results presented in Tables 7-3 and 7-4, is misleading.

We think it is misleading because it is based on a key assumption of shaky stature - that at each absolute level of husband's income (measured in constant dollars), the tastes of the typical household for additional income vis-a-vis home goods and leisure, were essentially the same in 1965 and in 1948. This is equivalent to asserting that a woman in 1965 whose husband had a certain real income would have felt no more of an inclination to work to acquire additional goods and services than a woman in 1948 whose husband had the same absolute level of real income. We find this hard to believe. Surely income aspirations have increased markedly over this period, as the general standard of living has risen, as intriguing new products have been introduced (and pushed by advertising campaigns which have had the television medium at their disposal over most of the post-war period), and as the "style" of life has changed in important respects (note, for example, the increasing desire for two homes).

... In short, the choice between leisure and more goods and services has no doubt been affected by the range of goods and services generally available. We are convinced that income aspirations have risen markedly over the post-war period and that rising income aspira-
tions have in turn had a positive impact on the participation rate of married women - a positive impact which has offset, at least in part, the negative impact of the increasing absolute level of real income suggested by the cross-sectional coefficients (op.cit., pp.234-235).

Other Independent Variables Included in the Labour Supply Equation.

Two other independent variables were included in the equation tested in addition to the real wage and marketing. These are total population aged 16 years and over, and time. The total population variable is denoted by N and the time variable by T. These last two variables are more in the nature of control variables than explanatory variables. N is intended to control for population increase over time and T is intended to control for other dynamic factors of which we are ignorant or cannot find measurable variables for.


Empirical tests using L or LN as the dependent variable attempt to estimate the variation in the aggregate labour supply without distinguishing the two sources of variation, i.e., variation due to changes in participation rates and variation due to changes in average weekly hours. In practice, existing empirical tests of the determinants of aggregate labour supply usually distinguish between these two sources of variation. There are several reasons for this.

The most obvious is that the particular study may be interested in only one of these two dimensions of the labour supply. In fact, many studies are only interested in one dimension of the
labour supply of a particular group of workers. For example, most post-war empirical studies of labour supply behaviour have concentrated on attempting to explain the participation rate of married women.

Another reason for looking at only one dimension of the labour supply is that some explanatory variables might affect one dimension and not another. This is especially true when the labour supply of a particular group is being studied. For example, in the case of the participation rate of married women, husband's income is an important explanatory variable which would not be relevant to studying the participation rate of single women. However, these less aggregative studies also have disadvantages. In particular, since the decision to supply labour is a household decision, it is somewhat unrealistic to attempt to estimate, for example, the participation rate of married women independently. Also, from this point of view, the household makes a simultaneous decision both on the participation rate of each of its members and on the degree of participation, i.e., hours supplied, by each member.\textsuperscript{74}

In the present study, the empirical tests involving the dependent variables \( L \) and \( L_M \) are intended to provide the primary test of the hypothesis that marketing increases the aggregate supply of labour over time. However, in view of the fact that most existing empirical studies have tested separately for par-

\textsuperscript{74} See Bowen and Finegan, \textit{op.cit.}, pp.29-31, for a further discussion of these points.
participation rates and average hours, it was considered instructive to provide alternative tests of the marketing hypothesis by looking at average hours and participation rates independently.

The Model With Average Hours.

The independent variables are average weekly hours worked in non-agricultural establishments and average weekly hours worked in manufacturing. The first variable is denoted $L_H$ and the second $L_{HM}$. Since there is no need to control for population changes in this model, the independent variable $N$ is omitted. In the model with $L_H$ as the dependent variable, the independent variables are $W$, $M$ and $T$, where $W$ is the real wage rate in non-agricultural industries, $M$ is some index of marketing and $T$ is time. In the model with $L_{HM}$ as the dependent variable, the independent variables are $W_M$, $M$ and $T$, where $W_M$ is the real wage rate in manufacturing.

The Model With Participation Rates.

In the post-war period, increases in the labour supply due to increases in participation rates is due exclusively to the increase in female participation rates. The dependent variable used in this model is therefore the female participation rate defined as females in the labour force as a percentage of the female population.

75. The participation rate of males aged 16 years and over declined from 86.8 per cent in 1947 to 79.7 per cent in 1972 (see p. 261 above).
population aged 16 years and over. This variable is denoted \( L_p \).

The independent variables in this model are \( W_M, W_R, M \) and \( T \) where \( W_M \) is the real wage rate in manufacturing, \( W_R \) is the real wage rate in retail trade, \( M \) is some index of marketing and \( T \) is time.

The variable \( W_M \) is used as a proxy for the income of the household. Both theoretical analysis and empirical tests suggest that the income of the household has a negative effect on the participation rate of female workers.\(^{76}\) In existing empirical studies of the participation rate of married women, the most common variable used as a proxy for the income of the household is the income of the husband.\(^{77}\) Since time-series data on husband's income is not available, in the present study, the real wage rate in manufacturing is used as a proxy for the income of the household.

The variable \( W_R \) is used as a proxy for the real rate of remuneration of female workers. There are no time-series data available on female wage rates. However, since female workers tend to dominate the retail trade sector, \( W_R \) is a reasonable proxy for the rate of remuneration of female workers.

Possible Econometric Problems.

Econometric problems which are likely to be associated with a study of this nature are those associated with the small number of observations, single-equation bias, autocorrelation and multicollinearity.

\(^{76}\) See Bowen and Finegan, *op.cit.*, p.240.

\(^{77}\) See for example, Mincer, *op.cit.*, p.69.
Number of Observations.

The time-period covered is 1947-72 inclusive.\textsuperscript{78} Since annual data is used there are 26 observations.\textsuperscript{79} Although the number of observations is relatively small, the period covers enough complete business cycles for us to be able to discern the underlying trend relationship between aggregate labour supply and marketing in the post-war period.

Single-Equation Bias.

The only possible source of single-equation bias in the present study is that between the labour supply and the real wage rate. The other variables, \(N, M\) and \(T\), are clearly exogenous in the labour supply model. With regards to possible simultaneity bias between the labour supply and the real wage rate, this will be minimal if wage rates are determined primarily by cost push factors rather than the demand for labour.\textsuperscript{80}

Autocorrelation.

The problem of autocorrelation, as indicated by the Durbin Watson test, varies according to the model used. In models using

\textsuperscript{78} 1947-71 inclusive, in a few cases.

\textsuperscript{79} Besides the fact that quarterly data on marketing indices are not available, one advantage of using annual data in the present study is that it allows a sufficient period for adjustment and therefore obviates the need to specify and experiment with appropriate lags.

and $L_N$ as dependent variables there was no indication of autocorrelated residuals except for one equation. This equation was re-estimated using the Hildreth-Lu transformation of the variables to purge the results of autocorrelation.

The models using average hours as the dependent variable did indicate autocorrelation. These equations were therefore re-estimated using the Hildreth-Lu procedure. Only the re-estimated results are shown in table 5.3.

Most of the equations in the model with $L_p$ as the dependent variable also indicated autocorrelated residuals. In this case, however, re-estimation with the Hildreth-Lu procedure improved the DW values obtained but only sufficiently to produce DW values which were in the indeterminate range.

**Multicollinearity.**

In the basic models $L = f(W, N, M)$ and $L_H = f(W, M)$ where $L$ = labour supply and $L_H$ is average hours, multicollinearity is not a serious problem. All the coefficient estimates in these equations are significant and the coefficient estimates are not sensitive to model changes associated with changes in the index of marketing. However, once a time trend variable is included in these models, the coefficient estimate of $W$ becomes extremely sensitive to model changes and insignificant. The results clearly indicate that it is not possible to separate the effects of $W$ and $L$.

---

81. Multicollinearity increases the standard errors of the coefficients and coefficient estimates are sensitive to small changes in sample data (see Johnston, *op.cit.*, p.160).
T because of the high correlation between these two variables. The results also clearly indicate that the marketing variable \( M \) is not simply picking up the effect of the time trend.

In the basic model \( L_p = f(W_M, W_R, M) \) where \( L_p \) is the female participation rate, there are problems of multicollinearity in addition to the problem of autocorrelation mentioned previously. The results of this model are therefore much less satisfactory than the results of the total labour supply and average hours models. The multicollinearity problem in the participation rate model is due not only to the high correlation between \( W_M \) and \( T \) but also to the high correlation between \( W_M \) and \( W_R \).

Summary List of Variables Used in All Estimating Equations.

- \( L \) = Aggregate labour supply of all non-agricultural workers, measured in man-hours.
- \( L_M \) = Aggregate labour supply of all non-agricultural workers as measured by average weekly hours in manufacturing.

\[ r^2 \text{ between } W \text{ and } T \text{ is } 0.996 \text{ and between } W_M \text{ and } T \text{ is } 0.995 \text{ in equation 5a, where the variables are transformed, } r^2 \text{ between } W \text{ and } T \text{ reduces to } 0.97. \text{ All of the other independent variables are less correlated with each other.} \]

\[ M \text{ is significant whether } T \text{ is included or excluded from the model. See discussion of empirical results in the next section.} \]

\[ r^2 \text{ between } W_M \text{ and } W_R \text{ is } 0.985. \text{ However, the actual } r^2 \text{ value will differ in each equation where the Hildreth-Lu transformation is used.} \]

\[ \text{All data and data sources are given in Appendix C.} \]
\[ L_H \] = Average weekly hours worked by all non-agricultural workers.

\[ L_{HM} \] = Average weekly hours worked by all manufacturing workers.

\[ L_P \] = Female participation rate.

\[ W \] = Average hourly wage rate of all non-agricultural workers.

\[ W_M \] = Average hourly wage rate of all manufacturing workers.

\[ W_R \] = Average hourly wage rate of all workers in the retail trade sector.

\[ N \] = Total non-institutional population aged 16 years and over.

\[ T \] = Time trend defined as 1, 2, ..., \( t \), where \( t \) = total number of observations.

\[ M_e \] = Total marketing expenditures defined as the sum of advertising expenditures, expenditures on industrial research and development and 15 per cent of consumer credit balances outstanding.

\[ A \] = Advertising expenditures.

\[ M_{ARR&D} \] = Principal components index of marketing based on the original variables, advertising expenditures, consumer credit balances outstanding and expenditures on industrial research and development.

\[ M_{ART} \] = Principal components index based on the original variables advertising expenditures, consumer credit balances outstanding and total trademarks issued including renewals.

5.7 THE EMPIRICAL RESULTS.

The empirical results are presented in table 5.3. For each equation, table 5.3 provides the coefficient estimates and their respective \( t \)-values, the coefficient of multiple determination adjusted for degrees of freedom and the Durbin-Watson statistic.

The results of the primary model, i.e., the model with labour supply as the dependent variable, clearly support the hypothesis that marketing has a significant positive effect on the aggregate supply of labour. The coefficient for \( M \) is positive and signifi-
cant at the .05 level in all equations of this model.

The results of the average hours model support the hypothesis that marketing increases average weekly hours supplied. The marketing variable is also positive and significant at the .05 level in all equations of this model. The results of this model are therefore consistent with the basic hypothesis that marketing increases the aggregate supply of labour.

The results of the female participation rate model are less satisfactory. Only in two of the four equations listed in table 5.3 is the marketing variable significant. In both of these equations, the values for the DW statistic does not allow us to reject the hypothesis of positive autocorrelation. More detailed discussions on the results of each model are presented below.

**Model 1.**

The equations corresponding to model 1 are 1, 1a, 1b and 1c. These equations present the results for the complete model \( L = f(W, N, M, T) \) using four different indices of marketing. All four indices show the marketing variable to be positive and significant at the .05 level. The index which gave the smallest t-value for \( M \) was advertising expenditures. The equation using this index – equation 1a – also had to be estimated using the Hildreth-Lu procedure since the DW value obtained with the original data was in the indeterminate region. The DW values for the other three equations indicated absence of autocorrelation. The positive and significant coefficients for the indices of marketing support the hypothesis put forward in this thesis that marketing shifts out the instantaneous supply curve over time thereby
reducing the demand for leisure.

The control variable N is also positive and significant in all four equations of this model. This indicates that the marketing variable is not simply proxying for population growth.

A priori, we would expect the coefficient of W to be negative and significant. This is based on the assumption that the income effect dominates the substitution effect at high wage rates. On this assumption a one-tailed test is appropriate and the critical t-value is -1.72. This means that only equation 1c. of model 1 shows W to be negative and significant at the .05 level. The only plausible explanation which is indicated by the results is that the inclusion of the time trend variable makes it impossible to separate out the effect of W and T on L. In the first place W and T are highly correlated. Secondly, if as the results indicate, N is controlling for population increase, and M takes care of outward shifts in L, in the absence of any other effect on L, T must be picking up the negative income effect. This is clearly supported by the negative and significant coefficients obtained for T in the three equations in which W is insignificant.

86. See p. 306, n. 82 above.

87. Prior to obtaining the empirical results, there is no a priori reason why the coefficient of T should be positive or negative. On this reasoning the appropriate test for T is a two-tailed test. Since the critical t-value for a two-tailed test is -2.08, T is significant only for equations 1 and 1b. However, if after the empirical results, T is assumed to be proxying for W, a one-tailed test can be justified.
Model 2.

Model 2 consists of equations 2, 2a, 2b and 2c. This model is identical to model 1 except that the dependent variable is $L_M$ and $W_M$ is wage rate variable instead of $W$.

The results are only marginally different from those of model 1. $M$ is positive and significant in all four equations. However, the t-values are larger in every case. This tends to support our \textit{a priori} hypothesis that average hours worked in manufacturing is a better indication of the trend of average hours in the post-war period than average hours in all non-agricultural establishments.

There is no indication of autocorrelation. $N$ is positive and significant in all four equations. $R^2$ values are similar to those of model 1.\footnote{Except for equation 1a, where the variables were transformed by the Hildreth-Lu procedure.}

The variable $W_M$ is negative and significant in none of the equations of model 2. The time trend variable, on the other hand, is negative and significant in three of the four equations. As in model 1, the only plausible explanation is that it is not possible to separate out the effect of $W_M$ and $T$.

Model 3.

Model 3 consists of equations 3, 3a and 3b. In this model the dependent variable is the same as in models 1 and 2, but the time
trend variable is omitted. In equations 3 and 3a the dependent variable is \( L_M \), and \( W_M \) is the corresponding wage rate variable.

Compare the results of equation 3 with those of equation 2a. The index of marketing in both cases is \( A \). The t-value for \( A \) falls somewhat when \( T \) is omitted from the equation. However, \( A \) is significant in both equations. The same is true of the variable \( N \). \( R^2 \) is about the same in both equations. DW indicates no autocorrelation in both cases. However, the significant change is in the variable \( W_M \). From being positive and insignificant in equation 2a it becomes negative and significant in equation 3. This confirms our previous explanation that the time trend variable is picking up the negative income effect.\(^8^9\)

If we compare equations 3a and 2c we see the same pattern. However, in this case the t-value for \( W \) increases somewhat when \( T \) is omitted from the equation. \( W_M \) is negative but not significant in equation 2c. It becomes significant when \( T \) is omitted.

In equation 3b the dependent variable is \( L \) and the corresponding wage rate variable is \( W \). Compare equation 3b with equation 1c where the same index of marketing is used. The t-value for \( M \) falls somewhat but remains significant when \( T \) is omitted from the equation. \( N \) is significant in both cases. \( R^2 \) is identical. DW indicates no autocorrelation in both cases. In equation 1c. \( W \) has the expected sign and is significant while \( T \) is positive though insignificant. The omission of \( T \) in equation 3b causes a

\(^8^9\) It also confirms the classical hypothesis of an instantaneous backward bending supply curve of labour.
slight drop in the t-value of \( W \), though it remains negative and significant.

Model 4.

The equations of model 4 are 4, 4a, 4b, 4c, 4d and 4e. The dependent variable is \( L_H \) - average weekly hours for non-agricultural workers -, the wage rate variable is \( W \), and the control variable \( N \) is omitted. In equations 4, 4a and 4b the time variable is included. In equations 4c, 4d and 4e the time variable is excluded. All equations of this model had to be re-estimated using the Hildreth-Lu procedure to purge the results of autocorrelation. Only the re-estimated results are shown.

All three indices of marketing, \( M_e \), A and \( M_{ARR&D} \), are positive and significant in all six equations of this model. Clearly the \( M \) variable is not proxying for the time trend variable.

In equations 4, 4a and 4b both \( W \) and \( T \) are negative. However, neither is significant in any equation.\(^9^0\) As expected, when \( T \) is excluded in equations 4c, 4d and 4e, \( W \) is significant in every case.

Model 5.

The equations are 5, 5a, 5b and 5c. The dependent variable is average weekly hours in manufacturing. The wage rate variable is \( W_M \). \( T \) is included in equations 5 and 5a and excluded from equations 5b and 5c.

\( M \) is positive and significant in all four equations. \( W \) is

\(^{90}\) Using a two-tailed test for \( T \).
### TABLE 5.3

Estimates Of Parameters For The Labour Supply Function.

<table>
<thead>
<tr>
<th>Model/Dependent</th>
<th>Dependent</th>
<th>Index of Marketing</th>
<th>Method of Estimation</th>
<th>Constant</th>
<th>Coefficient of $W_a^1$</th>
<th>Coefficient of $W_M^1$</th>
<th>Coefficient of $N_a^2$</th>
<th>Coefficient of $W_R^3$</th>
<th>Coefficient of $M_a^3$</th>
<th>Coefficient of $T_a^4$</th>
<th>$R/DW$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. L $M_e$</td>
<td>OLS</td>
<td>-267 (-0.94)</td>
<td>287 (1.50)</td>
<td></td>
<td>21.2 (9.1)*</td>
<td>-</td>
<td>-</td>
<td>7.5 (2.5)*</td>
<td>28.1 (-2.8)*</td>
<td>0.994</td>
<td>1.86</td>
</tr>
<tr>
<td>1a. L A</td>
<td>OLS (H-LU_{oo})</td>
<td>-245 (-0.75)</td>
<td>73.7 (0.31)</td>
<td>-</td>
<td>23.6 (6.9)*</td>
<td>-</td>
<td>-</td>
<td>18.8 (1.73)*</td>
<td>-18.4 (-2.0)</td>
<td>0.989</td>
<td>1.91</td>
</tr>
<tr>
<td>1b. L $M_{ARR&amp;D}$</td>
<td>OLS</td>
<td>-52.2 (-0.20)</td>
<td>253 (1.32)</td>
<td>-</td>
<td>21.6 (9.1)*</td>
<td>-</td>
<td>-</td>
<td>83.9 (2.4)*</td>
<td>-26.8 (-2.7)*</td>
<td>0.994</td>
<td>1.84</td>
</tr>
<tr>
<td>1c. L $M_{ART}$</td>
<td>OLS</td>
<td>1330 (2.8)*</td>
<td>-510 (-1.85)*</td>
<td>-</td>
<td>18.3 (8.0)*</td>
<td>-</td>
<td>-</td>
<td>70.1 (3.0)*</td>
<td>14.2 (1.32)</td>
<td>0.994</td>
<td>2.12</td>
</tr>
<tr>
<td>2. LM $M_e$</td>
<td>OLS</td>
<td>-2222 (-3.6)*</td>
<td>-470 (1.90)*</td>
<td>36.8 (11)*</td>
<td>-</td>
<td>14.1 (3.2)*</td>
<td>-61.0 (3.6)*</td>
<td>0.993</td>
<td>2.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2a. LM A</td>
<td>OLS</td>
<td>-1747 (-2.9)*</td>
<td>-53.8 (0.20)</td>
<td>37.3 (11)*</td>
<td>-</td>
<td>42.1 (3.0)*</td>
<td>-38.5 (2.6)*</td>
<td>0.993</td>
<td>2.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2b. LM $M_{ARR&amp;D}$</td>
<td>OLS</td>
<td>-1772 (-3.0)*</td>
<td>-422 (1.73)*</td>
<td>37.1 (11)*</td>
<td>-</td>
<td>167 (3.3)*</td>
<td>-57.7 (3.6)*</td>
<td>0.993</td>
<td>2.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2c. LM $M_{ART}$</td>
<td>OLS</td>
<td>1321 (1.0)</td>
<td>-548 (-1.23)</td>
<td>20.0 (3.1)*</td>
<td>-</td>
<td>109 (3.05)*</td>
<td>18.5 (0.71)</td>
<td>0.991</td>
<td>2.38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See notes at end of table.
<table>
<thead>
<tr>
<th>Model/Equation</th>
<th>Dependent Variable</th>
<th>Index of Marketing (1)</th>
<th>Method of Estimation (2)</th>
<th>Constant (3)</th>
<th>Coefficient of W (a0/a1)</th>
<th>Coefficient of WM (a1)</th>
<th>Coefficient of N (a2)</th>
<th>Coefficient of WR (a2)</th>
<th>Coefficient of M (a3)</th>
<th>Coefficient of T (a4)</th>
<th>R/DW (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Lm</td>
<td>A</td>
<td>OLS</td>
<td>-181 (-1.21)</td>
<td>-</td>
<td>-501 (-2.6)*</td>
<td>30.6 (11)*</td>
<td>-</td>
<td>35.3 (2.3)*</td>
<td>-</td>
<td>0.991</td>
</tr>
<tr>
<td>3a.</td>
<td>Lm</td>
<td>M_Art</td>
<td>OLS</td>
<td>404 (1.6)</td>
<td>-</td>
<td>-241 (-2.3)*</td>
<td>24.2 (9.0)*</td>
<td>-</td>
<td>94.9 (3.2)*</td>
<td>-</td>
<td>0.991</td>
</tr>
<tr>
<td>3b.</td>
<td>L</td>
<td>M_Art</td>
<td>OLS</td>
<td>748 (4.6)*</td>
<td>-170 (-1.73)*</td>
<td>-</td>
<td>19.0 (8.4)*</td>
<td>-</td>
<td>53.8 (2.7)*</td>
<td>-</td>
<td>0.994</td>
</tr>
<tr>
<td>4.</td>
<td>Lh</td>
<td>M_e</td>
<td>OLS</td>
<td>41.7 (12)*</td>
<td>-1.87 (-0.75)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.15 (3.3)*</td>
<td>-0.26 (-2.0)</td>
<td>0.993</td>
</tr>
<tr>
<td>4a.</td>
<td>Lh</td>
<td>A</td>
<td>OLS</td>
<td>43.9 (13)*</td>
<td>-4.3 (-1.71)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.44 (3.7)*</td>
<td>-0.093 (-0.84)</td>
<td>0.993</td>
</tr>
<tr>
<td>4b.</td>
<td>Lh</td>
<td>M_Arr&amp;D</td>
<td>OLS</td>
<td>46.5 (13)*</td>
<td>-2.2 (-0.88)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.80 (3.5)*</td>
<td>-0.25 (-1.97)</td>
<td>0.993</td>
</tr>
<tr>
<td>4c.</td>
<td>Lh</td>
<td>M_e</td>
<td>OLS</td>
<td>47.8 (31)*</td>
<td>-5.9 (-4.6)*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.10 (2.67)*</td>
<td>-</td>
<td>0.989</td>
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<tr>
<td>4d.</td>
<td>Lh</td>
<td>A</td>
<td>OLS</td>
<td>46.6 (56)*</td>
<td>-6.1 (-6.1)*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.41 (3.7)*</td>
<td>-</td>
<td>0.991</td>
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</table>

See notes at end of table.
<table>
<thead>
<tr>
<th>Model/Equation</th>
<th>Dependent Variable</th>
<th>Index of Marketing (1)</th>
<th>Method of Estimation (2)</th>
<th>Constant $a_0$ (3)</th>
<th>Coefficient of $W$ $a_1$</th>
<th>Coefficient of $W_M$ $a_2$</th>
<th>Coefficient of $N$ $a_2$</th>
<th>Coefficient of $M$ $a_3$</th>
<th>Coefficient of $T$ $a_4$</th>
<th>$R/DW$</th>
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<tbody>
<tr>
<td>4e.</td>
<td>L$_H$ (contd.)</td>
<td>M$_{MARK&amp;D}$</td>
<td>OLS (H-LU$_{oo}$)</td>
<td>51.1 (20)*</td>
<td>-6.1 (-4.8)*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.26 (2.9)*</td>
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<tr>
<td>5.</td>
<td>L$_{HM}$</td>
<td>M$_e$</td>
<td>OLS (H-LU$_{oo}$)</td>
<td>36.2 (5.4)*</td>
<td>1.17 (0.27)</td>
<td>-</td>
<td>-</td>
<td>0.24 (2.85)*</td>
<td>-0.40 (-1.88)</td>
<td>0.961</td>
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<tr>
<td>5a.</td>
<td>L$_{HM}$</td>
<td>A</td>
<td>OLS (H-LU$_{oo}$)</td>
<td>46.7 (7.1)*</td>
<td>-7.0 (-1.53)</td>
<td>-</td>
<td>0.75 (3.3)*</td>
<td>-</td>
<td>-0.036 (0.20)</td>
<td>0.880</td>
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<tr>
<td>5b.</td>
<td>L$_{HM}$</td>
<td>M$_e$</td>
<td>OLS (H-LU$_{oo}$)</td>
<td>43.8 (15)*</td>
<td>-5.2 (-2.2)*</td>
<td>-</td>
<td>0.17 (2.35)*</td>
<td>-</td>
<td>-0.902 (1.91)</td>
<td>1.91</td>
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<tr>
<td>5c.</td>
<td>L$_{HM}$</td>
<td>A</td>
<td>OLS (H-LU$_{oo}$)</td>
<td>45.5 (23)*</td>
<td>-6.2 (-3.1)*</td>
<td>-</td>
<td>0.75 (3.3)*</td>
<td>-</td>
<td>-0.912 (1.89)</td>
<td>1.89</td>
</tr>
<tr>
<td>6.</td>
<td>L$_p$</td>
<td>M$_{ART}$</td>
<td>OLS</td>
<td>31.1 (2.4)*</td>
<td>-2.6 (-0.53)</td>
<td>-</td>
<td>6.5 (1.1)</td>
<td>1.2 (1.9)*</td>
<td>0.18 (0.56)</td>
<td>0.980</td>
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</tr>
<tr>
<td>6a.</td>
<td>L$_p$</td>
<td>A</td>
<td>OLS (H-LU$_{oo}$)</td>
<td>32.7 (4.1)*</td>
<td>-1.87 (-0.34)</td>
<td>-</td>
<td>0.91 (0.17)</td>
<td>0.12 (0.46)</td>
<td>0.47 (2.01)</td>
<td>0.969</td>
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</tr>
<tr>
<td>6b.</td>
<td>L$_p$</td>
<td>M$_{ART}$</td>
<td>OLS</td>
<td>24.1 (8.0)*</td>
<td>-0.14 (-0.06)</td>
<td>-</td>
<td>9.2 (2.8)*</td>
<td>1.01 (1.9)*</td>
<td>-</td>
<td>0.980</td>
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</table>

See notes at end of table.
TABLE 5.3
Estimates Of Parameters For The Labour Supply Function. (continued)

<table>
<thead>
<tr>
<th>Model/ Equation</th>
<th>Dependent Variable</th>
<th>Index of Marketing (1)</th>
<th>Method of Estimation (2)</th>
<th>Constant ( a_0 ) (3)</th>
<th>Coefficient of ( \tilde{M} ) ( a_1 )</th>
<th>Coefficient of ( \tilde{N} ) ( a_2 )</th>
<th>Coefficient of ( \tilde{W} ) ( a_3 )</th>
<th>Coefficient of ( \tilde{T} ) ( a_4 )</th>
<th>( R/DW )</th>
</tr>
</thead>
<tbody>
<tr>
<td>6c. Lp</td>
<td>(contd.)</td>
<td>A</td>
<td>OLS (H-LU(_{00}))</td>
<td>33.4 (4.6)*</td>
<td>-1.75 (-0.34)</td>
<td>-</td>
<td>0.13 (0.49)</td>
<td>0.50 (2.6)*</td>
<td>0.970</td>
</tr>
</tbody>
</table>

Notes: (1) Where a principal components index of marketing is used the subscripts following \( \tilde{M} \) indicates the original variables used in obtaining the principal components. For example, \( M_{\text{ART}} \) indicates that the original variables are advertising expenditures, consumer credit balances outstanding and total trademarks issued including renewals. The number in parenthesis indicates the percentage of variation which is explained by the first principal component.

(2) H-LU\(_{00}\) indicates that the original variables were transformed in an attempt to purge the OLS results of autocorrelation. The method used was the Hildreth-Lu procedure. The oo subscript indicates that the modified Hildreth-Lu procedure was used (see Massager's 73, p.4-67-75). The modified procedure generally gave better results than the unmodified procedure. More importantly, the unmodified procedure produces a substantial reduction in \( R^2 \).

(3) \( t \)-values are given in parenthesis. The * following the \( t \)-value indicates that the coefficient is significant at the .05 level.

(4) The first value is the coefficient of determination adjusted for degrees of freedom. The second value is the Durbin Watson statistic. The * following the DW statistic indicates that DW is in the indeterminate range.
negative and significant only in equations 5b and 5c where T is excluded. The results with average hours in manufacturing is not significantly different from the results with average hours in all non-agricultural establishments. Both sets of results provide additional support for the basic hypothesis that marketing shifts out the aggregate labour supply curve over time.

Model 6.

This model consists of equations 6, 6a, 6b and 6c. The dependent variable is the female participation rate. The complete model is \[ L_p = f(W_M, W_R, M, T). \] The results of the complete model are shown in equation 6. *A priori*, we would expect household income to have a negative effect on the female participation rate, and its rate of remuneration to have a positive effect.\(^91\) Thus we expect the sign of \( W_M \) to be negative and the sign of \( W_R \) to be positive.

The variables \( W_M, W_R \) and \( M \) have the expected signs. However, only the marketing variable is significant. Multicollinearity is a serious problem in this model due to the high correlations between \( W_M \) and \( T \), \( W_R \) and \( T \) and \( W_M \) and \( W_R \).\(^92\) The DW value in equa-

91. The decision as to how many people are to participate in the labour force is a household decision. This decision will be related to the net advantage of participating. An increase in female wage rates will exert a pull effect into the labour force for females in the household. An increase in the income of the household will have the opposite effect. See Bowen and Finegan, *op.cit.*, p.240 and J.T. Montague and J. Vanderkamp, *A Study in Labour Market Adjustment* (Institute of Industrial Relations, University of British Columbia, June 1966), p.25.

92. See p.306, n.82 and n.84 above.
tion 6 also indicates positive autocorrelation.

In equation 6a, the index of marketing is advertising expenditures and the Hildreth-Lu procedure is used to attempt to purge the results of autocorrelation. However, the DW value is still in the indeterminate range. The results are also poorer. The marketing variable is positive but insignificant. $W_M$ and $W_R$ maintain the correct signs, but become even less significant. The only variable which increases its significance is $T$.

In equation 6b, $T$ is omitted. The marketing index is the same as in equation 6. $M$ is again positive and significant. The DW value improves but is still in the indeterminate range. The significant improvement is in the coefficient for $W_R$. This is now positive and significant. The coefficient of $W_M$ remains negative and insignificant.

In equation 6c, $T$ is reintroduced, but $W_R$ is now omitted. However, the results do not improve compared with equation 6a. The $t$-value for $M$ increases, but $M$ is still insignificant. The $t$-value for $W_M$ remains unchanged. DW remains in the indeterminate range. The $t$-value for $T$ increases so that $T$ is now significant even with a two-tailed test.

The results of this model clearly do not contradict the basic hypothesis that marketing leads to an outward shift in the aggregate labour supply curve. However, the results are not as favour-

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93 Other indices of marketing were tried and both the modified and unmodified Hildreth-Lu procedure used. But in all cases, DW remained in the indeterminate range.
able as those obtained in the other models. These weaker results seem to be due more to the problems of autocorrelation and multicollinearity associated with the sample data than to a weaker effect of marketing on participation rates compared to average hours. The implication, therefore, is that a different set of sample data, if available, should be experimented with.
In part II of chapter 3, the dynamic nature of marketing was
analysed within the framework of the Harrod-Domar growth model.
In that chapter two reasons were given for treating marketing as
a dynamic variable. The first is that marketing expenditures
show a trend increase over time. The second reason, and the one
which is more relevant in the present context, is that marketing
adds to the capacity of the economy thereby requiring continuous
increases in income and aggregate demand to maintain full em-
ployment. As suggested in chapter 3, there are two ways in which
marketing adds to the capacity of the economy. The first is by
inducing a direct increase in the man-hours of labour supplied.
The second is by inducing labour to force up money wage rates via
the quit and search mechanism. This, in turn, leads to three
sources of productivity increase.¹

The hypothesis that marketing leads to an increase in the
capacity of the economy through an increase in the labour supply,
measured in man-hours, is a directly testable hypothesis. An
empirical test of this hypothesis was therefore provided in the
previous chapter. However, the relationship between marketing
and productivity increases is not directly testable. An indirect
test of this relationship can be provided by testing the prior
hypothesis that marketing induces labour to force up money wage

¹. These sources of productivity increase are an increase in the
capital/labour ratio, technological progress embodied in ca-
pital and technological progress embodied in labour. See
chapter 3.
rates. Irrespective of the conclusion that can be drawn about the relationship between marketing and productivity increases, the results from testing the prior hypothesis between marketing and the change in money wage rates is itself interesting in that it helps us to understand the wage determination process. This chapter therefore provides a test of the relationship between marketing and the change in money wage rates within the framework of the Phillips curve model.

6.1 INTRODUCTION AND REVIEW.

Most existing models of wage determination are single equation models although some of the more recent works have experimented with simultaneous equation models. The concentration on single equation models has meant that researchers have been able to experiment with a large number of variables, functional forms, lags and sample periods.

Variables Included in Existing Wage Determination Models.

Wage determination models date back to the work of Phillips.

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Phillips found an empirical relationship between the level of unemployment and the rate of change of money wage rates. A theoretical rationale for this relationship is provided from the purely competitive model. In the latter model labour is treated as any other commodity. Hence, its price is determined by supply and demand. In equilibrium there is no change in the wage rate. If there is excess demand, the wage rate changes. In the competitive model unemployment can be regarded as a measure of excess demand in the labour market.  

Both theoretically and empirically, therefore, unemployment suggests itself as a variable in the wage determination model.  

The earliest studies of the wage adjustment relationship both in Britain and the United States concentrated exclusively on unemploy-

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4. "The basic and largely unquestioned dynamic hypothesis underlying Phillips curve research is that the rate of change of money wages is proportional to the magnitude of the disequilibrium in the labour market, defined as the rate of excess demand... In the absence of a pure measure of the rate of excess demand, a proxy variable was required, and the unemployment rate was selected by Phillips and used in most subsequent research under the assumption that it moved parallel to the true but unmeasurable rate of excess demand." Robert Joseph Flanagan, "A Study of International Differences in Phillips Curves," Unpublished Ph.D. thesis (University of California, Berkeley, 1970), pp.1-6.

5. The unemployment variable has additional appeal from a policy point of view since it suggests a trade-off between two policy goals - price stability and unemployment.
ment as the explanatory variable. Attention was focused at this time on the possible trade-off between price stability and unemployment as described by the Phillips curve relation. An important difference between the relationship fitted for Britain by Phillips and the relationship fitted by Samuelson and Solow for the United States, was recognised at this time. While the same curve tended to fit both the pre-World War II and post-World War II British data, the Samuelson Solow study showed that the American curve had shifted upwards in the post-war period.

Adjustment for Changes in the Cost of Living.

The basic Phillips curve relationship can be regarded either as a ceteris paribus relationship, i.e., all other factors are being held constant, or as a relationship in which nothing else but the level of unemployment matters. Both economic theory, and empirical work subsequent to that of Phillips, suggest that the Phillips curve is best regarded as a short-run or ceteris paribus relationship which shifts when other relevant variables change.

The cost of living is perhaps the most obvious factor which

6. The earliest studies refer to Phillips study for the United Kingdom - op.cit., and the Samuelson/Solow study for the United States - P.A. Samuelson and R.M. Solow, "Analytical Aspects of Anti-Inflation Policy," American Economic Review, Vol. 50 (May 1960), pp.177-194. Several earlier studies were done in the United States prior to the work of Phillips. However, most of these earlier studies were done within the framework of a more generalized econometric model. For references see Bodkin, op.cit., pp.26-30 and Bodkin, et al., op.cit., p.38.

7. Observed shifts in the "simple" Phillips curve relation provides an empirical justification for introducing new "shift" variables into the simple relationship. However, the choice of appropriate shift variables to be included in the empirical model must be based on theoretical considerations.

Non-Competitive Behaviour in Labour Markets.

A model of wage determination which ignores non-competitive and institutional factors in labour markets is unrealistic. Non-competitive behaviour relate to the existence of cost push factors, and oligopolistic product markets. Institutional factors relate to mechanisms through which labour is able to make cost push demands effective such as trade unions, government legislation, cost of information and the "quit and search" process. The whole process is rather complex and interconnected and it becomes difficult, if not impossible, to distinguish between cost push, institutional and demand pull factors in the wage determination process. For example, it is known that trade unions push harder for
money wage increases when there is high excess demand for labour and when the cost of living is increasing.\(^9\)

Wage determination models have attempted to incorporate non-competitive behaviour in labour markets by adding variables other than unemployment and price change in their models. Two of the more common variables which have been added are profits and degree of unionization.

**Addition of a Profit Variable.**

Profits as an explanatory variable has been introduced in several of the American studies of the wage adjustment function. The most prominent study incorporating the profits variable is that of G.L. Perry.\(^{10}\) The profits variable used by Perry was after-tax profits as a percentage of stockholders' equity. This profits

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9. Similarly, the "quit and search" mechanism operates best under conditions of relatively full employment.

variable was found to be significant in Perry's study.\textsuperscript{11} As Perry \textit{(op.cit., 1966, p.27)} noted, some writers go so far as to explain the change in wages exclusively in terms of profits. One of these writers is Kaldor.\textsuperscript{12} Kaldor's theory is based on the idea that since wages are set by collective bargaining, wage rates depend on the relative strengths of labour and management. If there was a large increase in profits over the previous period, this increases the bargaining strength of unions relative to management in the current period. Hence, wages are determined by profits lagged one period.

The inclusion of a profits variable can be justified from two other points of view. The first is that profits is a measure of the firm's ability to meet demands for wage increases. Secondly, profits is an index of how much management has to lose from a strike if wage demands are not met.


While Kaldor argues that any observed correlation between unemployment and change in money wage rates is due to correlation between unemployment and profits, others have argued that the profits variable might be proxying for other institutional factors in the labour market. One of these institutional factors for which the profits variable might be proxying is the degree of unionization.

**Degree of Unionization as an Explanatory Variable.**

In an attempt to evaluate the relative importance of cost push and demand pull factors on the inflation rate, Hines, *op.cit.*, attempted to test the hypothesis that changes in the money wage rate were directly related to trade union militancy. Hines argued that when unions assume an aggressive or militant attitude in the wage bargaining process, they attempt to strengthen their bargaining position by increasing their membership. Hines therefore used the rate of change of trade union membership as the index of trade union militancy. He found this variable to be significant and the unemployment variable to be insignificant. Hence his conclusion that the post-war British inflation was due primarily to cost push than to demand pull factors.

Several criticisms have been levied against Hines work. The most important criticism is that there is no appropriate index of
trade union power. Another criticism is that it is not possible to separate cost push and demand pull factors in explaining inflation.

Degree of unionization as an explanatory variable in the wage determination function has been experimented with primarily in Britain. Profits, on the other hand, as an explanatory variable has been experimented with primarily in North America. In the Economic Council of Canada study by Bodkin, et al., a possible reconciliation was suggested:

"Hines' results also suggest that profits are one determinant, with a lag, of the change in unionization. In turn, this suggests that one interpretation of the importance of a profits variable in a wage adjustment relationship, which has been found by Perry (reference below) and the present study, might be that this variable serves as a partial indicator of trade union pushfulness. (op.cit.,


14. See for example, Dicks-Mireaux and Dow, op.cit.

15. See references above.
Several existing studies of the Phillips curve relationship have included both the level of unemployment and the change in unemployment. The change in unemployment as an explanatory variable was suggested by Phillips, *op.cit.*, and tested by Lipsey, *op.cit.* While Lipsey found that this variable was statistically significant throughout the period of his study, its coefficient changed sign from negative in the nineteenth century to positive in the twentieth century.

Lipsey offered a theoretical explanation for the observed relationship between the change in the money wage rate, $\Delta W$, and the change in the unemployment rate, $\Delta U$, which has since been rejected by later writers. \(^{16}\) Bowen and Berry, \(^{17}\) using American data, also found a significant relationship between $\Delta W$ and $\Delta U$. The latter authors offered an alternative theoretical explanation which is now widely accepted. Bowen and Berry suggested that $\Delta U$ is an index of future labour market conditions. If employers expect the labour market to become more tight in the future they are more willing to grant wage increases than if they expect the opposite. $\Delta U$ is therefore used as a proxy for the state of expectations.

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\(^{16}\) Lipsey suggested that the observed relationship was due to aggregation rather than an underlying structural relation. If the unemployment rate varies between sectors of the economy, and the wage adjustment function is highly non-linear, cyclical variation in economic activity would lead us to observe an aggregate relationship between $\Delta W$ and $\Delta U$. See Lipsey, *op.cit.*

The studies by Perry (op.cit., 1964 and 1966) used both the level of profits, and the change in profits, as variables. In his 1966 study, Perry suggested that his change in profits variable can be interpreted in the same way as ΔU.

Up to now, the level of two important variables, profit rate and unemployment, has been discussed. But wage changes may also be influenced by the direction in which these variables are moving. The main reason for using directions or rates of change as explanatory variables is that they represent a basis for prediction. For instance, if falling profits lead to expectations of still lower levels, and if this expectation affects wage bargaining, then the change in profits ought to be included as an explanatory variable. (Perry, 1966, p.29).

Perry also suggested that there is no a priori reason for choosing between ΔU and the change in profits, as an index for the state of expectations.

Data, Time Periods, Lags and Functional Forms.

The wage data used in American studies is average hourly earn-
ings in the manufacturing sector. Functions have been tested using annual, quarterly and monthly data. The wage and price variables have been specified as absolute changes and as percentage changes. Most of the American studies cover both the pre-World War II and post-World War II periods.

The studies using annual data do not specify any explicit lags. However, since the dependent variable is specified as a change, there is often an implicit lag between the dependent variable and

18. British studies use wage rates. Average hourly earnings are higher than wage rates because overtime rates are higher than regular rates. Average hourly earnings also tend to be more volatile - see Bodkin, et al, op.cit., p.46. The use of average hourly earnings has been criticized in a recent study by J.C.R. Rowley and D.A. Wilton, "Empirical Foundations for the Canadian Phillips Curve," Canadian Journal of Economics, Vol.7, No. 2 (May 1974), pp.251-252. However, the theoretical foundations of Rowley and Wilton's criticism seem extremely weak. In a previous study of the Phillips Curve, McCaffree noted that, "I believe the confidence in wage rates to be misplaced. The more inclusive measure of wage payment is, theoretically at least, the more appropriate. In the first place, the issue goes to the heart of that to which workers and employers respond in the market. Do individuals take work, choose leisure, or face unemployment by reason of wage-rate changes alone? Or is the total compensation relevant? Similarly, are firms responding only to wage rates or to total costs? Put in this fashion, the implications seem clear that unemployment will affect the rate of change of total compensation directly than wage rates alone." K.E. McCaffree, "A Further Consideration of Wages, Unemployment, and Prices in the United States, 1948-1955," Industrial and Labor Relations Review, Vol. 17 (Oct. 1963), pp.64-65.
some of the independent variables.\textsuperscript{19}

The functional form is generally assumed to be linear. However, the original functions fitted by both Phillips and Lipsey suggested a non-linear relationship between $\Delta W$ and the unemployment rate. As a result, the British studies use the reciprocal of the unemployment rate to capture this non-linearity.

Most of the American studies specify the unemployment variable in a straightforward linear form.\textsuperscript{20} The reason given is that the scatter diagram on American data does not clearly indicate a non-linear relationship.

... The United Kingdom studies have suggested the existence of a non-linear relationship between the level of unemployment and the rate of change of money wages, whereas the United States data do not provide any evident support for the use of this type of relationship. However, this comparison may not be too meaningful in that the shortage of United States observations in the under 3 per cent unemployment range may help to explain the lack of an appearance of curvature in the United States relationship.\textsuperscript{21}

\textsuperscript{19} This is referred to in the literature as the alignment problem. See Hines, \textit{op.cit.}, p.243 and Bowen and Berry, \textit{op.cit.}, pp.171-172. The problem is one of aligning the dependent variable with the independent variables so that any implicit lags are theoretically justifiable. In the literature, three methods have been used - the wage-lag method, the first central difference method and the averaged unemployment method. For advantages and disadvantages associated with the three methods see Bowen and Berry, \textit{op.cit.}, pp.171-172.

\textsuperscript{20} See Bodkin, \textit{et al, op.cit.}, pp.50-51.

6.2 RE-ESTIMATION OF WAGE ADJUSTMENT FUNCTIONS FOR THE UNITED STATES IN THE POST-WORLD WAR II PERIOD.

Purposes and Basis of Re-estimation.

The consensus on the usefulness of the Phillips curve model of wage adjustment is in a continuous state of flux. Controversy centers around the stability of the Phillips curve relation. This controversy was sparked off by Friedman. 22 Following the classical economic view that there can be no long-run relation between a money variable, such as the rate of inflation, and a real variable, such as the rate of unemployment, Friedman notes that, "... there is always a temporary trade-off between inflation and unemployment; there is no permanent trade-off. The temporary trade-off comes not from inflation per se, but from unanticipated inflation, which generally means, from a rising rate of inflation." (p.11).

However, many economists continue to accept the basic Phillips curve model as a useful theoretical relationship 23 and therefore continue to experiment with different shift variables, estimation techniques, functional forms, lags and so on.

The primary reason for re-estimating the wage adjustment func-


23. The economists on this side of the camp have been referred to as neo-Keynesians. See A.W. Donner and F. Lazar, "Some Comments on the Canadian Phillips Curve," Economica, Vol. 40 (1973), p.197. The Phillips curve model can be regarded as useful either because we accept the possibility of a long-run trade-off or because Friedman's "temporary" trade-off period is long enough to justify investigation.
tion for the United States in this study is to provide an empirical test of the hypothesis that changes in money wage rates are positively influenced by the level of marketing activity, in the post-World War II period.

**Methodology.**

There are two ways in which we can provide a test of the basic hypothesis \( \Delta W = f(M) \) where \( \Delta W \) is the change in money wage rates and \( M \) is some index of the level of marketing activity. The first method concentrates on a single explanatory variable such as unemployment, profits, or marketing, and compares results. This method has been widely used in American studies in comparing the unemployment hypothesis with the profits hypothesis.

A more widely accepted method is one which begins with a basic relationship between \( \Delta W \) and \( U \), where \( U \) is the unemployment rate, and introduces variables such as profits and marketing as shift variables in a generalized model of wage determination. Here, a comparison can be made between the various shift variables. However, the primary objective in this case is to identify as many shift variables as possible which are both theoretically meaningful and statistically significant.

In the present study a generalized model of wage determination which includes marketing as one of the independent variables, is developed. However, some supplementary tests of the marketing hypothesis are provided by comparing the marketing hypothesis with the profits and unemployment hypothesis. Results obtained in the present study are compared with existing post-World War II studies.
of the U.S. wage adjustment function.

Estimation Technique.

The estimation technique used in the present study is ordinary least squares (OLS). This technique has been used in most of the existing studies of the U.S. Phillips curve. The main criticism against this technique arises from possible simultaneity between the wage and price variables. However, those studies which have attempted to take account of this simultaneous equation bias by using two stage least squares (2SLS) found that the results were not significantly different from the OLS estimates. 24

Variables and Data.

The following variables have been used in the estimating equations.

\[ \Delta W_t = W_{t+1} - W_t \]  = Absolute change in average hourly earnings of non-supervisory workers in the manufacturing sector.

\[ \Delta P_t = P_{t+1} - P_t \]  = Absolute change in the consumer price index.

\[ U_t = \left( \frac{U_t^*}{L_t} \right) (100) \]  = Percentage of labour force unemployed (annual average for the current year). \( U_t^* \) = Unemployed persons aged 16 years and over. \( L_t \) = Labour force aged 16 years and over.

24. See references above. Bodkin, op.cit., p.97 has also observed that the use of average hourly earnings in the manufacturing sector and the consumer price index ameliorates the simultaneity problem since the immediate impact of a wage increase in manufacturing would be on certain selected wholesale prices.
\[ \Delta U_t = U_{t+1} - U_t \] = Absolute change in the percentage of the labour force unemployed.

\[ \text{Pr}_t = \left( \frac{R_t}{E_t} \right) (100) \] = Percentage rate of profit. \( \text{Pr}_t \) = Profits of all manufacturing corporations after Federal income tax. \( E_t \) = Stockholders equity.

\[ \Delta \text{Pr}_t = \text{Pr}_{t+1} - \text{Pr}_t \] = Absolute change in the percentage rate of profit.

\[ M_t = \text{Index of Marketing} \] = First principal component in a principal components analysis of the original variables advertising expenditures, consumer credit balances outstanding and total trademarks issued including renewals.

\[ \Delta M_t = M_{t+1} - M_t \] = Absolute change in the marketing index.

\( T \) = Time trend variable defined as 1, 2, ... \( t \), where \( t \) = total number of observations.

The wage and price variables have been specified as absolute changes rather than percentage changes. As noted earlier both methods have been used in existing studies and there is no a priori reason for favouring one method over another. 25

Following Bodkin, op.cit., a time trend variable was experimented with to see whether the marketing variable was simply proxying for some underlying positive trend in the independent variable. 26

25. Absolute changes were used in the present study because preliminary tests indicated a better fit with absolute changes than with percentage changes. This procedure has been used previously by Bodkin. "Some preliminary experimentation was undertaken to determine the most appropriate form of the wage adjustment equation. Whether variables should be expressed in absolute or percentage form and whether a time trend should be included as an explanatory variable were investigated. After this preliminary study, it was decided to use the absolute wage change, the absolute unemployment level, and the absolute price level change instead of percentage wage and price level changes and unemployment as a percentage of the labor force." Bodkin, op.cit., pp.97-98.

26. In view of the fact that the dependent variable is stated in absolute rather than percentage terms. See Bodkin op.cit., p.98.
The results of equation 1a. (table 6.1) when compared with those of equation 1. clearly indicate that this is not the case. Since the time trend variable did not in any way improve the results it was dropped from the other equations tested.

The specification of the dependent variable in the form $W_{t+1} - W_t$ is referred to as the Wage-Lag method. This method was chosen in preference to the other two methods since it implies roughly a six months time lag in the effect of the independent variables, unemployment, profits, and marketing, on the change in money wage rates.

The Unemployment variable is used in straightforward linear form following most of the existing North American studies. Some preliminary tests using the reciprocal of the unemployment rate did not improve the significance of the unemployment variable.

The profit rate is used in the form specified by Perry, op.cit., Profits after Federal income tax is used since Perry suggested that "the after-tax concept may be conceptually more acceptable." (1966, pp.17-18).

The independent variables specified as changes, i.e., $\Delta U_t$, $\Delta Pr_t$ and $\Delta M_t$, are intended to proxy for the "state of expectations." Each is experimented with to see which provides the best

27. See p.332 above.

28. Phillips article suggested a lag of roughly six months in the relationship between $\Delta W$ and $U$. Kaldor's profit hypothesis suggests some lag in the relationship between $\Delta W$ and $Pr$ and it is reasonable to suppose that marketing affects $\Delta W$ with a lag.
proxy. They are also included in those models used for comparing the unemployment hypothesis, the profits hypothesis, and the marketing hypothesis.

The time period covered in this study is 1948-1971 inclusive. Only annual data is used. The data used in the regressions and the data sources are given in appendix D.

6.3 THE EMPIRICAL RESULTS.

The empirical results are presented in table 6.1. For each equation, table 6.1 provides the coefficient estimates and their respective t-values, the coefficient of multiple determination adjusted for degrees of freedom and the Durbin-Watson statistic.

The results shown in table 6.1 clearly support the basic hypothesis that marketing activity has a positive and significant effect on the change in money wage rates. The coefficients for both the level of marketing and the change in marketing are positive in all equations and significant in all equations for $\Delta M$ and in 5 out of 9 equations for $M$. 

Model 1.

Model 1 is a generalized wage determination model incorporating variables proxying for demand pull, cost push and institutional factors and for expectations. Several variants of this model have been tested and the results are reported in equations 1, 1a, 1b and 1c. In equation 1, the variables $M$ and $\Delta M$ are added to the basic Phillips Curve model, $\Delta W = f(\Delta P, U)$. The coefficient estimates for all the independent variables have the
expected signs. The only variable that is not significant at the .05 level is the unemployment variable. The Durbin-Watson statistic indicates an absence of autocorrelation.\footnote{In all of the equations of this model the Durbin-Watson statistic indicated an absence of autocorrelation.} Over 85 percent of the total variation in the dependent variable is explained by the independent variables.\footnote{This compares favourably with existing studies of the wage adjustment function. See review in Bodkin, et.al., \textit{op.cit.}, chapter 3.}

In equation 1a. a time trend variable is added to see whether the significance of the marketing variables could be attributed to a trend factor. The results clearly indicate that this is not the case. In the first place the coefficient of the trend variable is negative. Secondly, both $M$ and $\Delta M$ continue to be significant at the .05 level - the $t$-value for $M$ falls but the $t$-value for $\Delta M$ increases. The only variable which becomes less significant is the unemployment variable. Clearly the inclusion of the time trend variable does not improve the results.

In equation 1b a profits variable is added to the model to test the hypothesis that an increase in the rate of profit leads
to an increase in the change in money wage rates. The results clearly do not support the hypothesis that the level of profits leads to a change in money wage rates. The coefficient for the profits variable has the wrong sign and is not significant. Furthermore, $R^2$ falls with the inclusion of the profits variable suggesting that the level of profits does not increase the explained variation of the dependent variable. The only positive

31. One of the main proponents of the "profits hypothesis" is G.L. Perry. Perry is also one of the chief proponents of testing wage determination within the context of a generalized model which includes all the independent variables. Most of the early American studies concentrated on a single explanatory variable and compared results. In criticizing this method Perry says, "As with other studies discussed, it is this commitment to one main explanatory variable at a time that is unsatisfactory. If wage rates are influenced by several economic variables, it is important to consider their simultaneous interaction. This is no less true if interest centers on the relation between one of these variables and wage changes. Most of the studies, Bhatia's last one excepted, have centered on the relation between wage changes and unemployment. In the present work, this relation will also be of primary interest since it is directly relevant to the inflation-unemployment problem faced by the economy. But in order to study this relation, it will be necessary to specify the wage-determination equation fully and to estimate the simultaneous effect of all the relevant explanatory variables." Perry, op.cit., 1966, p.18. The inclusion of the profits variable alongside the other explanatory variables is therefore consistent with Perry's preferred model of wage determination.

32. The results of the present study are consistent with several other studies which have tested the profits hypothesis and found profits to be insignificant. The consensus on the profits hypothesis has been summarized by Bodkin. Bodkin found profits to be insignificant in his own study and presented some arguments against those studies which were favourable to the profits hypothesis. His final comment was, "One can argue, therefore, that the three studies that confirm the profits hypothesis are somewhat weaker than the three that do not support it. But such speculation should not be carried too far. The studies of Levinson, Eckstein and Wilson, and Bhatia must be admitted as contradictory evidence, just as those of Klein and Ball, Lipsey and Steuer, and Bowen corroborate the present author's results. In view of the single equation methods used in all these studies, including the results of this section, this issue may well be a fruitful area for future research." Bodkin, op.cit., p.139.
feature of equation 1b is that the unemployment variable is now significant at the .05 level. 33

In equation 1c the change in profits rather than the level of profits is used. The results of this equation are more favourable to the profits hypothesis than equation 1b. \( \Delta \) Pr has the correct sign although it is not significant at the .05 level. The overall results also improve. Both U and M are now significant and \( \bar{R}^2 \) is larger. 34

Model 2.

Model 2 is also a generalized wage determination model. In addition to providing further support for the basic hypothesis that marketing activity leads to an increase in money wage rates, this model attempts to compare the marketing hypothesis with the profits and unemployment hypothesis and provide some empirical evidence for choosing among \( \Delta M \), \( \Delta U \) and \( \Delta Pr \) as proxy variables for the effect of expectations on wage push. Several variants of this model were experimented with and are reported as equations 2, 2a, 2b and 2c.

In equation 2, both \( \Delta M \) and \( \Delta Pr \) are included as proxy variables for the state of expectations. Clearly the results support the use of \( \Delta M \) since \( \Delta M \) is significant and \( \Delta Pr \) is not. 35

33. The coefficient for \( X \) becomes insignificant at the .05 level. However \( \Delta M \) is still highly significant.

34. In general, the change in profits performs much better than the level of profits in the present study. See results of models 2, 3 and 4.

35. The marketing hypothesis also performs better than the profits hypothesis in terms of the variables included in level form. This is so since \( Pr \) has the wrong sign while \( M \) has the correct sign. \( M \) is also significant at the .10 level.
equation 2a where $\Delta M$ is omitted, the performance of $\Delta Pr$ as a proxy variable for the state of expectations improves. However, equation 2a should be compared with equation 1b where $\Delta M$ is included and $\Delta Pr$ is excluded. Clearly the performance of $\Delta M$ is better than that of $\Delta Pr$ - t-value for $\Delta M$ is 2.9 compared with 1.77 for $\Delta Pr$. $R^2$ in equation 1b is 0.827 compared with 0.780 in equation 2a.

In equation 2b, $\Delta U$ is used for the first time. $\Delta Pr$ is also included in this equation. The performance of $\Delta U$ and $\Delta Pr$ is about the same. In equation 2c, $\Delta U$ is included with $\Delta M$. As in the case of $\Delta Pr$, $\Delta M$ performs much better than $\Delta U$. Comparing we see that in equations 2 and 2c where $\Delta M$ is included $R^2$ is higher than in equations 2a and 2b where $\Delta M$ is excluded. The results therefore favour the use of $\Delta M$ as a proxy variable for the state of expectations, compared to either $\Delta U$ or $\Delta Pr$.

Model 3.

Model 3 is a less generalized model compared with models 1 and 2. It consists of only five independent variables, including the

36. $M$ also performs better than $Pr$ in equation 2a thus confirming the results of equation 2.

37. Equation 2b is the first equation which shows some sign of autocorrelated residuals. For $n = 23$ and $K = 5$ (plus a constant term), $D_u = 1.92$. Hence, the DW value of 1.75 is just inside the indeterminate range. Re-estimation of this equation with the Hildreth-Lu procedure gave a DW value of 1.73.

38. The DW value obtained with the original OLS estimate was 1.96. However, in this case re-estimation with the Hildreth-Lu procedure improved the DW value.

39. These results so far are neutral as between the choice of $\Delta U$ or $\Delta Pr$. This is in general agreement with existing empirical studies since some tend to favour $\Delta U$ while others favour $\Delta Pr$. 
constant term. This model is therefore closer to those models which attempt to compare the unemployment and profits hypotheses by concentrating on one variable at a time. It can therefore be viewed primarily as an attempt to compare the marketing hypothesis with the profits and unemployment hypotheses. However, it also provides further support for the basic hypothesis relating $\Delta W$ to marketing.

Two equations were tested in this model. These are equations 3 and 3a.$^{40}$

The results of equation 3 are neutral with regards to the choice between $\Delta M$ and $\Delta Pr$. In fact, since both $\Delta M$ and $\Delta Pr$ are highly significant, this model suggests that both should be included in the wage determination function. In this model the unemployment variable is also highly significant.

Equation 3a performs less well. $\Delta M$ is still highly significant but $\Delta U$ is not. $R^2$ is also less in equation 3a than in equation 3. Model 3 therefore favours the use of $\Delta M$ and $\Delta Pr$ but not $\Delta U$.

Model 4.

Model 4 is even less generalized than model 3. It therefore provides a further comparison of the three hypotheses with a minimum of independent variables. Three equations are tested in this model. These are equations 4, 4a and 4b.

40. The Durbin Watson statistic indicates an absence of autocorrelation in this model.
TABLE 6.3
Estimates of Parameters For The Wage Adjustment Function.

<table>
<thead>
<tr>
<th>Model/Equation</th>
<th>Method of Estimation</th>
<th>Constant</th>
<th>Coefficient of $\Delta P$</th>
<th>Coefficient of $U$</th>
<th>Coefficient of $\Delta M$</th>
<th>Coefficient of $\Delta U$</th>
<th>Coefficient of $\Delta Pr$</th>
<th>Coefficient of $T$</th>
<th>R/DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>OLS</td>
<td>$a_0 = 0.080$</td>
<td>$a_1 = 0.016$</td>
<td>$a_2 = -0.005$</td>
<td>$a_3 = 0.016$</td>
<td>$a_4 = 0.050$</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1a.</td>
<td>OLS</td>
<td>$a_0 = 0.121$</td>
<td>$a_1 = 0.014$</td>
<td>$a_2 = -0.006$</td>
<td>$a_3 = 0.051$</td>
<td>$a_4 = 0.062$</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1b.</td>
<td>OLS</td>
<td>$a_0 = 0.121$</td>
<td>$a_1 = 0.017$</td>
<td>$a_2 = -0.007$</td>
<td>$a_3 = 0.011$</td>
<td>$a_4 = 0.056$</td>
<td>$a_5 = -0.006$</td>
<td>$a_6 = 0.004$</td>
<td>$a_7 = 0.833$</td>
</tr>
<tr>
<td>1c.</td>
<td>OLS</td>
<td>$a_0 = 0.091$</td>
<td>$a_1 = 0.017$</td>
<td>$a_2 = -0.008$</td>
<td>$a_3 = 0.012$</td>
<td>$a_4 = 0.044$</td>
<td>-</td>
<td>-</td>
<td>$a_8 = 0.931$</td>
</tr>
<tr>
<td>2.</td>
<td>OLS</td>
<td>$a_0 = 0.112$</td>
<td>$a_1 = 0.018$</td>
<td>$a_2 = -0.008$</td>
<td>$a_3 = 0.010$</td>
<td>$a_4 = 0.048$</td>
<td>$a_5 = 0.002$</td>
<td>$a_6 = 0.003$</td>
<td>$a_7 = 0.826$</td>
</tr>
<tr>
<td>2a.</td>
<td>OLS</td>
<td>$a_0 = 0.085$</td>
<td>$a_1 = 0.017$</td>
<td>$a_2 = -0.007$</td>
<td>$a_3 = 0.011$</td>
<td>-</td>
<td>$a_4 = 0.001$</td>
<td>$a_5 = 0.006$</td>
<td>$a_6 = 0.780$</td>
</tr>
<tr>
<td>2b.</td>
<td>OLS</td>
<td>$a_0 = 0.112$</td>
<td>$a_1 = 0.015$</td>
<td>$a_2 = -0.010$</td>
<td>$a_3 = 0.013$</td>
<td>-</td>
<td>$a_4 = -0.005$</td>
<td>$a_5 = 0.004$</td>
<td>$a_6 = 0.794$</td>
</tr>
<tr>
<td>2c.</td>
<td>OLS</td>
<td>$a_0 = 0.091$</td>
<td>$a_1 = 0.017$</td>
<td>$a_2 = -0.008$</td>
<td>$a_3 = 0.012$</td>
<td>$a_4 = 0.047$</td>
<td>$a_5 = 0.0008$</td>
<td>-</td>
<td>$a_6 = 0.931$</td>
</tr>
</tbody>
</table>

See notes at end of table.
Table 6.3: Estimates of Parameters for the Wages Adjustment Function (continued)

<table>
<thead>
<tr>
<th>Model Equation</th>
<th>Method of Estimation</th>
<th>Coefficient of ( t )</th>
<th>Coefficient of ( \Delta_l )</th>
<th>Coefficient of ( \Delta_{fr} )</th>
<th>Coefficient of ( \Delta_{fr}^2 )</th>
<th>Coefficient of Durbin-Watson (DW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>OLS</td>
<td>0.021</td>
<td>-0.009</td>
<td>0.001</td>
<td>-0.005</td>
<td>0.020</td>
</tr>
<tr>
<td>3a</td>
<td>OLS</td>
<td>0.073</td>
<td>-0.005</td>
<td>-0.007</td>
<td>-0.002</td>
<td>0.047</td>
</tr>
<tr>
<td>3b</td>
<td>OLS</td>
<td>0.077</td>
<td>-0.003</td>
<td>-0.008</td>
<td>-0.002</td>
<td>0.047</td>
</tr>
<tr>
<td>3c</td>
<td>(H-L Lu)</td>
<td>0.053</td>
<td>(2.6)*</td>
<td>(2.4)*</td>
<td>(2.1)*</td>
<td>(2.3)*</td>
</tr>
</tbody>
</table>

Notes:
1. H-L Lu indicates that the OLS results are purged of autocorrelation by using the modified Hildreth-Lu procedure. The \( \Delta \) subscript indicates that we are using the modified Hildreth-Lu procedure (see Massager, 73, p. 4-67-5).
2. \( t \)-values are given in parentheses. The * following the \( t \)-value indicates that the coefficient is significant at the 0.05 level.
3. The first value is the coefficient of multiple determination adjusted for degrees of freedom. The second value is the Durbin-Watson statistic. The t-values are given in parentheses. The * following the t-value indicates that the coefficient is significant at the 0.05 level.
The results of model 4 provide further support for the marketing hypothesis. In equation 4 both of the marketing variables are highly significant. In equation 4a neither of the profits variables are significant. In equation 4b only the change in unemployment variable is significant. In terms of $R^2$ also, equation 4 performs best.

---

41. Since there are only three independent variables - excluding the constant term - in this model, $D_u = 1.66$. Hence, the DW value in equations 4 and 4a indicate an absence of autocorrelation. Equation 4b was re-estimated to purge the original results of autocorrelation. However, the DW value is still in the indeterminate range.
Marketing in a Static Keynesian Model.

Marketing expenditure was introduced as another component of aggregate demand in a static Keynesian model. It was suggested that marketing expenditure should be treated as another injection into the circular flow of income similar to investment and government expenditures. Although the data on total marketing expenditure was not available, data on several components of marketing expenditure clearly indicated that the marketing sector has grown relative to the investment sector in the post-World War II period. The marketing sector is currently at least as large as the investment sector.

The rise of the marketing sector, together with the growth of the public sector, provides one explanation for the failure of Keynes' stagnation thesis to materialize in the affluent post-war economy of the United States.

It was found that because of the relationship between marketing and aggregate consumption, the multiplier associated with a given change in marketing expenditure was larger than the corresponding multiplier for changes in investment and government expenditures. While this increases the instability of the system, the trend increase in marketing expenditure in the post-war period has added more to total aggregate demand and income than if the multiplier was equal to the investment or government multiplier.
Marketing in a Dynamic Harrod-Domar Model.

Another hypothesis of this thesis is that marketing activity leads to an increase in the supply of labour and to an increase in money wage rates which is accompanied by increases in productivity. This means that marketing expenditure add both to the aggregate demand and aggregate capacity of the economy. Since this is the same dual character which makes investment the dynamic variable in the Harrod-Domar model, marketing was introduced as another dynamic variable, similar to investment, in a simple Harrod-Domar model of growth.

With marketing as the only dynamic variable in the Harrod-Domar growth model, the full employment steady state solution requires marketing to grow at the constant compound rate \((s(1-a_1))/(1+a_2)\) where \(s\) is the marketing coefficient, \(a_1\) is the marginal propensity to consume and \(a_2\) is the change in consumption with respect to a change in marketing.

When both marketing and investment are introduced as dynamic variables in the Harrod-Domar model the full employment steady state solution becomes

\[
\sigma I + sM = (1/(1-a_1))(dI/dt) + ((1+a_2)/(1-a_1))(dM/dt)
\]

where \(\sigma\) is the capital coefficient. It was found that if \(s < \sigma\), the rate of growth of investment required to maintain full employment in steady state equilibrium would be less when marketing is included in the model than when marketing is excluded from the model.

1. See chapter 3.
The inclusion of marketing in the Harrod-Domar model provides a mechanism for introducing technological progress embodied in labour. It also provides some insights into the interaction between sources of productivity increase.

The inclusion of marketing also increases the flexibility of the Harrod-Domar model from the supply side and possibly from the demand side. This means that outside steady state equilibrium marketing will tend to propel the system towards its equilibrium path rather than away from it as investment does.

Marketing and Aggregate Consumption.

The hypothesis that marketing increases aggregate consumption was tested within a simultaneous equation model of the goods market. Two marketing equations were developed, one based on uncertainty and the other based on the stock-adjustment model. The stock-adjustment model of investment behaviour was also modified to take account of the effect of marketing activity on investment expenditures.

Several indices of marketing activity were suggested and used in the empirical tests. These indices were in general more comprehensive, i.e., they incorporated more components of the marketing-mix, than the indices used in previous empirical studies and in previous theoretical discussions of the relationship between marketing and aggregate consumption.

The empirical results support the basic hypothesis that marketing activity leads to upward shifts in the aggregate consumption function. The empirical results therefore confirm the re-
sults obtained in existing empirical tests of this hypothesis.

The coefficient estimates obtained in the empirical tests were used to provide crude estimates of the short-run and long-run marketing multipliers. These were compared with the investment multipliers.

Marketing and the Supply of Labour.

The classical theory of labour supply was modified to take account of the dynamic effect of marketing on the labour supply of households and in the aggregate. The backward bending supply curve of labour developed by the classical analysis was accepted as an instantaneous picture of labour supply behaviour. However, it was suggested that classical theory cannot explain labour supply behaviour over time in the post-World War II period. This is because the aggregate labour supply in the post-war period is subject to outward shifts due to increases in marketing activity. These outward shifts tend to offset the increase in the quantity of leisure demanded as wage rates increase, implied by the backward bending instantaneous curve. The theory developed in this thesis was used to explain the rise in female participation rates and the tendency for average weekly hours of full time workers to increase in the post-World War II period.

The hypothesis that marketing leads to an increase in the supply of labour was tested in three different single equation models of labour supply. The empirical results support the hypothesis.
Marketing and Changes in Money Wage Rates.

The desire for higher levels of income induced by marketing activity makes itself felt not only in an increased supply of labour but also in the demand for higher wage rates. Labour is able to force up money wage rates by a continuous process of "quitting and searching" for better paid employment. Some of the prerequisites for making such a process effective are a high degree of labour mobility and the willingness to acquire new skills, increased education and training. This process leads to an increase in labour productivity which permit increases in real wage rates.

The hypothesis that marketing leads to an increase in money wage rates was tested within the framework of a generalized single equation Phillips curve model. The results support the basic hypothesis. In addition, when the marketing hypothesis is compared with the unemployment and profits hypotheses, the results favour the marketing hypothesis relative to the other two hypotheses.

7.2 LIMITATIONS.

Data Limitations.

Perhaps the most important limitation of the present study follows from the unavailability of data on total marketing expenditures. Lack of such data means that the precise size of the marketing sector cannot be determined. In addition, the theoretical model developed in this thesis suggests that consumption and investment expenditures should be measured net of mar-
keting costs. Since this is not possible with the present system of national income accounting the empirical tests are subject to observational errors. Finally, accurate estimates of the absolute size of the coefficient measuring the change in aggregate consumption for a one dollar increase in marketing expenditures require data on total marketing expenditures. Accurate estimates of impact and long-run multipliers also depend on the latter estimate.

Model Limitations.

The primary limitation of the simplified Keynesian model used to test the aggregate consumption function is that it does not include the monetary sector. The inclusion of a monetary sector would affect the predictions of the model not only through the effect of the rate of interest on investment but also through the effect of the rate of interest on the cost of marketing goods especially consumer credit. In using consumer credit as one of the components of the marketing-mix to form the index of marketing used in the empirical tests it was noted that this makes it difficult to isolate the effect of monetary policy on aggregate consumption from that of marketing. The problem is whether the availability and cost of consumer credit is autonomous or whether they are demand determined. Casual empiricism would tend to suggest that terms and availability are demand determined since "credit squeezes" seem to have little impact on the consumer cre-
dit market in North America.\textsuperscript{2} However, this requires further empirical investigation.

The specification of a marketing function relating marketing expenditure to aggregate income\textsuperscript{3} in the simultaneous equation model used to test the relationship between aggregate consumption and marketing would remove some of the "money-supply" effect on consumption which the consumer credit component of marketing might be proxying for.\textsuperscript{4} However, this again suggests the need to include the monetary sector explicitly in the model.

A second limitation follows from the exclusion of a foreign sector. This limitation is likely to be an important one if the model is applied to economies with a relatively larger foreign sector such as the Canadian economy. However, a simple way of taking account of external influence in the case of the Canadian economy would be to include both Canadian marketing expenditures and U.S. marketing expenditures as independent variables in the

\textsuperscript{2} For example, throughout the post-World War II period consumers seem to be able to get whatever credit they demanded and real rates of interest have not changed noticeably. This is in marked contrast to the housing market where "tight" credit does affect demand or to consumer credit in Great Britain where the terms and availability of "hire-purchase" credit are important policy variables.

\textsuperscript{3} See chapters 3 and 4.

\textsuperscript{4} This would be the case if we accept that there is a relationship between the level of income and the money supply.
empirical tests, providing that there is no serious multico-
llinearity problem.

7.3 SUGGESTIONS FOR FUTURE RESEARCH.

Economics and marketing have developed as separate disci-
plines. Whatever integration has taken place in the two dis-
ciplines has been restricted to microeconomics. This has been so from both sides of the fence. Traditionally marketing theo-
rists have always incorporated some economic analysis in their work. However, since they are concerned with the behaviour of the firm their economic analysis has been restricted to micro theory. From the economics discipline the major attempt to draw from marketing theory was also to explain the behaviour of the firm under conditions of monopolistic competition.

This thesis suggests that macro theory can also benefit from an integration of marketing and economic analysis. If it is ac-
cepted that marketing activity has an important impact on the ma-
cro economy, marketing behaviour in the aggregate should be in-
vestigated. This requires not only the collection of data on marketing costs and a change in national income accounting, but also the specification and testing of an aggregate marketing function similar to the investment function. It also means that

5. In existing studies of the Canadian Phillips curve the in-
fluence of U.S. wages on Canadian wage rates is taken into account by including the U.S. wage rate as an independent variable.
Macroeconomic models have to be modified to include a separate marketing sector which is distinct from the consumption, investment, government and foreign sectors.

In addition to providing a separate aggregate demand sector, this thesis suggests that marketing shifts out the production possibilities frontier by increasing the labour supply and the productivity of the labour force. This means that marketing contributes to the growth of the economy both from the side of aggregate demand and from the side of aggregate supply. Investigation of the relevance and significance of marketing should therefore become an integral part of the theory of growth.

In this thesis a distinction has been made between a developed and an affluent society. It has been maintained that intensive marketing activity occurs only in an affluent society and is one of the factors which supports and enhances the affluence of that society. This theory suggests that there are three types of economic societies - the underdeveloped, the developed and the affluent. While there are an almost infinite number of theories of economic development it is difficult to argue with the casual observation that intensive capital investment is a necessary prerequisite for an economy to transform itself from the underdeveloped stage to the developed stage. While investment is the key to economic development, this thesis suggests that marketing is the key to moving from the developed to the affluent society. From this point of view investigation of the relevance and significance of marketing should become an integral part of the theory.
of economic development. Another area of research which this thesis has not considered is the effect of marketing activity on inflation. Marketing activity can contribute both to demand-pull and cost-push inflation. Since marketing expenditures are an injection into the circular flow of income, if it shifts up the aggregate demand schedule above the full employment output of the economy this will produce demand-pull inflation. From the cost-push side, since marketing leads to an increase in the change in money wage rates, some of this change in money wage rates may be passed on as price increases. The increase in marketing activity in the post-World War II period therefore, may have contributed to the continuous post-war inflation.

6. In the recent theories of growth and development there has been some questioning of the traditional attitudes which seemed to accept growth as an end in itself. These recent theories tend to question the traditional indices of growth - for example rising per capita incomes - and point out some of the adverse effects of growth - pollution of the environment, increasing income inequalities and the creation of "deprivation effects." All these recent arguments against growth as an end in itself are equally relevant when evaluating the benefits of transforming from a developed to an affluent society. Such a transformation is not necessarily beneficial to the "development" of the society. For the affluent society seems caught in what one may view either as a virtuous or a vicious circle. This is clearly brought home by what Galbraith calls the dependence effect.

"Were it so that a man on arising each morning was assailed by demons which instilled in him a passion sometimes for silk shirts, sometimes for kitchenware, sometimes for chamber pots, and sometimes for orange squash, there would be every reason to applause the effort to find the goods, however odd, that quenched this flame. But should it be that his passion was the result of his first having cultivated the demons, and should it also be that his effort to allay it stirred the demons to ever greater and greater effort, there would be question as to how rational was his solution. Unless restrained by conventional attitudes, he might wonder if the solution lay with more goods or fewer demons." Galbraith, The Affluent Society, op. cit., p.153.
Finally, there is the question as to whether the continuous expansion in the capacity of the economy caused by marketing activity leads to a rising rate of unemployment. From the point of view of short-run Keynesian macroeconomics marketing expenditure increases aggregate demand and therefore offsets any tendency for aggregate demand to fall short of aggregate supply. Marketing therefore provides a short-run bulwark against demand deficient unemployment of the kind suggested by Keynes' stagnation thesis.

However, over the longer run marketing can lead to unemployment. In the context of the growth model where the effect of marketing on both aggregate demand and aggregate supply is taken into account, marketing adds to the capacity of the economy by inducing a substitution of capital for labour, by increasing hours of work, by increasing participation rates and by increasing the efficiency of labour. All these factors have the potential of creating unemployment.

Consider a departure from the steady-state growth path caused by some exogenous change in the marketing coefficient such that a dollar of marketing expenditure now adds more to aggregate capacity than previously. In this disequilibrium situation the rate of unemployment will rise. It was suggested that the model is stable in that with rising unemployment each dollar of marketing expenditure will begin to add less and less to aggregate capacity thus moving the system back to a steady state path. However, the rate of unemployment necessary to return the system to a steady-state path might be intolerably high. Moreover, this rate of unemployment is likely to increase over time as higher and higher rates of unemployment become acceptable in the sense that workers continue to bid up wages at these high rates of unemployment.
Historically, technological progress which has increased the productivity of labour has not created a long-run unemployment problem partly because of the concomitant increase in the demand for leisure. As noted in chapter 1 and chapter 5 of this thesis there has been no increase in the demand for leisure by the household in the post-World War II period. One result of this is rising unemployment rates. If labour will not voluntarily accept part of its affluence in the form of increased leisure then the market mechanism will solve the problem by enforcing full-time leisure on part of the labour force. A recent article has observed that:

Controlling inflation will not solve all of our socio-economic problems.

We must redistribute work. We haven't made a significant change in our wage and hour laws since the 1930's or early 1940's.

We have had 40 years of technological change, but we still cling to the eight-hour day and the 40-hour week as the standard. If we are going to do anything about the six million people out of work, we will have to redistribute employment.

---

The purpose of this appendix is to provide some crude estimates of the absolute size of the various multipliers discussed in part 1 of chapter 3. It was noted in that chapter that the marketing multiplier will be greater than the government or investment multiplier. This appendix provides some estimates of the absolute size of this difference based on the empirical results of chapter 4.

To be able to calculate the absolute size of the various multipliers it is necessary to have data on total marketing expenditures. Since such data is not available the multipliers are computed from the coefficient estimates of the consumption function using advertising expenditures as the index of marketing activity on the assumption that total marketing expenditures are six times the value of total advertising expenditures. On the basis of this assumption a straightforward linear transformation can be made from the coefficient estimate of advertising to obtain the coefficient estimate of marketing, i.e., the coefficient estimate $\delta C / \delta M = (1/6)(\delta C / \delta A)$.

1. These multipliers were defined in chapter 3 as follows:
   Investment multiplier = $\Delta Y / \Delta I$.
   Government multiplier = $\Delta Y / \Delta G$.
   Marketing multiplier = $\Delta Y / \Delta M$.

2. This assumption is based on the study by Kjaer-Hansen, op. cit. Kjaer-Hansen found that advertising was approximately 17 percent of total promotional costs in Denmark in 1963 (p.41). As noted in chapter 2 the study by Kjaer-Hansen is the only one in which some attempt is made to distinguish between marketing expenditures on promotion and marketing expenditures on physical distribution.
Another simplifying assumption which has to be made is that the coefficient estimates for \( a_{on} \) and \( a_{1n} \) in the equation
\[
C_n = a_{on} + a_{1n}Y_d + a_2M
\]
(see p.131 above) can be approximated by the coefficient estimates for \( a_0 \) and \( a_1 \) respectively, in the equation
\[
C = a_0 + a_1Y_d + a_2M.
\]
This simplification is also due to the lack of available data on total marketing expenditures which makes it impossible to estimate the consumption function by using aggregate consumption expenditures net of marketing costs.

The Model with Exogenous Investment and Marketing.

In this model the equilibrium level of income is given by equation 6a.1 (p.132). 
\[
y = \frac{a_0 - a_1T - a_1D + (1+a_2)M + I + G}{1-a_1}
\]
\[
dY/dI = dY/dG = 1/(1-a_1); \quad dY/dM = (1+a_2)/(1-a_1).
\]
The estimates of \( a_1 \) and \( a_2 \) are obtained from model 14, equations 14 and 14f, in table 4.1. Equation 14 gives the OLS results and equation 14f the 2SLS results. These results are reproduced below for easy reference.

\[
\begin{align*}
14. \quad C &= 13.2 + 0.86Y_d + 0.92A \\
&\quad (5.0) \quad (59.1) \quad (2.5) \\
R^2 &= 0.9990 \quad ; \quad DW = 1.83
\end{align*}
\]

3. Values in parenthesis are t-values. There is a substantial difference between the OLS and 2SLS estimates of the coefficient for \( A \) in this model. A priori, the estimate for the coefficient of \( Y_d \) has an upward bias and the estimate for the coefficient of \( A \) has a downward bias in equation 14. This points to equation 14f. Unfortunately, \( DW = 0.85 \) means that \( H_0: \rho = 0 \), is rejected at the .05 level. The t-values cannot therefore be relied on for determining the significance of the coefficients. The computing program used does not permit both 2SLS estimation and correcting for autocorrelation.
Performing the linear transformation, \( M = 6A \), the new results are:

\[
\begin{align*}
14f. & \quad C = 3.0 + 0.79Y_d + 3.26A \\
& \quad (3.1) (31.1) (3.7) \\
R^2 &= 0.9937 \quad DW = 0.85
\end{align*}
\]

On the basis of the OLS results \( dY/dI = dY/dG = 1/0.14 = 7.14 \).
\( dY/dM = 1.153/0.14 = 8.24 \). On the basis of the 2SLS results
\( dY/dI = dY/dG = 1/0.21 = 4.76 \). \( dY/dM = 1.543/0.21 = 7.35 \). Thus a
one dollar increase in autonomous marketing expenditure produces
a greater increase in income and employment than a one dollar in-
crease in autonomous investment or government expenditures. The
difference in the size of the multipliers is much more signifi-
cant for the 2SLS results than for the OLS results.

The Model with Endogenous Investment and Marketing.

The equations describing this model are shown on p.155 above.
The formulas for the multipliers are identical to the previous
cases. However, with investment and marketing endogenous, the co-
efficient estimates for \( a_1 \) and \( a_2 \) are different and only the auto-
nomous components of marketing and investment expenditures would
have these multiplier effects. These estimates are obtained from eq-
uation 14c of table 4.1 and are reproduced below for easy reference. 4

4. Values in parenthesis are t-values. As can be seen from com-
paring equations 14, 14c and 14f the 2SLS results with endoge-
nous investment and marketing are closer to the OLS results
than to the 2SLS results with exogenous investment and market-
ing. However, these results also confirm the a priori expec-
tation that the OLS results will produce an upward bias in the
coefficient estimate of \( Y_d \) and a downward bias in the coeffic-
ient estimate of \( A \). The t-value for \( A \) has fallen in equation
14c but is still significant at the .05 level. DW is now in
the indeterminate range.
Performing the linear transformation \( M = 6A \), the new results are:

\[
C = 8.5 + 0.35Y_d + 1.70A
\]

\[
R^2 = 0.9989 \quad \text{DW} = 1.26
\]

The values of the multipliers based on these coefficient estimates are:

\[\frac{dY}{dI} = \frac{dY}{dG} = 1/0.15 = 6.67, \quad \frac{dY}{dM} = 1.217/0.15 = 8.11.\]

As expected, the multiplier for the autonomous component of marketing is larger than the multiplier for autonomous investment.

**Extension of the Basic Model - Lags in Consumer Behaviour and Marketing.**

The equation describing the model with lags in consumer behaviour and marketing is shown on p.157 above. In this model both impact and long-run multipliers can be estimated. The coefficient estimates are obtained from the equations in model 2, table 4.1. Equation 2a is selected from model 2 as providing the best coefficient estimates.\(^5\) These estimates are reproduced below.\(^6\)

\[
C = -0.71 + 0.57Y_d + 7.4A + 6.36C_{-1} - 6.6A_{-1}
\]

\[
R^2 = 0.9989 \quad \text{DW} = 1.94
\]

\(^5\). The coefficient estimates for \( C_{-1} \) and \( Y_d \) are "reasonable" based on other existing studies. All other coefficients except for the constant term are significant. There is no indication of autocorrelation and \( R^2 \) is high. See the discussion of the results of model 2 on pp.216-219.

\(^6\). Values in parenthesis are t-values.
Performing the linear transformation $M = 6A$, the new results are:

$$2a': \quad C = -0.71 + 0.57Y_d + 1.23M + 0.36C_{-1} - 1.1M_{-1}$$

The values of the impact multipliers are

$$\frac{dY}{dI} = \frac{dY}{dG} = \frac{1}{0.43} = 2.33, \quad \frac{dY}{dM} = \frac{2.23}{0.43} = 5.19.$$ The impact multiplier associated with an autonomous change in marketing is much larger than the impact multiplier associated with an autonomous change in investment because of the relatively large coefficient estimate of marketing when lagged marketing is included in the model.7

To determine the long-run multipliers for government expenditure and autonomous investment it is necessary to compute the long-run mpc. The long-run mpc can be computed by calculating the annual rate of growth of consumption over the time period which generated the observations. This is the period 1947-1972 inclusive, in the present case. Real consumption expenditures increased from 106.3 billion dollars in 1947 to 526.8 billion dollars in 1972 - see table 1.1. This means an annual rate of growth of 3.8%.8 The long-run mpc can now be computed as follows: \[ C = (1 + 0.038)C_{-1}. \] Substituting for $C_{-1}$ into the consumption equation, $C = -0.71 + 0.57Y_d + 1.23M + (0.36/1.038)C - 1.1M_{-1}$.

7. The effect of marketing on consumption is less in the long-run than in the short-run. See chapter 4, p.232.

8. Using the formula $526.8 = 206.3(1+r)^n$. In this case $n = 25$.

Therefore $(526.8/206.3)^{1/25} - 1 = r$. $1/25 \log 2.554 = 1/25(0.407221) = 0.01629$. Antilog = 1.038, $r = .038$.

9. See Evans, op. cit., p.70.
Therefore, \[ C(1 - (0.36/1.038)) = -0.71 + 0.57Y_d + 1.23M - 1.1M_{-1}. \]

\[ C = -0.71/0.65318 + (0.57/0.65318)Y_d + (1.23/0.65318)M - (1.1/0.65318)M_{-1}. \]

\[ C = -1.09 + 0.873Y_d + 1.883M - 1.684M_{-1}. \]

Therefore the long-run mpc is 0.873.

The long-run multiplier for autonomous investment or government expenditures is \( 1/0.127 = 7.87 \) which is a significant increase over the short-run multiplier of 2.33.

To compute the long-run multiplier for autonomous marketing expenditures it is necessary to calculate the annual rate of growth of marketing over the same time period. Assuming total marketing expenditures to be six times total advertising expenditures, real marketing expenditures increased from 34.26 billion dollars in 1947 to 94.68 billion dollars in 1972 (see table 1.2). This means an annual rate of growth of \( 4.15\% \).\(^{10}\) Substituting \( M = (1.0415)M_{-1} \) into the consumption function

\[ C = -1.09 + 0.873Y_d + 1.883M - (1.684/1.0415)M \]

\[ C = -1.09 + 0.873Y_d + (1.883 - 1.617)M = -1.09 + 0.873Y_d + 0.266M \]

The long-run multiplier for autonomous marketing expenditures is \( 1.266/0.127 = 9.97 \) which is also a significant increase over the short-run marketing multiplier of 5.19. As expected, the long-run

\[ (94.68/34.26)^{1/25} = 2.764^{1/25} = 1/25 \log 2.764 \]

\[ = 1/25 (0.441539) = 0.01766. \text{ Antilog } = 1.0415, r = 0.0415. \]
multiplier for autonomous marketing is greater than the long-run multiplier for government expenditure or autonomous investment. However, the difference is not as great as in the short-run since the negative coefficient for $M_{-1}$ acts as a significant damper on the absolute size of the long-run marketing multiplier.
APPENDIX B.

DATA AND DATA SOURCES OF VARIABLES USED IN ESTIMATING THE CONSUMPTION FUNCTION.

Definition and Sources.

C = Consumption expenditure in billions of 1958 dollars.  

I = Gross private domestic investment expenditure in billions of 1958 dollars. Source: As for variable C.

G = 101+102 = Government purchases plus net exports, in billions of 1958 dollars. 101 = Government purchases of goods and services. Source: As for variable C. 102 = Exports less imports. Source: As for variable C.

Y = Gross National Product in billions of 1958 dollars.  
Source: As for variable C.


$S_c+t_p = w_g+w_b+p-Y_d. S_c = \text{Corporate net saving in billions of 1958 dollars. t_p = Personal tax and non-tax payments in billions of 1958 dollars.}$

$D+t_b = Y-w_g-w_b-p. D = \text{Depreciation at replacement cost in billions of 1958 dollars. t_b = Indirect business taxes and corporate tax liability plus statistical discrepancy less subsidies, in billions of 1958 dollars.}$

$G_d = G-S_c-t_p-D-t_b = \text{Government purchases plus net exports less taxes, less depreciation, in billions of 1958 dollars.}$
\[ d = \frac{125}{133} = \text{Depreciation at original cost in billions of 1958 dollars.} \]
\[ 133 = \text{Gross private domestic investment deflator, 1958 = 100. Source: Economic Report of the President, Jan. 1973, Table C-3, p.196.} \]

\[ K = \text{Capital Stock in billions of 1958 dollars = Cumulation of } I_i - d_i \text{ from } i = 1946 \text{ through } i = 1972, = \sum_{i=1946}^{1972} I_i - d_i, K_{1945} = 0. I^* = I - d = \text{Net private domestic investment in billions of 1958 dollars.} \]

\[ A = \frac{151}{121} = \text{Advertising expenditure in billions of 1958 dollars.} \]

\[ R&D = \frac{152}{121} = \text{Industrial research and development expenditures in billions of 1958 dollars.} \]
\[ 152 = \text{Industrial research and development expenditures in current dollars. Source: Statistical Abstract of the United States, Various Issues.} \]

\[ R = \frac{153}{113} = \text{Total consumer credit balances outstanding in billions of 1958 dollars.} \]
\[ 153 = \text{Total consumer credit balances outstanding in current dollars. Source: Economic Report of the President, Jan. 1973 Table C-58, p.262.} \]

\[ K_e = A + R&D + R_{15}. \]
\[ R_{15} = 15\% \text{ of } R = \text{Estimated cost of consumer credit.} \]
\[ R_e = \frac{154}{123} = \text{Instalment credit extended in billions of 1958 dollars.} \]
\[ 154 = \text{Instalment credit extended in current dollars.} \quad \text{Source: Economic Report of the President, Jan. 1973 Table C-59, p.263.} \]

\[ R_n = \text{Net increase in consumer credit balances outstanding in billions of 1958 dollars} = \left(153_t - 153_{t-1}\right)/123 \text{ for } t = 1946 \text{ through } t = 1972. \]

\[ T = \text{Total trademarks issued including renewals.} \quad \text{Source: As for variable R&D.} \]

\[ T_n = \text{New trademarks issued.} \quad \text{Source: As for variable R&D.} \]

\[ P = \text{Total patents issued.} \quad \text{Source: As for variable R&D.} \]

\[ MARR&D = \text{First principal component in a principal components analysis of the original variables } A, R \text{ and R&D.} \quad 97.70 \text{ percent of the total variability of the original variables was explained by the first principal component.} \]

\[ M\text{ART} = \text{First principal component in a principal components analysis of the original variables } A, R \text{ and } T. \quad 93.27 \text{ percent of the total variability of the original variables was explained by the first principal component.} \]

\[ M\text{AR} = \text{First principal component in a principal components analysis of the original variables } A \text{ and } R. \quad 99.66 \text{ percent of the total variability of the original variables was explained by the first principal component.} \]

\[ M\text{ART}_n = \text{First principal component in a principal components analysis of the original variables } A, R \text{ and } T_n. \quad 91.70 \text{ percent of the total variability of the original variables was explained by the first principal component.} \]
First principal component in a principal components analysis of the original variables $A$, $R_n$ and $T_n$. 75.61 percent of the total variability of the original variables was explained by the first principal component.

First principal component in a principal components analysis of the original variables $A$, $R_e$ and $P$. 94.62 percent of the total variability of the original variables was explained by the first principal component.
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TIME SERIES DATA USED IN ESTIMATING THE CONSUMPTION FUNCTION.
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Definition and Sources.

\[
L = (L_H)(001) = \text{Aggregate labour supply of non-supervisory workers in all non-agricultural establishments measured in millions of man hours. } 001 = \text{Civilian labour force aged 16 years and over = sum of employed workers and unemployed workers. Source: Manpower Report of the President, 1972, table A-1, p.127.} \\
L_{HM} = \text{Average weekly hours of non-supervisory workers in all manufacturing industries. Source: As for variable } L_H. \\
L_{H1} = (L_{HM})(001) = \text{Aggregate labour supply of non-supervisory workers in all non-agricultural establishments as measured by average weekly hours in all manufacturing industries.} \\
L_p = \text{Female participation rate = Total civilian female labour force as a percentage of the total civilian non-institu-}

1. The marketing indices used in estimating the labour supply function are \(e, A, K_{ARM}, D\) and \(K_{ART}\). The time-series observations on these variables and their sources are given in Appendix B.

\[ W = 002/123 = \text{Average hourly earnings of non-supervisory workers in all non-agricultural establishments, measured in 1958 dollars.} \]
\[ 002 = \text{Average hourly earnings of non-supervisory workers in all non-agricultural establishments, measured in current dollars. Source: Manpower Report of the President, 1972, table C-3, p.191.} \]
\[ 123 = \text{Consumption deflator, 1958 = 100. Source: See Appendix B.} \]

\[ W_M = 003/123 = \text{Average hourly earnings of non-supervisory workers in all manufacturing industries, measured in 1958 dollars.} \]
\[ 003 = \text{Average hourly earnings of non-supervisory workers in all manufacturing industries, measured in current dollars. Source: As for variable 002.} \]

\[ N = \text{Total civilian non-institutional population aged 16 years and over, measured in millions: Source: As for variable 001.} \]

\[ W_R = 004/123 = \text{Average hourly earnings of non-supervisory workers in the retail trade sector, measured in 1958 dollars.} \]
\[ 004 = \text{Average hourly earnings of non-supervisory workers in the retail trade sector, measured in current dollars. Source: As for variable 002.} \]

\[ T = \text{Time-trend} = 1, 2, \ldots, t, \text{where} t = \text{total number of observations.} \]
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DATA AND DATA SOURCES OF VARIABLES USED IN ESTIMATING THE WAGE DETERMINATION FUNCTION.

Definition and Sources.

\( w_t \) = Average hourly earnings of non-supervisory workers in all manufacturing industries, measured in current dollars.  

\( p_t \) = Consumer price index for urban and clerical workers, 1967 = 100.  

\( u_t \) = Unemployment rate for all workers expressed as a percentage of the civilian labour force.  

\( r_t \) = \( \left( \frac{R_t}{E_t} \right) \times 100 \) = Percentage rate of profit.  

\( E_t \) = Stockholders equity for all manufacturing corporations, measured in billions of current dollars.  
Source: As for variable \( R_t \).

\( M_t \) = Index of Marketing.  

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1. The index of marketing used in estimating the wage determination function is \( M_{ART} \). This index is defined in appendix E.
\( n \) = Time trend variable defined as 1, 2, \ldots, \( t \), where \( t \) = total number of observations.

\( \Delta W_t = W_{t+1} - W_t \) = Absolute change in average hourly earnings of non-supervisory workers in the manufacturing sector.

\( \Delta P_t = P_{t+1} - P_t \) = Absolute change in the consumer price index.

\( \Delta U_t = U_{t+1} - U_t \) = Absolute change in the unemployment rate.

\( \Delta Pr_t = Pr_{t+1} - Pr_t \) = Absolute change in the percentage rate of profit.

\( \Delta M_t = M_{t+1} - M_t \) = Absolute change in the marketing index.
THE SERIES DATA USED IN ESTIMATING THE WAGE DETERMINATION FUNCTION.

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<th>Year</th>
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<th>$Pr_t$</th>
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* Not available.


Converse, Paul D. and Huyer, Harvey W. The Elements of Marketing. 3rd revised ed. Prentice-Hall, 1946.


