TOWARDS AN ECONOMIC THEORY OF THE APARTHEID STATE

by

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Towards an Economic Theory of the Apartheid State

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ABSTRACT

The use of economic tools to explain the emergence or evolution of social and political institutions has received new impetus and direction during the past two decades as a result of the emergence of Coasian microeconomics together with its accompanying theory of property rights allocation and the role of transactions costs. This thesis begins by identifying methodological individualism and a price theoretic orientation as characteristic features of the neoclassical economic approach to institutional change. The "new" economic history, modern public choice theory and economic theories of the state all have in common a concern with explaining the collective choice of institutions as an outcome of individual utility maximizing behaviour. Several different approaches to this problem are discussed, with a view to developing an economic theory of the South African apartheid polity.

Most existing analyses of apartheid have taken the institutional structure as given and have proceeded to demonstrate the (inefficient) allocative and (inequitable) distributional effects of the system. Apartheid is typically portrayed as an irrational response to a racist social environment. The purpose of this study, however, is to show how apartheid institutions may be treated as an endogenous product of rational individual choice. A simple general equilibrium model of the South African economy is augmented by a predatory theory of the state, in which a ruling group selects the level
of enforcement of apartheid policy. The latter is shown to depend upon the costs of administering, policing and defending the institutional system, in the face of both internal and external political opposition, as well as upon other exogenous variables such as the gold price and the occupational structure of the white electorate. The model yields testable qualitative predictions, although scarcity of data and problems of identification and specification search render testing difficult. Nevertheless it is shown how the dimensions and determinants of apartheid enforcement can be measured, and some preliminary quantitative analysis is undertaken. Detailed descriptions of the data, formal derivation of the model, and the legislative and institutional instruments of apartheid, are dealt with in appendices.
DEDICATION

To my parents and to Mark.
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I. METHODOLOGICAL FOUNDATIONS OF AN ECONOMIC THEORY OF SOCIAL AND POLITICAL INSTITUTIONS

1.1 Introduction

Neoclassical economics is often accused by its detractors of failing to provide an explanation of the processes of change in social institutions. More specifically, it is characterized as "ahistorical". Thus Hunt and Schwartz criticize neoclassical economists for their unquestioning acceptance of the existing socio-economic institutional structure and for displaying a total lack of historical perspective (1972, p. 8). In neoclassical models, the individual decision maker responds with dispassionate rationality to changes in his social and economic environment which, in turn, is regarded as exogenously determined. In Veblen's words:

(This) conception of man is that of a lightning calculator of pleasures and pains, who oscillates like a homogeneous globule of desire or happiness under the impulse of stimuli that shift him about the area but leave him intact. He has neither antecedent nor consequent (Hunt and Schwartz, 1972, p. 11).

Critics - whether institutionalists or Marxists - claim that initial endowments of wealth and political power, laws, conventions and "rules of the game" are not subject to explanation. According to Well, the purpose of neoclassical theory is to predict the consequences of maximizing behaviour.
But the institutional circumstances in which this behaviour takes place - what Marxists refer to as the "social relations of production" - are taken for granted (1979, p. 83). Thus neoclassical economics has nothing to say about how different distributions of wealth come about and how different distributions may be associated with different types of economic systems. In addition, neoclassical models "cannot describe the evolution and development of the institution of private property" (Nell, 1979, p. 78). Instead they are preoccupied with the efficient allocation of resources and ignore such issues as the effect of alternative distributions of power in society. This view derives directly from Marx's critique of classical political economy:

Political economy starts with the fact of private property, but it does not explain it to us. It expresses in general, abstract formulas the material process through which private property actually passes, and these formulas it then takes for laws. It does not comprehend these laws, i.e. it does not demonstrate how they arise from the very nature of private property. Political economy... takes for granted what it is supposed to explain" (Marx, 1972, pp. 101-102).

This alleged abstraction from underlying social and political institutions makes neoclassical theory into an historically relative set of hypotheses, and thus supposedly imparts a strong ideological bias in favour of existing institutions (Meek, 1967, pp. 196, 205).

But Marxists have not been the only critics to indict economics of a certain vacuity. American institutional thought, itself an offshoot of the German historical school and directly
descended from the work of Veblen, is characterized by a thorough dissatisfaction with formal neoclassical price theory and a mistrust of simplifying models of human behaviour (Kitch, 1983, pp. 169-170). Institutionalists such as John Commons, Wesley Mitchell, John M. Clark, Rexford Tugwell and Gardiner Means are united in their view of orthodox neoclassical economics as "a type of scientific thought which gives too much attention to the shape or form of its theorizing, and not enough consideration to the content of that theorizing and its relation to the real facts of economic life" (Gruchy, 1947, p. 21). The common intellectual orientation which distinguishes the American institutional school may be described as a belief in the holistic, evolutionary nature of the economic system. Holistic economics, according to Gruchy, abandons the particularistic individualism of neoclassical theory and replaces it with a conception of the individual as a social being whose behaviour is largely collective and habitual. Economic society is treated as a "connected system" of cultural patterns - a sort of cultural force-field - which is in a constant state of flux. The institutional economist rejects the notion of a "fundamental, pre-existing harmony of interests" and the fiction of a static, competitive economic society, both of which are attributed to neoclassical thought. He also adopts a social psychology in which the individual is conditioned by the ongoing social and cultural system that surrounds him, and human behaviour is guided by an "exploratory or experimental intelligence" rather
than a rational calculus of utility maximization (Gruchy, 1947, pp. 558-564). It is doubtful, however, whether the institutional or holistic school of economics has contributed much beyond a negative critique of the formalism and abstraction of neoclassical model-building, and has offered nothing in its place except a vague commitment to quantitative description (Kitch, 1983, pp. 170-172).

The modern institutional economist Andrew Schotter (1981) maintains that orthodox neoclassical economics is "an institutionally limited science": the only social or economic institutions that exist are markets of the competitive type in which all agents act parametrically and in isolation. This lack of institutional detail is regarded by Schotter as a serious weakness in the theory. In a tone reminiscent of Veblen, Schotter writes that the lack of a theory of institutions:

robs the model of any behavioral or strategic complexity or interest. The neoclassical agents are bores who merely calculate optimal activities at fixed parametric prices. They are limited to one and only one type of behavior - that of acting as automats in response to the (Walrasian) auctioneer. No syndicates or coalitions are formed, no cheating or lying is done, no threats are made - merely truthful parametric behavior (Schotter, 1981, p. 150).

However, we will attempt to show in this chapter and the next that this type of criticism involves a very narrow conception of neoclassical theory, and also ignores a large body of applied microeconomics as well as economic history which has appeared with increasing frequency over the past two decades. Specifically, we will indicate how the fundamental methodology
of neoclassical economics has been used to explain both existing social and political institutions and the evolution of these institutions over time. The scope of these applications has been limited neither to any particular historical epoch nor to any one class of phenomena. It will be seen that history and institutions do not necessarily fall outside the ambit of explanatory interest, and that it is possible to dispel many of the weaknesses which have been attributed to neoclassical economics as a putative theory of social interaction.

The extension of the scope of economics which has occurred in recent decades has been made possible by a number of related developments. We may identify one of these as the work of Ronald Coase and his followers in the economics of market externalities and property rights. This, in turn, gave rise to two distinct streams of research: one in the area of economic history and the other in what is traditionally known as "public choice". In both cases it became possible to talk about the relative efficiency of institutional forms and the reasons for their emergence or change. A second major departure which facilitated subsequent "imperialistic" intrusions of economic analysis into the preserves of other social sciences was the application of neoclassical methodology to the study of politics and the state. Finally, or more precisely in pari passu with these developments, was the renewed insistence by Stigler and Becker that the neoclassical method could be used quite fruitfully to explain phenomena which previously had been regarded as
explicitly "non-economic". Coase himself attributes the success of economists in extending the scope of their interests beyond the traditional subject matter of economics to the "generality" of the formal, technical methods which have become increasingly characteristic of economic analysis and which are readily applicable to all social systems (1978, p. 207).

The remainder of this chapter will be devoted to a discussion of those methodological features of modern neoclassical theory which facilitate its extension into an economic theory of social and political institutions and institutional change. In the next chapter we will review the economic literature on institutional change, history and politics in order to provide a basis for constructing a neoclassical model of the South African polity in chapter 4.

1.2 The Economic Method

According to Robert Seidman, the simplest and most general model of mankind "is one of an aggregate of people exercizing choices while influenced by certain constraints and incentives" (1973, p. 569). The fundamental behavioural premise upon which neoclassical economics is grounded is the proposition that individuals act so as to purposefully maximize their expected utility subject to constraints, given stable preferences (Becker, 1976, p. 282; Alchian, 1977, p. 138). In other words, any observed change in behaviour is assumed to be induced not by a change in tastes but by a change in objective constraints.
This is not because the neoclassical theorist has any a priori grounds for believing that changes in tastes do not occur or are unimportant determinants of behaviour. Rather it is due to the fact that he is able to observe and account for changes in objective constraints whereas he is not equipped with the tools to do the same for subjective preferences. A theory of constrained utility maximization with fixed preferences constitutes a potentially operational model of human behaviour. (Becker, 1976, p. 133). As Becker points out:

The assumption of stable preferences provides a stable foundation for generating predictions about responses to various changes, and prevents the analyst from succumbing to the temptation of simply postulating the required shift in preferences to "explain" all apparent contradictions to his predictions (1976, p. 5).

The use of relative price and income constraints as the determining variables which drive behavioral responses has the effect of producing testable propositions. This is because all changes in behaviour are then explained by changes in prices and incomes, which are precisely the variables that organize and give power to economic analysis (Stigler and Becker, 1977, p. 89).

The method of neoclassical economics thus consists of the development of hypotheses about social behaviour from models of individual purposive behaviour. According to Roland, neoclassical economics is founded upon "psychologistic individualism", which means that all explanation proceeds from an "irreducible minimum" set of exogenous givens. These exogenous variables consist exclusively of natural conditions.
(e.g. weather, contents of the Universe, etc.) and the psychological states of the individual agents. The psychologistic individualism of neoclassical theory implies that "everything or every variable which cannot be reduced either to someone's psychological state or to a natural given must be explained somewhere in the theory" (Boland, 1982, p. 30). The primary unit of analysis is the individual who is the agent of choice, and who is assumed to behave rationally. That is, the individual chooses among a number of alternatives in a manner which is both consistent and transitive. This methodological individualism of neoclassical economics has been singled out by its critics as the root cause of its atomistic and ahistorical preoccupation with static choice problems and its consequent failure to account for the underlying institutions which must condition any choice. While it is true that the economic method is "atomistic", in the sense that it focuses attention on the individual as the unit of analysis, we will see that this does not preclude the possibility of an economic theory of institutional change.

The principle of substitution, which is the basic theorem of neoclassical economics, emerges deductively from the hypothesis that rational individuals make choices in such a way as to maximize a stable utility function. In other words, if the cost of any one action is reduced relative to the costs of alternative actions, the individual will choose more of the former and less of the latter. A "cost" in this sense refers to
the best possible opportunity which is foregone as a result of selecting one good or activity in preference to all others (Alchian, 1977, p. 303). In fact, Becker has shown that the principle of substitution does not require rational maximizing behaviour on the part of individual agents. Even the assumption that people behave in a completely random fashion will not destroy the principle of substitution. This is true because changing prices or incomes alter the real opportunity sets faced by individuals and so "force" behaviour which in aggregate is indistinguishable from rationality. An income-compensated increase in the price of one commodity shifts consumption opportunities towards another on average, even if consumers behave perversely or impulsively (Becker, 1962, p. 4). Nevertheless we will retain the stronger assumption of rationality (utility maximization) throughout this essay, in order to demonstrate that it is still possible to account for the existence of certain institutions which have traditionally been classed as "irrational" because of their evident economic inefficiency.

1.3 Coasian Microeconomics: the Theory of Property Rights and Transactions Costs

The hypothesis of constrained utility maximization leads to the proposition that rational individuals will always seek to exploit any possible gains from exchange, providing that the costs of doing so do not outweigh the benefits. Ronald Coase was
one of the first to draw attention to the broad applicability and the wide range of implications which flow from this powerful theorem. Coase showed that if the market mechanism works without costs of transacting or negotiating between parties, then all externalities will be eliminated so as to maximize the value of the social product, irrespective of the initial delimitation of property rights (Coase, 1960, p. 8; Demsetz, 1964, p. 12; Demsetz, 1966, p. 63). An externality is simply a harmful or beneficial effect which impinges upon an economic agent but for which he is not compensated or rewarded by means of a market exchange. In Coasian terms, the existence of an externality implies that there are unexploited gains from exchange. If the transactions costs involved in exploiting these gains exceed the gains themselves, then the initial assignment of property rights will have an effect on the allocation of resources and the total value or mix of production (Coase, 1960, p. 16; Demsetz, 1975, p. 169). However, in the absence of transactions costs, the composition of output is independent of the structure of property rights except insofar as changes in the distribution of wealth affect demand patterns (Furubotn and Pejovich, 1972, p. 1143).

At this point it is appropriate to digress briefly to some key definitional issues. Furubotn and Pejovich point out that "property rights do not refer to relations between men and things but, rather, to the sanctioned behavioral relations among men that arise from the existence of things and pertain to their
use" (1972, p. 1139). The central problematic for any theory of property rights is to show that the content of these rights affects the allocation and use of resources in specific and predictable ways. Trade and production involve contractual relationships which exist not so much to accomplish the exchange of goods and services, but to permit the exchange of "bundles" of rights over those goods and services. These contractual arrangements often take the form of prescriptive rules which effectively constrain the decisions and behaviour of private individuals, but which themselves may be the product of conscious social choice on the part of legislators or others responsible for the design of statutory regulations (Vining, 1962, pp. 167, 184). Once the terms of a particular type of transaction are sufficiently entrenched as to constitute a set of accepted rules of behaviour, the specific rights conveyed by those rules become themselves objects of transaction between individuals. The value of the exchange depends crucially on the nature and extent of the rights which are being traded (Demsetz, 1964, p. 17). The right of ownership in an asset consists of the right to use it, to change its form or substance, and the right to (partially or fully) transfer the ownership claim itself. Any one or more of these components of a property right may be attenuated to some degree, and this obviously affects its value. A private property system means that individuals have exclusive control over the use to which scarce resources can be put and that this right of control and use is transferable or salable.
Privately owned resources will always tend to be allocated to their highest valued use, provided that the costs of achieving such an optimal allocation (the costs of trading rights) do not exceed the gains. If transactions costs are sufficiently high, exchange in rights among owners can have allocative effects due to the positive costs of effecting the exchange (Alchian and Demsetz, 1973, p. 22).

According to Demsetz, "a primary function of property rights is that of guiding incentives to achieve a greater internalization of externalities" (1967, p. 348). The Pigouvian concept of "externality" implies that there exists some deviation from an attainable optimum due to a divergence between private and social costs. The significance of Coasian analysis is that it focuses attention specifically on the transactions costs that prevent individuals from bargaining in such a way as to internalize all the effects of their private activities, and thus serves to demonstrate that the concept of "externality" is purely normative and has no positive analytical substance (Dahlman, 1979). A contract consists of a transfer of property rights in one form or another. These transfers, and the associated coordination of inputs of various factors of production, are costly events. The choice of a contractual arrangement is made so as to maximize the gains derived from the contract subject to the transactions costs involved in the process of contracting (Cheung, 1969, pp. 52-64).
Transactions costs may be defined as the costs involved in ordering economic activity, and thus include the costs of entering into the act of trading (Posner, 1977, p. 289; Breton, 1974, p. 3). If we regard an exchange as a productive activity requiring the input of certain resources in a specified technological relationship, then we can simply assume that a fixed proportion of whatever is being traded disappears in the course of the transaction itself. In other words, we may formally treat transactions costs as analogous to transportation costs or any other variable production cost. However, in addition to this type of transactions cost, there may be fixed setup costs associated with each exchange, and, even more difficult to measure, a whole range of costs incurred in bringing the trading parties together (search costs), informing each other of the existing exchange opportunities, and deciding how best to exploit these opportunities (information and decision costs). The costs of obtaining information about the attributes of traded commodities is itself dependent upon the problems and costs involved in measurement. The detection of measurement errors is a necessary and important component of most contractual arrangements. Barzel shows that the existence of positive measurement costs can produce such institutional devices as product warranties, share contracts and brand names, even in the absence of risk aversion on the part of the contracting parties (1982, pp. 32-37). It is also necessary to take into account the actual costs of bargaining between the
parties involved, and then after the trade has been concluded there remain costs of enforcing, policing and monitoring the resulting contractual obligations (Dahlman, 1979, p. 149). Policing or enforcement costs alone are an extremely significant dimension of transactions costs, because enforcement is an important aspect of any property rights system (Alchian, 1977, p. 130).

The value of what is being traded depends crucially on the rights of action over the physical commodity and on how economically these rights are enforced (Demsetz, 1964, p. 17).

A property right is nothing more than the expectation of an individual that his decision about the uses of certain resources will be effective. It follows that ownership rights to property can exist only as long as other people agree to respect them, or as long as the owner can forcibly exclude those who do not agree (Umbeck, 1981, pp. 38-39). All property rights are therefore ultimately based on the ability of individuals or groups to maintain exclusivity. The enforcement of rights to particular resources has a vital impact on the ability of prices to measure benefits: the absence of property rights enforcement means that prices, which reflect private benefits, fail to measure the full social benefits derived from the traded goods.

While many transactions costs - both the ex ante costs of search, decision and bargaining, and the ex post costs of monitoring, policing and enforcing - may be treated simply as different categories of information or measurement costs (Dahlman, 1979, p. 148), there are some types of transactions
costs which cannot be conceptually reduced in this manner. This is especially true if there are aspects of bilateral monopoly and Ricardian rents to be divided between the negotiating parties. In this case there will be components of the costs of bargaining, as well as the costs of monitoring the compliance of contracting parties with the terms of the contract, which exist over and above the pure costs of information and measurement (Alchian, Crawford and Klein, 1978, p. 300). Legal restraints and prohibitions on the use and exchange of resources can be viewed as effectively imposing infinitely high transactions costs upon that exchange, thus rendering it prohibitively expensive (Furubotn and Pejovich, 1972, p. 1146; Alchian and Demsetz, 1973, p. 21).

Economic efficiency in exchange requires not only the fulfilment of the familiar set of marginal equalities, but also the use of the lowest cost legal technology or configuration of property rights (Crocker, 1971, p. 464). If the expected

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*I am grateful to Professor T. E. Borcherding for drawing this to my attention. A similar point is made by Posner who contends that a small number of parties to a transaction is no guarantee of low transactions costs when elements of bilateral monopoly are present - i.e. if neither party has a good alternative to dealing with the other. Transactions costs are likely to be highest when bilateral monopoly coincides with a large number of parties on both sides (Posner, 1977, p. 45). In fact, monopoly power may be pervasive even in the absence of entry restrictions or highly concentrated supply. For example, incentives for post-contract opportunistic behaviour can arise out of the existence of specialized assets and appropriable quasi-rents. "There may be many potential suppliers of a particular asset to a particular user but once the investment in the asset is made, the asset may be so specialized to a particular user that monopoly or monopsony market power, or both, is created" (Alchian, Crawford and Klein, 1978, p. 299).
benefits from an exchange of property rights exceed the expected transactions costs, it would be possible for the legal or political system to achieve a Pareto-improvement in the allocation of resources by assigning property rights in such a way as to place liability on the party most cheaply able to avoid the costly interaction (Demsetz, 1975, p. 182). In other words, efficiency is served by assigning rights de novo in such a way as to minimize the costs of transacting that would otherwise be incurred subsequently. This in turn is achieved by assigning new rights initially to those who potentially have the strongest incentive to purchase them, thus economizing on transactions costs.

Perhaps the most significant contribution of Coasian property rights theory is the insight that, in a world of positive transactions costs, the value of realigning resources and, more importantly, rights over those resources, should equal the costs of transacting. Thus some external effects, both harmful and beneficial, may still be consistent with economic efficiency (Demsetz, 1968, p. 34). Coasian theory treats positive transactions costs as a reality, and dispenses with the "Nirvana approach" of pre-Coasian welfare economics which regarded the best of all possible (attainable) worlds as one in which all externalities are fully internalized. Appreciating this fallacy as early as 1959, Arrow writes:

Any method of resource allocation requires a process for equating supply and demand (or some equivalent), and such a process may be in itself costly, though such costs are not considered in the usual formal analysis of
welfare economics (Arrow, 1959, p. 50).

It is not surprising that the Coasian recognition of the role of positive transactions costs and the consequent allocative implications of alternative property rights structures should provide the foundations for an economic theory of institutions within the neoclassical paradigm. In Carl Dahlman's words:

The Coase approach...directs attention to the point that institutions fulfil an economic function by reducing transaction costs and therefore ought to be treated as variables determined inside the economic scheme of things. The question then ultimately becomes: how can the economic organization be improved upon by endogenous institutional arrangements?... Coase opens the door for an economic theory of institutions (Dahlman, 1979, pp. 161-162, emphasis added).

Dahlman admits that, in a general equilibrium sense, this type of approach yields the somewhat unpalatable conclusion that "if it exists it must be optimal, and if it does not exist it is because it is too costly; so that is optimal too" (1979, p. 153). However he attributes this to the fact that, as we have seen, Coasian theory renders the concept of an "externality" totally normative. Pre-Coasian welfare economists maintained that the existence of an externality or "side-effect", and the resulting absence of the required equalities of marginal rates of substitution and transformation, necessarily implied that the economy was operating inefficiently. But this traditional view failed to take into account that the provision of a market for the side-effect, or some alternative political mechanism for internalizing the externality, is itself a valuable and costly service. If this service is not being produced, inequalities between certain marginal rates of substitution and
transformation may in fact be consistent with efficiency, as will be the case if the cost of taking account of side-effects through either the market or the polity exceeds the value of realigning resource rights (Demsetz, 1964, pp. 13-14). Thus there exist no qualitative differences between "side-effects" or externalities and "primary effects". The only differences are those implicitly based on quantitative differences in transactions costs (Ibid., p. 25). Once transactions costs are recognized as relevant constraints in the process of trade, all existing side-effects are internalized to a degree that is optimal by definition. The important point for our present purpose is that this (almost tautological) property of Coasian theory does not detract from the crucial role played by transactions costs in determining the form of existing institutional arrangements as well as the types of rules, regulations and decision mechanisms that societies adopt. Recognition of the importance of positive transactions costs in affecting the allocation of rights over resources is therefore vital to any neoclassical theory of politics or the state (Breton, 1974, p. 9).

(1.4) The Economic Theory of Non-Market Behaviour

The concept of transactions costs, combined with that of utility maximization, has indeed facilitated a neoclassical theory of institutions and institutional change. Stigler and Becker (1977) have attempted to show that changes in behaviour
which appear to have no rational basis can be explained on the assumption of stable, well-behaved preference functions and that this approach is the most fruitful in terms of the generality of its applicability and the testable nature of its predictions. Behaviour which otherwise may be characterized as irrational, volatile or as determined by culture or tradition is given an economic explanation by invoking the analytical device of positive transactions costs. When economic agents are observed not to exploit all profitable opportunities or gains from trade, the utility maximization hypothesis may appear at first glance to be violated. However, as we have seen in the previous section, the neoclassical method postulates the existence of costs (both pecuniary and psychic) of taking advantage of these opportunities which may be sufficiently large as to eliminate their profitability altogether.

Becker (1976) agrees with Dahlman that, by asserting the existence of such transactions costs, the "economic approach" to human behaviour is rendered into an almost tautologically closed system. Any divergence from a Pareto-optimal equilibrium is accounted for by positive transactions costs which make the attainment of such an equilibrium too costly to be profitable. Becker draws an analogy between the Panglossian role of transactions costs in the neoclassical paradigm and the positing of (sometimes unobserved) uses of energy which serves to "close" or "complete" the energy system and thereby vindicate the law of the conservation of energy.
The critical question is whether a system is completed in a useful way; the important theorems derived from the economic approach indicate that it has been completed in a way that yields much more than a bundle of empty tautologies in good part because...the assumption of stable preferences provides a foundation for predicting the responses to various changes (Becker, 1976, p. 7).

Utility, as opposed to wealth, maximization is a vital prerequisite for an "economic" theory of non-market phenomena, and as such, it is utility (not wealth) maximization which provides the basis for what Becker refers to as the "economic approach" to human behaviour. Thus, according to Alchian (1977), the proposition that an individual seeks to maximize his utility simply means that he makes consistent choices - i.e. that he behaves "rationally". In order to use this postulate as an analytical tool, we must specify the arguments in the utility function. One of these arguments may be pecuniary wealth, but the individual should be able to substitute between this and other sources of utility which may be of a less tangible nature. The utility maximizing "economic approach" to behavioural explanation is exemplified in Becker's so-called "new theory of consumer choice", according to which the consumer is viewed as "producing" certain non-marketable commodities (nourishment, warmth, health, etc.) by combining purchased market goods and services with household time. It is these non-marketable commodities that provide utility to the consumer, and changes in their relative shadow prices produce changes in consumer behaviour which would not be explicable as anything other than a change in tastes if wealth maximization were the only criterion of choice (Becker, 1976, p. 136; Stigler and Becker, 1977, p.
Similarly, Alchian points out that wealth maximization is not adequate to explain the behaviour of the firm when viewed (in the Coasian sense) as an organizational device designed to economize on various transactions costs (1977, pp. 243-244). It is the assumption of utility maximization, and appropriate construction of individual utility functions, that has facilitated economic explanations of such diverse (and apparently "irrational") phenomena as altruism, discrimination, addiction, fashions and fads, and customs and traditions (Becker, 1976; Stigler and Becker, 1977). According to Posner, the application of the economic method to explain non-market interactions, although recently revived by the "Chicago School", has earlier precedents in the work of Sidgwick and Mitchell, and the theme of this literature may justifiably be regarded as nothing less than a redefinition of economics as the study of rational choice per se (1981, p. 3). In Coase's view, such a broad definition of economics as the study of all purposeful human behaviour has rendered its boundaries coterminous with many "contiguous disciplines" (1978, p. 207).

In the next chapter we will see how the tools of neoclassical economics have been extended to explain political institutions and institutional change. Chapter 3 will survey the literature on apartheid and race discrimination, and an economic model of the South African apartheid state is developed in chapter 4. Various empirical implications of this model are examined in chapter 5, while chapter 6 concludes with an
assessment of the significance of the approach suggested in this thesis for the current literature on South Africa.
II. ECONOMIC APPROACHES TO HISTORY, POLITICS AND THE STATE

(2.1) The Neoclassical Theory of Institutional Change and the 'New' Economic History

The application of the neoclassical method to explanation of institutional change involves a direct extension of the theory of property rights, together with the individual maximization hypothesis, to the analysis of contractual forms. Constraints which in more traditional models are regarded as exogenous are now effectively endogenized. The result is a characteristically materialist conception of history, in which endogenous changes in social and political institutions are produced by shifts in economic and technological (or natural) constraints. In a passage that sounds almost reminiscent of Marx, Alfred Conrad contends that:

History passes through homo faber, and the production and transformation of laws, customs, beliefs, styles of civilization, even the content of consciousness—all these are mutually penetrating and fully reciprocal (Fogel and Engerman, 1974, vol. 1, p. 14).

However, the Marxist dialectic is essentially an "organic" conception of social change, whereas the methodological individualism of neoclassical economics focuses attention upon marginal variations in institutional forms, induced by changes in the objective constraints which impinge upon the individual economic agents and thereby drive the entire system (Buchanan
and Tullock, 1965, pp. 318-319). In fact, Boland defines an institution precisely as a constraint, the establishment of which requires the implicit or explicit participation of many individuals. The psychologistic individualism of the neoclassical method (see section 1.2) prescribes that all institutions be endogenously explained:

What makes institutional constraints important is that they are not naturally given but have themselves been created by other individuals acting in concert (Boland, 1982, p. 57).

According to Schotter, this approach derives from Menger's view of institutions as arising out of the selfish interactions of a myriad individual economic agents:

Just as Adam Smith's invisible hand can, in a decentralized fashion, lead economic agents to reach a Pareto-optimal competitive equilibrium, it can also lead them to create social institutions that will facilitate their interaction when competitive outcomes are not optimal (Schotter, 1981, p. 4).

Economics is thus effectively redefined as "the study of how individual economic agents pursuing their own selfish ends evolve institutions as a means to satisfy them" (Ibid., p. 5).

In many naive neoclassical models, the institutional structure is taken as given (Goldberg, 1974, p. 465). An economic explanation of the provenance and change of institutions must start from an analysis of the determinants of property rights structures and contractual forms. Underlying every transaction is some form of contract, the terms of which specify the distribution of income among participants and the conditions of resource use. Since any transaction involves an
outright or partial transfer of property rights which is defined by a contract, a theory of contracts must, by its very nature, be concerned with the structure, organization, transfer and enforcement of property rights (North and Thomas, 1971, p. 793). "The contract may be formal or informal, expressed or implied, written or unwritten" (Reed and Anderson, 1973, p. 135), but the important point is that, in order for the contractual form to be stable through time, the terms of the contract must continue to reflect the economic value of the resources (or rights over resources) transacted through the contract. Any change in the real value of property rights will set up incentives for revision to existing contracts that in turn will ultimately be translated into fully-fledged institutional change.

The individual economic agent remains the basic unit of analysis in the sense that it is the individual's purposive maximizing behaviour that motivates change. The same marginal calculus of costs and benefits applies to institutional or contractual innovation as to more familiar adjustments in the behaviour of firms and households. In both cases, the hypothesis of individual utility maximization is invoked by specifying functional relationships and the relevant shift parameters in order to facilitate testable predictions (Anderson and Hill, 1975, p. 165). Thus changes in property rights assignments are endogenously determined by changes in the ratio of costs to benefits of particular property rights specifications (Pejovich, 1972, pp. 313-314). For example, Anderson and Hill identify the
marginal cost and marginal benefit of different levels of resources devoted by utility maximizing agents to property rights definition and enforcement activity. The benefit from increasing levels of such activity accrues because of the increased probability of appropriating the full value of the asset or resource in question. This benefit is assumed to increase at a decreasing rate, thus resulting in a downward-sloping marginal benefit schedule. The marginal cost of property rights enforcement and definition activity rises because of the postulated rise in the opportunity costs of the necessary resources. The intersection of these two schedules defines the existing structure of property rights and any parametric shifts will induce changes in this structure. For instance, a rise in the price of resources, and hence in the value of rights to those resources, will also increase the return on resources devoted to the definition and enforcement of those rights. This in turn will cause a rightward shift in the marginal benefit curve. Similarly, any increase in the probability of loss of an asset (e.g. due to an increased threat of expropriation or theft), will raise the productivity of definition and enforcement activity. The marginal cost of this activity will shift in accordance with changes in the parameters of the relevant production function. A technological innovation in the production of enforcement activity, or a decline in the costs of inputs to enforcement or definition, will shift the marginal cost curve in a downward direction (Anderson and Hill,
Victor Goldberg uses a similar type of model to explain the varying amounts of effort that will be applied by utility maximizing agents to achieving changes in political institutions through lobbying, persuasion, bribery and other means of exerting political influence. According to Goldberg, the optimal level of political activity is attained when the expected marginal benefit of the last dollar spent on influencing institutions in any particular area of interest is equal to that of the last dollar spent on any other good (1974, p. 465). The real resource cost of engaging in influencing activity will be higher to any one individual or group if others are simultaneously attempting to achieve changes in the opposite direction, and this interdependence among individuals must be reflected in the specification of the cost and benefit functions. This process results in institutional or contractual adjustments to changes in technology or relative prices which generally yield more efficient configurations of property rights, although it is also possible for some individuals to gain at the expense of others (especially if positive transactions costs inhibit bargaining or acquisition of information).

Goldberg's analysis suggests that much of the impetus for institutional change derives from rent-seeking activity. The term "rent-seeking" was first coined by Anne Krueger to refer to the response of utility maximizing agents to profit
opportunities created by the political system (Krueger, 1980, p. 52; Buchanan, 1978, p. 13; Kitch, 1983, p. 210). Legislation, regulation, monopolies, state charters, tariffs, quotas and taxes all provide such profit opportunities, and resources are invested in capturing these profits according to the same criteria which guide more traditional forms of investment (Breton, 1964, p. 376). Specifically, since individuals invest resources across possible alternatives until the expected returns are equalized, one would expect the return on resources invested in influencing legislators to be about equal to the return on other types of investment. The resources invested in this rent-seeking activity represent a welfare loss to society considerably in excess of the usual welfare triangle (Krueger, 1980, p. 57; Tullock, 1967a; Tullock, 1982, p. 337). Such "strategic behaviour" or bargaining does not characterize truly competitive market situations, which are wholly "impersonal" in operation (because of the existence of extremely close substitutes). Rather, political or social bargaining in order to obtain the rents accruing to individuals from the redistributive activities of the state has more in common with bilateral monopoly than a competitive market, and the incentive to invest resources in such strategic behaviour or rent-seeking is correspondingly greater (Buchanan and Tullock, 1965, p. 103). In fact, a sizeable proportion of the rents to which access is sought may be dissipated by the resource costs of rent-seeking itself.
The extent of rent-seeking is a positive function of the size of the potential rent opportunities (Buchanan, 1978, p. 14). For example, interest group activity, measured in terms of organizational costs, is a direct function of the "profits" expected from the political process (Buchanan and Tullock, 1965, p. 286). However, the return on resources invested in rent-seeking is usually a "public good", in the sense that it is shared by a large number of beneficiaries, with the result that the attendant free-rider problem may actually inhibit investment in rent-seeking (especially when the number of beneficiaries is so large that bargaining and coordination is extremely costly) (Olson, 1965, pp. 22-36). It can also prove costly, however, for a firm or an individual to refrain from contributing towards collective rent-seeking activity. For example, the scale on which such collective action is pursued will probably be reduced if fewer potential beneficiaries participate. Thus, according to Stigler, the more diverse and asymmetric the interests of the individual beneficiaries, the more likely that the free-rider problem will be overcome and the collective action initiated (1974, pp. 359, 362).¹ There can be no doubt that the

¹Furthermore, Becker has shown that the effectiveness of a group's rent-seeking activities is mainly determined not by its absolute efficiency - eg. its absolute skill at controlling free-riding - but by its efficiency relative to that of other groups. In addition, economies of scale are likely to be important at low levels of expenditure on rent-seeking, and since free-riding is more easily controlled in small groups, a modest increase in the size of a small group would usually raise the marginal product of its expenditure on rent-seeking because the benefit from larger scale would exceed the cost from greater free-riding (Becker, 1983, p. 380).
rent-seeking which is undertaken does constitute an important determinant of institutional change (despite the free-rider problem, to which we will return periodically throughout this chapter), because institutions, contractual forms and "rules of the game" are themselves significant sources of economic rents. As Goldberg points out, individuals or groups will generally strive to have their affairs governed by rules that reward the resources with which they are relatively well endowed. In Goldberg's words:

"Why would an organization that is actively seeking profits within the rules of the game not seek further profits by altering the rules of the game as well...? (1974, p. 479)."

The economic theory of institutional change has constituted a key input into what has come to be known as the "new" economic history. The other characteristic component of this "new" history is the cliometric revolution - i.e., the application of quantitative methods (especially the systematic analysis of statistical data) to historical problems (Fogel and Engerman, 1971, 1974). Various theoretical problems and controversies associated with the "new" economic history are dealt with in appendix 1. We will now focus attention exclusively upon the role of economic history as an experimental laboratory for the economic theory of institutional change.

Without a theory of institutional innovation, "history is limited to narration, classification and description" (Davis and North, 1970, p. 132). The "new" economic historians have therefore devoted themselves to the task of explaining past
events on the basis of individual rational behaviour - i.e. combining economic theory with history (Davis and North, 1970, p. 131; Anderson and Hill, 1975, p. 163). Most work in this area therefore involves explanation of changes in property rights structures or contractual forms. Economic growth or development requires efficient economic organization as a prerequisite. This in turn necessitates the establishment of institutional arrangements and property rights that create an incentive to channel individual economic effort into the activities that bring the private rate of return closer to the social rate of return. A discrepancy between private and social benefits or costs occurs whenever property rights are poorly defined or inadequately enforced. Various factors may have inhibited the evolution of "efficient" property rights systems at various points in history. For example, the costs of creating and enforcing property rights may have exceeded the benefits to certain groups or individuals, or the technology necessary to overcome the free-rider problem associated with certain types of collective action may not have been available. Much of the "new" economic history is concerned with identifying the relevant obstacles to growth or innovation and analyzing the manner in which they were circumscribed (North and Thomas, 1973, pp. 1-9).

An influential contribution to this literature is North and Thomas' explanation of the medieval manorial system (1971). They regard such contractual systems as labour-dues as constituting "secondary institutional arrangements", which in turn are
located within a broader set of "primary institutional arrangements" (the fundamental rules of society). Secondary institutional arrangements are constrained by the primary framework, but over a long period of time, a cumulative set of changes can ultimately amount to a change in primary institutions which would have been too costly to achieve in one fell swoop (North and Thomas, 1971, p. 786). North and Thomas proceed to trace the evolution of medieval European property rights, especially the system of labour-dues and its ultimate replacement by fixed rent contracts. In the early stages of this evolution, they hypothesize that the general absence of any market for goods, combined with the existence of a rudimentary market for labour, justified the sharing of inputs (labour-dues) as the contractual arrangement having the lowest transactions costs. Pressure for institutional change was created by a rise in the level of population, which increased the gains from specialization and trade, and consequently resulted in the development of a goods market. This in turn made it possible to negotiate and specify the peasants' consumption bundle in money terms, so that the relative advantage of labour-dues contracts as devices for economizing on transactions costs was eliminated (especially as high monitoring and enforcement costs were associated with such contracts). However, as land became more scarce in the thirteenth century, the trend towards fixed rent contracts was reversed as landlords adjusted to the rise in the real value of land by choosing to farm it themselves. The
decline in the population which began in the fourteenth century caused rents to be reduced considerably as landlords competed for scarce tenant labour, and life-long leases were gradually substituted for rental contracts. Using the same kind of approach, Reed and Anderson (1973) show that rapid price inflation, beginning in the late twelfth century, together with rising population, caused English landlords to abandon the practice of leasing their desmesnes and to become agricultural entrepreneurs instead.

One of the most fully developed theories of institutional change which has been applied to historical explanation is that of Davis and North (1970). Their model is one of "lagged supply", in which a change in the potential profits from institutional innovation induces, after some delay (or lag), the innovation of a new arrangement capable of capturing those profits for the innovators. Pressure for institutional innovation could be initiated by any of three types of exogenous events: (i) Potential income from a change in institutional structure may increase due to the emergence of a new externality, a shift in transactions costs, or the application of a new technology could result in scale economies which produce rents that various individuals or groups may attempt to capture. (ii) The costs of organizing or operating a new institution could change because of the invention of a new arrangemental technology, or because of a change in the relative prices of factors used as inputs into a new or competing
institution. (iii) A legal or political change may alter the economic environment, thereby making it possible for some group to effect a redistribution or take advantage of an existing external profit opportunity.

Davis and North point out that institutional innovation can result in a net increase in social product if, for example, there is a reduction in some transactions or information costs which leads to a Pareto-improvement. However, it could also produce a net transfer of income to those who are able to appropriate the rents produced by the new institution. The theory of rent-seeking leads us to expect that these are likely to be the very same groups of individuals who were instrumental in bringing about the institutional change in the first place. Davis and North refer to these beneficiaries as "institutional innovators" or "primary action groups". It is through their rent-seeking responses to potential profit opportunities that institutional change is effected. They consider alternative institutional forms in much the same way as a business firm considers the choice between alternative investments. Only those costs borne by the primary action group and those revenues accruing to its members are relevant to the investment decision. Transactions costs, and especially the costs of information in the face of uncertainty, are particularly important inputs into the calculus of the institutional innovators or rent-seekers. As Davis and North point out:

In the absence of an adequate information network (and other things being equal) the discounts that
entrepreneurs put on potential income because of the uncertainty tend to be higher the further the potential buyer is (either in time or space) from the location of the transaction (1970, p. 137).

If these uncertainty discounts are sufficiently high, the innovation may not take place at all. Davis and North's theory predicts that the lag between a perceived profit opportunity and the corresponding innovation will be shorter the greater are the number of alternative technologies that may be borrowed or modified, the more solidly are economic institutions based on the legal and political environment, the larger the number of existing arrangements that can provide the basis for further institutional extensions, and the greater and more certain are the potential returns (Davis and North, 1970, p. 141).²

²The work of Goldberg, as well as that of economic historians such as Anderson and Hill, and Davis and North, may be characterized as falling under the general rubric of "neo-institutionalism", which eschews models based upon the fiction of zero transactions costs and ideal markets, or upon the tautological definition of transactions costs in such a way that all institutions are necessarily "efficient". Instead, the neo-institutionalist school focuses directly on transactions costs considerations in an attempt to explain the choice between alternative modes of organizing production, and interprets institutions and their evolution as arising from attempts to economize on transactions costs. Burrows and Veljanovski (1981) regard the "neo-institutionalist" methodology as microanalytical, in the sense that it concentrates attention on the details of the environment in which transactions take place, and it suggests an empirical approach that requires the collection of data on individual transactions rather than quantitative aggregates. "It is therefore process-orientated, dynamic, tends to be evolutionary, and seeks to identify the principal factors that have been responsible for institutional development. Stated somewhat differently it rejects (market) equilibrium analysis and instead places emphasis on the adaption to disequilibrium, hypothesizing that 'inefficiency' gives rise to adaptive efforts to minimize costs" (Burrows and Veljanovski, 1981, p. 23). Neo-institutionalist theory uses the concept of efficiency to mean "procedural efficiency" in adjusting to an uncertain and changing environment. There is no necessary commitment to market solutions and persuasive economic reasons.
We will show in chapter 4 how economic models of historical change can provide important insights into our understanding of the emergence and evolution of the apartheid state. We now proceed to discuss another important dimension of the economic approach to the analysis of institutions - namely, the various theories of politics and the state that have emerged over the past two decades.

(2.2) Economic Theories of Politics and the State

(2.2.1) Introduction

According to Platonic realist social philosophy, there exists an objective "social good" defined independently of individual desires. This social good can only be apprehended by methods of philosophic inquiry or introspection which justify government by the elite, secular, religious, or some omniscient and beneficent "philosopher-king". In contrast to this Platonic ideal stands the utilitarian philosophy of Jeremy Bentham which seeks to ground the social good upon the good of individuals (Arrow, 1963, p. 22).

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*May in fact be provided as to why certain activities should be sheltered from market forces. This approach does not assert that particular institutions or laws are efficient, but only "attempts to identify the efficiency attributes of various institutional arrangements, and to hypothesize that there is a tendency for institutions to evolve to exploit opportunities for improving the efficiency with which market and non-market goals are pursued" (Burrows and Veljanovski, 1981, p. 25).
The hedonist psychology associated with utilitarian philosophy was further used to imply that each individual's good was identical with his desires. Hence, the social good was in some sense to be a composite of the desires of individuals (Ibid., pp. 22-23).

The Platonic conception of the state is essentially "organic", in the sense that the preferences of individuals are subordinate to the goals of the state as a collective entity (Buchanan and Tullock, 1965, p. 11; Niskanen, 1971, p. 4). However, the neoclassical theory of the state, with its roots in Benthamite utilitarianism, represents a set of hypotheses about social behaviour which are developed from models of individual purposive behaviour. The choice-theoretic orientation of the neoclassical method places the individual agent - whether he be consumer, entrepreneur, politician, citizen or bureaucrat - at the centre of the stage, instead of treating him as a merely passive role-player within an organic society (Ombeck, 1980, p. 4). The methodological individualism of neoclassical economics characterizes the behaviour of the state or collectivity as "the action of individuals when they choose to accomplish purposes collectively rather than individually..." (Buchanan and Tullock, 1965, p. 13). According to this approach, it is not permissible to make value judgements regarding the virtues of particular political arrangements, since governmental and political institutions are not to be interpreted as devices or mechanisms for finding the independently "best" or "optimal" answers to problems that arise (Brennan and Buchanan, 1980, p. 14). The monistic concept of the government as a unitary economic subject is replaced by a pluralistic theory in which a set of individual
"suppliers" produces social goods for a set of individual "buyers" who value these goods on their individual merits (Van den Doel, 1979, p. 6).

We may trace a direct line of descent from classical writers such as Smith, Bentham, J. S. Mill and Knut Wicksell to the modern theorists of public choice. The unifying theme that runs throughout this literature is the concern to somehow reconcile the private goals of utility maximizing individuals with the welfare of society as a whole. Political institutions, and particularly the state, are the medium through which this reconciliation is achieved. Thus, according to Buchanan:

In one sense, all of public choice or the economic theory of politics, may be summarized as the "discovery" or "re-discovery" that people should be treated as rational utility maximizers in all of their behavioural capacities (1978, p. 17).

In fact it would be inconsistent to ascribe "selfish" maximizing behaviour to the individual in his market transactions and some other (perhaps altruistic or self-sacrificing) motivations in his political interactions (Olson, 1965, p. 101). Therefore, the fundamental assumption underlying modern public choice theory is that persons who act in agency roles, as "governors", are not basically different from their fellow citizens, and methodological consistency requires that the same behavioral motivations be attributed to individuals in public and private choices (Brennan and Buchanan, 1980, p. 5).
(2.2.2) Classical Theories of Collective Decision Making

The chief problematic of any neoclassical theory of the state or the public sector is the necessity to move from the individual purposive-rational agent as the basic unit of analysis, to an explanation of the observed behaviour of social groups (parties, interest groups, etc.) and institutions (the state, government, legislature, bureaucracies, etc.). Many of the classical economists devoted attention to the task of defining the "proper" role of the state. Both Petty and Smith provided a list of functions, such as defence, administration of justice, public works, education, poor relief, etc. J. B. Say approached the modern view that the state derives its raison d'etre from the existence of divergences between private and social costs. Drawing on earlier work along these lines by Storch, Say proposed a list of state functions similar to those of Petty and Smith, and rationalized them on the grounds that no single individual would have sufficient incentive to pay for these services despite the fact that he obtained benefits from them (Baumol, 1965, p. 183). In this respect, he was ahead of J. S. Mill who motivated a similar set of "legitimate" state functions on the grounds of charity alone, and did not address the problem of possible differences between social benefits and private returns (Mill, 1977, p. 388). Some German writings of the nineteenth century - notably those of List and Wagner - are compatible with the classical English view of the state as an institution justified by the distinction between individual and
social wants and the corresponding externalities (Baumol, 1965, p. 193). Among the Jevonian marginalists, Sidgwick's Principles of Political Economy contain an almost perfect statement of the Pigouian divergence between private and social costs (Ibid., p. 195). As early as 1896, Wicksell recognized that public policy is made by politicians who are themselves maximizing, goal-oriented individuals participating in a legislative process (Wicksell, 1964, p. 79; Buchanan, 1979, p. 4).

Wicksell was also aware of the importance of unanimity as a benchmark rule which would ensure that all governmental actions represented genuine Pareto improvements for all persons as measured by the independent preferences of individuals themselves (Van den Doel, 1979, pp. 73-74). But he abstracted from the transactions costs and free-rider problems which, in the real world, are usually sufficient to preclude such constitutional arrangements (Brennan and Buchanan, 1980, pp. 6-7). The traditional normative theory of public decision making is nevertheless based upon the value assumptions inherent in the Pareto criterion. The most fundamental of these is the concern with the welfare of all individuals in society rather than with some organic conception of "the state". An additional assumption underlying Paretian welfare economics is that the individual should be considered the best judge of his own social welfare, which rules out the possibility of interdependent utility
functions.  

While some political economists worried about how public order could be maintained in the face of individual selfishness, a number of mathematicians concerned themselves with a different aspect of the interface between individual maximizing behaviour and social consensus, thus providing another input into the modern economic theory of politics. The work of these mathematicians focused upon the problem of devising decision rules for committees and elections which would ensure that the will of the majority prevailed. Condorcet, writing in the latter half of the eighteenth century, discovered that the candidate who wins an election may not necessarily be the one who stands highest on the average of the electors' schedules of preferences. This so-called "voters' paradox" (or problem of cyclical majorities) arises out of the fact that a majority of

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More recently, however, theorists such as Sen, Peacock and Rowley have questioned the compatibility of this second proposition with the principles of orthodox liberal philosophy, with which the concept of Pareto optimality claims a strong affinity (Peacock, 1979, pp. 23-28). They argue that the Pareto principle reflects an essential conservatism which derives directly from the rejection of the notion that interpersonal welfare comparisons are possible. There are very few situations in which a reallocation of resources will harm nobody while some benefit, and any social welfare criterion which treats these reallocations alone as beneficial necessarily implies a preference for the status quo. According to Peacock, a further problem arises in situations where a Pareto improvement would result from such actions as the destruction of a market or the preservation of a bureaucracy where a viable market alternative is available, both of which are inconsistent with liberal values. Genuine liberalism is concerned with minimizing restrictions on individual freedom, which in turn involves opposition to any extension of the size of the public sector at the expense of private markets, even at a cost in terms of sacrificed material welfare (Peacock, 1979, p. 26).
voters may prefer A to B, B to C and C to A, which implies that social choices can violate a fundamental canon of rationality normally applied to individual choices - namely, the principle of transitivity (Hardin, 1982, p. 138). In other words, when individual preferences are aggregated by means of voting, the resulting preference ordering of the group as a whole becomes intransitive (Van den Doel, 1979, p. 79). This finding has been confirmed and elaborated by Black (1963, pp. 56-57) who shows that it may not always be possible to select a single candidate (or proposal) that would best represent the desires of the majority. An important earlier writer on this topic was the Rev. C. L. Dodgson (Lewis Carroll), who drew on the work of Condorcet, Borda, Laplace and Nanson, all of whom attempted to establish a method of specifying the most "desired" alternative by imposing additional constraints on the choice mechanism (Black, 1963, pp. 46, 158, 187, 189).

The most rigorous modern formulation of the problem is that of Kenneth Arrow (1963). He sets out to construct a procedure for passing from a set of known individual tastes to a pattern of social decision making. In other words he attempts to specify a consistent social welfare function such that the choice made by society from a given environment depends only on the orderings of individuals among the alternatives in that environment. However, he finds that, abstracting from interpersonal comparisons of utility, there is no way of moving from individual tastes to social preferences which will be
defined for a wide range of sets of individual orderings, without precluding individuals from choosing certain options or without appointing a "dictator" (Arrow, 1963, p. 59).

The practical significance of Arrow's theorem has been questioned by Tullock (1967b). He proposes that each of the characteristics of alternative social states be arranged along an axis (either as a continuous variable or as a series of points), and that each individual be assumed to have some optimal position in the resulting dimensional space. If it is further assumed that the individual's utility declines as we move away from his optimum in any direction (i.e., preferences are "single-peaked"), then it follows that majority voting, although it will not produce a "perfect" answer to the problem of collective decision making, will approximate fairly closely Arrow's criteria for the existence of a democratic social welfare function, especially if there is a large number of voters (Tullock, 1967b, pp. 38, 46-49). Furthermore, it has been shown by Sen (1970) that, although the Arrow impossibility theorem is valid for social welfare functions (which require transitive preference orderings), it does not necessarily hold for "social decision functions", which are defined as collective choice rules which generate preference relations that are sufficient for the existence of choice functions (and do not depend on transitive orderings). Sen therefore shows that there are collective choice rules ("social decision functions") which facilitate the selection of single best alternatives from a
subset of social states and which also satisfy all the conditions identified by Arrow for the existence of consistent social choice based only on individual preferences (Sen, 1970, p. 48). In general, any set of conditions imposed on collective choice rules can be satisfied by any number of rules, depending on the nature of the conditions themselves. If we allow that individuals may be able to reveal, at least partially, the intensity as well as the ranking of their preferences, the relevance of Arrow's theorem to actual political decision making is considerably reduced (Auster and Silver, 1979, p. 45).

(2.2.3) **Modern Public Choice: Economic Theories of Political Behaviour**

The traditional theory of public finance consists primarily in a framework for rational policy making, which postulates the existence of a benevolent interventionist government whose actions are motivated only by the need to achieve desirable levels of certain quantifiable economic objectives (such as rate of income growth, rate of inflation, distribution of income, etc.). No attempt is made to offer an explanation as to how policy is in fact conducted. This represents the point of departure for modern public choice theorists, whose more ambitious concern is to explain how and why policies are

*The Arrow impossibility theorem remains valid, however, if we impose an additional restriction on social preferences — namely that if two alternatives, X and Y, are both best in S1, a subset of S2, then one of them cannot be best in S2 without the other also being best in S2 (Sen, 1970, pp. 17, 51).*
selected in the first place, which in turn involves an examination of the political and bureaucratic processes as explicitly economic phenomena (Peacock, 1979, pp. 4-7).

Many of the benefits produced as a result of group activity - whether it be the activity of the state, an interest group, a club, or any other organization of individuals brought together to achieve a common goal - are non-marketable collective goods or public goods. No single individual member of the group can easily be excluded from enjoying these benefits, regardless of the size of the contribution he has made to their attainment. This "free-rider" aspect of collective goods has been explored by Olson (1965), who has shown that the larger the group, the smaller the share of the total benefits accruing to any one individual or subset within the group, and hence the less the likelihood that utility maximizing economic agents will have sufficient incentives to get together and ensure that the benefits are in fact produced. Bargaining costs, organizational costs, and other types of transactions costs are likely to

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5In the absence of discrimination on the part of the state in the provision of public goods, the amount of each public good captured by the median voter depends on the divisibility of the service flow created by that good. The degree of divisibility may vary depending on the particular category of public supply, and it may also be possible for a group of voters to secure legislation providing services which accrue exclusively to itself or differentially tax outsiders at higher rates (Borcherding and Deacon, 1972, pp. 893, 900). In addition, Borcherding has pointed out that despite some element of jointness in the consumption of certain goods, these goods may still be produced and distributed privately if the property rights to the stream of individual consumption services are enforcable at zero policing costs or if exclusionary devices can be introduced at a sufficiently low cost (1978, p. 112).
increase with the size of the group. Thus no large combination of rational individuals can support itself without some "selective incentive" - i.e., without providing some sanction or some attraction distinct from the public good itself (Olson, 1965, pp. 15-16, 47; 1982, p. 31). Olson's work is simply a more rigorous elaboration of the well-known classical theorem that, even if any particular collective action significantly increases the welfare of society as a whole, there is no guarantee that self-interested individuals will voluntarily negotiate with one another to implement such action (Wicksell, 1964, p. 81). Similarly, Baumol (1965) develops a theory of the state which is essentially an extension of the "externalities" or "public good" argument. The existence of the state is necessitated by the fact that "persons in pursuit of their own immediate interests will be led to act in a manner contrary to the interests of the others" (Baumol, 1965, p. 180). If voluntary negotiations and bargaining are too costly relative to the private benefits, the coercive mechanism of the state is

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6Hardin (1982) draws attention to the close similarities that exist between Olson's public good problem and the infamous "prisoners' dilemma". In a dynamic world in which the prisoners' dilemma game is continuously iterated, however, it is possible that incentives for cooperation can arise which would be absent in a static formulation of the problem. Cooperative contracting between players may take the form of "conventions" which emerge directly out of the coordination of self-interested behaviour. The extent of such contracting is nevertheless constrained by the debilitating effects of large group size (Hardin, 1982, pp. 13, 156).
required in the interests of maximum social welfare."

The process whereby individual maximizing behaviour is transmitted into collective decisions has been subjected to thorough analysis by Buchanan and Tullock (1965). Their purpose is to explain why specific rules for collective decision making (such as unanimity, simple majority, etc.) emerge at the "original" or constitutional level of choice. Buchanan and Tullock identify two types of costs which result from interaction between individuals. The first of these are "external costs" - the costs that any one individual expects to endure as a result of the actions of others. The larger the number of people who are required to agree before collective action can be undertaken, the lower the external costs. The second category of costs consists of "decision costs", which are the transactions costs that are incurred in securing agreement between two or more people. For any given activity, the rational individual at the time of constitutional choice will choose that decision making rule which minimizes the present value of external and decision costs expected to accrue to him. Buchanan and Tullock's model demonstrates that whether or not certain activities are collectivized or left to private citizens depends upon the relevant decision rule and the costs associated with

'It should be noted, of course, that the "prisoners' dilemma" aspect of the public goods problem may be avoided if responsible behaviour based on an "altruistic morality" is attributed to the participants. Specifically, the prisoners' dilemma is resolved if individuals are assumed to act in an inherently cooperative fashion (Van den Doel, 1979, pp. 59-60).
that rule. The model also shows that there is no a priori reason why a decision rule requiring the assent of a simple majority should maximize societal welfare. Even a less-than-majority decision rule can produce Pareto-optimal results providing that it is possible for the beneficiaries and the losers from a particular outcome to bargain with each other (either directly by making compensatory money transfers or indirectly by trading votes on different issues, or "logrolling"). However, if the transactions costs associated with such political exchange are prohibitive, utility maximizing individuals may rationally opt for simple majority rule at the stage of constitutional choice. Uncertainty about whether his own interests will lie on the side of the majority in the sequence of future choices will lead the individual to prefer rules or constitutions that will seem "fair", in the Rawlsian sense, no matter what final position he may occupy on any one issue (Rawls, 1971, p. 11).

His own self-interest will lead him to choose rules that will maximize the utility of the individual in a series of collective decisions with his own preferences on the separate issues being more or less randomly distributed (Buchanan and Tullock, 1965, p. 78).\(^6\)

Of course this result will not hold if political power is, from the very outset, solidified into permanent or quasi-permanent

\(^6\)According to Rawls, a principle of justice is "fair" if it is arrived at through free bargaining of rational individuals in a hypothetical "original position of equality" in which "no one knows his place in society, his class position or social status, nor does any one know his fortune in the distribution of natural assets and abilities, his intelligence, strength, and the like... The principles of justice are chosen behind a veil of ignorance" (Rawls, 1971, p. 12).
coalitions:

On the basis of purely economic motivation, individual members of a dominant and superior group (who considered themselves to be such and who were in possession of power) would never rationally choose to adopt constitutional rules giving less fortunately situated individuals a position of equal participation in governmental processes (Buchanan and Tullock, 1965, p. 80).

The theories of political behaviour which we have discussed up to this point are essentially "demand-driven" in the sense that they focus upon the different ways in which individual preferences may be amalgamated to generate collective results (Buchanan, 1978, p. 10). The supply of public goods is determined by the behaviour of politicians, political parties and bureaucrats, and a number of economists have tried to explain their activities on the basis of the individual maximization hypothesis. Downs (1957) points out that attempts to treat the state or government as an endogenous variable are scarce because most economists have followed the classical normative tradition of considering the state as a disturbing influence upon the self-regulating private economy. Governments have often been characterized by traditional theorists of public choice as depersonalized, frictionless machines which serve only to carry out the will of the majority (Downs, 1957, p. 205). These theorists have usually ignored the structure of incentives that determines the actual behaviour of the people who make up the government, an approach which is blatantly inconsistent with the methodological individualism and choice-theoretic orientation of neoclassical economics:
...it is unreasonable for any economist to set forth a whole theory of government behaviour without treating government as a part of the division of labour, i.e., without showing how the private motives of its members influence their actions (Downs, 1957, p. 289).

Downs thus starts from the proposition that all economic agents, including the individuals who comprise governments, behave rationally. (The term "rational" refers, of course, to the processes of action, and not to the ends or goals of that action.) Secondly, Downs assumes that every government aims to maximize its political support, so that the primary goal of politicians is re-election. Therefore each political party seeks to maximize votes. It has in fact been shown by Tullock (1967b) that, in such a situation, the choices of politicians will reflect the preferences of the median voter as long as the number of voters is large relative to the number of issues and the preferences of the electorate are single-peaked over the issue space. This follows from Black's well-known proof that, given these conditions, majority rule will facilitate the selection of the optimum of the median voter as an equilibrium outcome (Tullock, 1967b, pp. 27, 38; Mueller, 1979, pp. 40-41). However, positive transactions costs, and especially information costs, can often prevent the adoption of policies which would be optimal in a welfare sense. Individual voters do not have much inducement to procure costly information about all the issues upon which they are voting, because the effect of any one person's vote is quite small. Thus voters may rationally choose not to be fully informed (Downs, 1957, p. 258). In addition, the Arrow (im)possibility theorem implies that it may not, in fact,
be possible for political parties to identify options which are unambiguously preferred by all voters (Arrow, 1963; Downs, 1957, p. 180).

Just as Downs analyzes the behaviour of utility maximizing politicians, so Niskanen (1968; 1971) focuses upon the motivations of individual utility maximizing bureaucrats. The bureaucrat's utility is assumed to be a function of his salary, perquisites, reputation, power, ease of management, etc. - which in turn are assumed to bear a positive functional relationship to the total budget of his bureau. Niskanen's model characterizes the bureaucrat as striving to maximize the size of his budget subject to the constraint that the budget must be at least as great as the minimum total cost of supplying the output expected by the bureau's sponsors. (The bureau effectively exchanges a specific output in return for a specific budget.) Niskanen shows that whether it is constrained by the size of its budget relative to its production costs, or by the demand for its services on the part of politicians, the bureau will generally supply a greater than optimal level of output relative to that which would be produced by a competitive industry. A factor surplus or producers' surplus is consequently generated, which means that those factors of production employed by the bureau, as well as the bureaucrats themselves, have an objective interest in the extension of the bureau and will strongly advocate further increases in its output (Niskanen, 1968, p. 303; 1971, p. 64). The ability of the bureau to create this
producers' surplus depends upon the elasticity of demand for its services: the greater the demand elasticity, the closer the bureau approaches the optimal level of output. Following Downs, Niskanen assumes that the politicians who are responsible for the bureaus will recommend programs to the legislature that maximize their perceptions of the net benefits accruing to the median voters in the constituencies they represent. In other words, politicians maximize a utility function the chief argument in which is their expected probability of re-election (Niskanen, 1971, p. 139).

One of the most comprehensive attempts to integrate the theory of public goods with a theory of political decision making is undertaken by Albert Breton (1974; 1978). He commends Downs for successfully accounting for the chief institutional elements of democratic polities. However, Breton points out that the only constraints on the behaviour of political agents in Downs' model come from competition between parties and the costliness of information. Downs' theory "does not incorporate the essential 'conflict-full' element of joint consumption which is an integral property of public and non-private goods" (Breton, 1974, p. 6). Breton maintains that the public aspect of goods supplied by the state is able to explain many features of collective behaviour which Downs simply attributes to positive information costs (Ibid., p. 206). In Breton's model, governments supply public policies (rather than goods and services per se), while individual citizens demand these
policies according to their tax-prices, prices of substitutes and complements and their incomes. Citizens engage in political activity in order to narrow the gap between the amounts of particular public policies which are supplied and their demands for these policies. The degree of frustration which individuals will feel towards government actions will be a function of the divergence between their tax obligations and the amount and form of public services which enter into their utility functions. The greater this divergence, the greater is the incentive for individuals to incur the costs of influencing the behaviour of government (Peacock, 1979, pp. 72-73). The extent of political activity depends also on the price of political involvement (lobbying, voting, etc.). Politicians are assumed to adjust the level of supply of public policies in such a way as to maximize a utility function which depends on the probability of re-election, subject to the constraints imposed by the costs of supplying different bundles of public policies and by the nature of the decision rules or constitution of the society. The supply of policies in turn depends on the interaction and bargaining between bureaucrats and politicians who have independent preference rankings over alternative policy packages. Following Miskanen, Breton assumes that bureaucrats attempt to maximize the size of their budgets. Thus competition is not limited to that which takes place between politicians for votes (as in the case of Downs' model). Competition also occurs between politicians and bureaucrats (since politicians generally desire
different characteristics of public policies than those which are coveted by bureaucrats), and between politicians and citizens, as the latter attempt to bid down the value or number of policy characteristics desired by politicians (Breton, 1978, pp. 60, 62). Breton's model thus closely approaches a "general equilibrium" analysis of "democratic" political systems. Alongside the traditional goods and factor markets, there exists a "political market" in which competing political parties attempt to achieve or maintain power by offering policies in exchange for votes. There is also a "policy supply" market in which bureaucrats offer alternative administrative packages to promote the policy aims of politicians, and a "policy execution" market in which firms and households supply "cooperation" with bureaucratic measures in return for services rendered (Peacock, 1979, p. 9).

(2,2,4) Property Rights, Contract Theories, and Interest Group Theories of the State

The state is a vital component of any economic theory of property rights. Furthermore, the property rights approach means that our understanding of the state can be developed directly from individual utility maximizing behaviour (Furubotn and Pejovich, 1972, p. 1140). The role of the state, or more generally the "body politic", in property rights theory is twofold: first it must decide upon an initial assignment of property rights among individuals, and second, provision must be
made for adequate protection and enforcement of the assigned rights (Demsetz, 1966, p. 62). The state can therefore be regarded as a firm that produces and sells protection and justice in exchange for compulsory contributions (taxes) which it exacts from the citizenry (Pejovich, 1972, p. 315; Auster and Silver, 1979, pp. 2, 13). The state defines property rights through the medium of custom and law, and enforces them through its police, judicial and military power. The citizens in their turn pay for this service out of the rents which accrue to them as a result of the existence of well specified and protected property rights. Changes in the structure and assignment of property rights are explained by changes in the economic benefits which would be produced by a modification to existing rights relative to the costs of policing and enforcing the new system of rights (Furubotn and Pejovich, 1972, p. 1140). The collective nature of most of the goods and services produced by the state as a firm, together with the scale economies which exist in such activities as protection against external threat, explains the high degree of concentration in the market for "protection services", and hence the relatively large size of states (Auster and Silver, 1979, p. 57). This type of analysis throws some light on the purpose and extent to which the ruling group can exert its monopoly power to change property rights assignments over scarce resources and thereby alter both the allocation of resources and the distribution of income (Pejovich, 1972, p. 316).
The state may or may not assign property rights in such a way as to achieve maximum economic efficiency. According to the "contractarian" or "public interest" perception of the state, its purpose is indeed to embody the optimal social consensus that has emerged out of voluntary agreement (either implicitly or explicitly entered into) among all members of the community. But according to the "interest group" or "predatory" theory, the state is essentially an instrument of wealth redistribution, with the politically powerful benefitting at the expense of the powerless.

The contract approach views the state as a tool to promote efficiency through providing "public goods" that confer benefits which are not limited to those who pay for them and hence would be produced in suboptimal quantities on private markets (Posner, 1981, p. 103). For example, one of these public goods is the legal system which, according to Posner, serves as a substitute for voluntary market transactions when the latter are too costly to be profitable. Posner shows that a legal system anchored upon economic concepts of efficiency can produce resource and property rights allocations which closely approximate those that would emerge in a frictionless zero-transactions costs world of private markets (Posner, 1977, p. 11). It is also possible to treat the regulatory activities of government agencies as a response to the demand by the public for the correction of inefficient or inequitable market outcomes (Posner, 1974, p. 335). The contractarian view of the state is consistent with
Schotter's definition of a social institution:

A social institution is a regularity in social behavior that is agreed to by all members of society, specifies behavior in specific recurrent situations, and is either self-policed or policed by some external authority (Schotter, 1981, p. 11).

Most social institutions will require some form of policing or enforcement. For instance, a system of property rights is a social institution in which the behavior of individual agents is circumscribed to conform and which defines an agreed-upon regularity in behavior. However, as Schotter points out, this institution is not in equilibrium because each person has an incentive to steal from others. As a result, some external authority (the state) must be instituted (by universal consent) to enforce these rights (Schotter, 1981, p. 11).

Contractarian theories of the state are based upon the concept of mutually beneficial trade. Separate individuals are assumed to have separate goals, both in private and social spheres of action. It is through the mechanism of exchange that these separate individual interests are reconciled. Contract is a device for social cooperation, and the idea of contract has sometimes been treated as analogous to that of the invisible hand of the market (Seidman, 1973, p. 554). The classical contractarian state is a value-neutral, impartial framework within which bargaining can take place. It limits itself to enforcement of the laws and conflict resolution, and does not become involved in the active ordering of society (Ibid., pp. 555-556). According to Worth (1981), contract theories of the
state have been "resurrected" by neoclassical economists precisely because they are a logical extension of the theorem of exchange in which the state plays the role of wealth maximizer for society.

A contract which limits each individual's activity relative to others is an essential precondition for economic growth. In consequence, the contract theory approach offers an explanation for the development of efficient property rights that would promote economic growth (North, 1981, pp. 4-5).

The first task of a contractarian theory is to explain why a particular set of decision making rules - a particular constitutional framework - emerges in a given society. The establishment of these ground-rules, arrived at through mutual agreement, means that the amount of effort devoted to the maintenance and preservation of the existing allocation of resources can be reduced significantly, thus making everyone better off. These savings in property rights enforcement and policing costs are essentially the advantages which accrue by replacing the pre-contract Hobbesian "war of every man against every man" with a "civil society" (Hobbes, 1946, pp. 84-93). Any change in the underlying "natural" abilities of individuals or groups to enforce their claims to resources in a hypothetical pre-contract world will necessarily undermine the foundations of the existing constitutional framework, and may therefore initiate pressure for a change in the current contractual assignment of property rights (Buchanan, 1975, pp. 71-73). Nevertheless, once the initial "rules of the game" have been determined, marginal changes to these rules can be accounted for
by invoking the same logic as that used to explain the selection, de novo, of the "optimal" constitution (Buchanan and Tullock, 1965, p. 14). It is of course necessary to assume that the choosing individual can rank the alternatives of collective as well as market choice, and that this ranking will be transitive. Since all subsequent propositions derive directly from the individual rationality hypothesis, the same principle of substitution and the same income-demand relationships are applicable to the contract theory of the state as to the traditional theory of market behaviour.

The contractarian approach implicitly assumes that all state activity has a positive-sum outcome either in the sense that everyone gains from the actions of the state or the loss to some is more than offset by the gain to others (Dean, 1982, p. 4). As a result, contractarian theories are characterized by a "marginalist" conception of institutional change. The state is regarded as a human artifact - the product of conscious choices made by rational individuals - and is thus intrinsically perfectible. If an existing set of institutions is "suboptimal" in the sense that it fails to reflect a consensus, it will be possible to effect changes to which all members of the group will agree. In terms of orthodox welfare economics, this type of change is analogous to a Pareto-improvement, or a movement from an interior point to a point located on the utility frontier (Buchanan and Tullock, 1965, pp. 13, 318-319). Discussion necessarily focuses upon the "margins" of variation in political
institutions, and the positive, predictive content of the theory concentrates upon the efficiency effects of alternative assignments of property rights or contractual forms. This is because the transactions costs associated with alternative allocations of property rights determine the terms of the contract. Different contractual arrangements carry with them different types of transactions costs reflecting varying enforcement and negotiation requirements (Cheung, 1969, pp. 63-64). When engaging in any form of economic or political exchange, rational individuals will contract with each other in such a way as to ensure that the variance in their incomes is minimized, subject always to the constraint of contracting costs (Umbeck, 1977, p. 425).

Both contractarian and interest group models define the state as an organization distinguished from others by its comparative advantage in violence or force. As we have seen in chapter 1, the essence of property rights is the right to exclude, and therefore only an organization which has a comparative advantage in violence is able to specify and enforce property rights (North, 1981, p. 4). Thus Umbeck (1980; 1981) develops a contract theory of the state which characterizes the potential use of force as a relevant constraint underlying any initial agreements which allocate wealth among competitors. Umbeck's concern is to explain the assignment of mining rights during the California gold rush (1848-1866). In his model, "violence" is defined as labour time allocated to excluding
other individuals from a mining claim, and all miners are assumed to be homogenous both in their abilities to mine and their abilities to exercise violence. The miners do not hire "specialist enforcers" because the transactions costs of doing so are assumed to exceed the benefits. Instead, a system of property rights emerges as a result of attempts to reduce enforcement costs by capturing the scale economies available through contract with other individuals (Umbeck, 1980, p. 13). This contract constitutes Umbeck's Hobbesian state:

The state is a contract. It is the explicit embodiment of an agreement between individuals which specifies the rules or property rights within which all resources will be used and subsequent contracts formed. It is the original contract which precedes any and all agreements between individuals and marks the emergence of society from the state of anarchy (Umbeck, 1980, p. 3).

Thus the final allocation of land among miners is not explained by market competition, since the initial claims are not bought and sold; rather the rationing mechanism is the contractual agreement itself. "Any contractual agreement entered into by wealth maximizers must assign to each individual the rights to at least as much property as they could get with personal force" (Umbeck, 1981, p. 45). 9

9An alternative to the land allotment contract is an output sharing agreement, in which each miner would work a certain number of hours on a commonly owned piece of land and the gold output would be divided among all members of the community according to a specified formula. Umbeck shows that the costs of reaching agreement and measuring or metering the agreed distribution would not differ significantly between the two forms of contract, but that the land allotment contract would be cheaper to enforce, especially as the number of miners increased (1977, pp. 424-425).
The contract serves as a medium of social organization of economic activity, and as such performs several conceptually different functions, all of which have to do with the fundamental economic tasks of deciding what goods and services are to be produced, and in what proportions, as well as how to distribute the product among members of society (Knight, 1971, pp. 5-6). First, the contract defines property rights and prescribes the limits within which individuals make choices concerning resource use. Second, it assigns these rights exclusively to individuals who agree to abide by the rules of the contract, and third, it provides for the enforcement of this exclusivity. The extent of enforcement capacity determines not only the effectiveness of the state but also its geographic limits. Having defined the state in these terms, it now becomes possible to explain why individuals choose to include certain provisions in the contract and exclude others. For example, the California gold miners apparently agreed to restrictions on their rights to sell or otherwise exchange their claims, an agreement which has been regarded by traditional historians as "inefficient" or "irrational". However, Umbeck's model shows that such restrictions may be fully consistent with an efficient allocation of rights if the constraint of positive transactions costs (especially enforcement costs) is taken into account. By preventing miners from transferring their claims to other miners who already owned land in the community, the population of the district could be maintained at its original level, thus
reducing individual enforcement costs through economies of scale. It was only when technological change occurred, with the introduction of hydraulic methods of gold extraction, that the gains from land consolidation began to outweigh the costs in terms of foregone scale economies in enforcement (Umbeck, 1980, pp. 15-16).

In contrast to contractarian or "public interest" theories of the state are those which have been variously labelled "interest group", "redistributive", "conflict", "exploitation" or "predatory" theories (North, 1981, p. 5; Posner, 1974, pp. 335-336; Posner, 1981, p. 103; Dean, 1982, p. 1). According to this type of approach, the state is an agency of a group or class, and its function is to extract income from the rest of the constituents in the interests of that group or class. The predatory state specifies a set of property rights that maximizes the revenue or wealth of the group in power regardless of its impact on the welfare of society as a whole (North, 1981, p. 5). In terms of Auster and Silver's model of the state as a firm, the relevant analogy is to regard the state as "owned" by a particular individual or group in whose interests it functions. Unlike the Marxist view of the state as emerging out of the conflict produced by the division of labour, it is treated as itself a part of that division. In other words, as the division of labour becomes more developed, a separate industry to produce collective enforcement of property rights is created - i.e., rulers emerge as a distinctive "occupational
According to interest group or predatory theories, political choice is the outcome of efforts of individuals and interest groups which place pressure on the public authority (the organs and institutions of the state) in the process of maximizing their own private utility functions. The government's maximand is accordingly assumed to be a stable function of the utilities of the relevant interest groups weighted by their political strength or influence. Thus there is no such thing as a "benevolent government" striving to internalize all externalities and guiding a social welfare function that embraces unorganized interests (Dean, 1982, pp. 2, 8). For example, Becker (1983) has developed a model of competition among pressure groups for political influence in which it is assumed that such influence can be expanded by expenditures of resources on campaign contributions, political advertising, etc. In the political equilibrium that emerges from this process, all groups maximize their incomes by spending an optimal amount on political pressure, given the productivity of their expenditures and the anticipated reactions of other groups. Becker abstracts from the voting behaviour of individual members of the electorate and voter preferences serve only to mediate passively between pressure group activity and the responses of the state. The reason for this assumption is that the tastes of voters can be manipulated and created through the information or misinformation provided by interested pressure groups, who raise
their influence in precisely this way. Furthermore, Becker follows Downs in emphasizing the extremely limited incentives for individual voters to become fully informed about all political issues (Becker, 1983, pp. 372, 392).

The solution resulting from such interaction between the state and the groups whose interests it articulates may be "politically efficient" in the sense that the sum of the utility of the ruler and the influence-weighted utilities of the citizens is maximized, but that this need not coincide with "economic efficiency". Certain groups of citizens may benefit at the expense of others without any compensatory side-payments, so that the outcome is not Pareto-optimal; but the losers' utility is weighted by such a small political-influence coefficient that the behaviour of the state continues to be fully consistent with political efficiency as defined. In terms of Becker's analysis, the greater the influence of any one group, the less that of all competing groups, although even a group which is a net loser in the redistributive process can attenuate its losses by increasing its level of expenditure on the production of political influence. Therefore, the political game modeled by Becker is zero-sum in influence, although it is negative-sum in taxes and subsidies because of deadweight costs (1983, p. 375). Similarly, one of the implications of Olson's theory of collective action is that the typical pressure group will have little or no incentive to make any significant sacrifices in the interests of society as a whole, especially if it represents
only a small proportion of that society. The group can best serve its members' interests by striving to appropriate a larger share of total output, even if the social costs of the ensuing redistribution exceed the amount redistributed. There is, in general, no constraint upon the social cost that such an organization will find it expedient to incur in the course of its activities (Olson, 1982, p. 44).10

Brennan and Buchanan (1980) propose a hybrid theory of the state which incorporates elements of both contractual and predatory behaviour. In their model, the power of politicians and bureaucrats is constrained by rules initially laid down at a constitutional level of deliberation by rational citizen-taxpayers acting behind a Rawlsian veil of ignorance. In the post-contract period, however, governments (or, more precisely, the individuals involved in the governmental process) are able to exercise genuinely discretionary coercive power and it is assumed that they will attempt to exploit that power for their own purposes (Brennan and Buchanan, 1980, pp. 23, 37). Brennan and Buchanan's conception of the state in the post-constitutional decision period is therefore essentially predatory: governmental decision makers maximize their own

10An interest group theory of the state does not, of course, preclude the possibility that the state may take action to increase economic efficiency, if this goal is promoted by one or more influential interest groups, or if a cheaper (in terms of deadweight costs) method of raising taxes or disbursing subsidies is discovered. The predatory state may then produce efficiency-augmenting redistributions as a side-effect (Becker, 1983, p. 384).
utilities subject to given constraints, including those that may be imposed by means of a constitution. In fact, the simplest version of the model is based on the presumption that governments maximize revenues from whatever sources of taxation are made available to them constitutionally. If the ruling group is constrained to spend a certain amount of tax revenues on prescribed public goods, it is the surplus of total revenue over this mandatory expenditure which becomes the relevant maximand for state personnel. The interests of this monolithic revenue-maximizing Leviathan are served automatically as a result of the interaction of the whole set of individual government decision makers even if no one person explicitly sets maximum revenue as the goal of his own action (Brennan and Buchanan, 1980, p. 29). The state is thus treated as a collectivity which acts as a single entity, thereby simplifying considerably the complexities of the political process within the government sector.

The redistributive role of the predatory or "interest group" state is most frequently evidenced by the behaviour of state agencies, bureaucracies and regulatory bodies. Governments are portrayed in such models as covertly using their conventional functions in order to redistribute wealth, and economic regulation is explicitly assumed to serve the private interests of politically effective groups (Posner, 1974, p. 343). For example, Aaron Director has proposed a "law of public expenditure" in which government spending is regarded as
privately benefitting the middle classes and financed by taxes which are largely borne by the poor and rich. Stigler (1970) cites farm price supports, minimum wage laws, social security, public housing and tax exempt institutions as examples of public policies which have generally benefitted the middle classes. If the ruling coalition of voters is to make effective use of the political machinery of the state to redistribute income in its favour, it must identify a state activity or expenditure program whose benefits flow to the coalition in greater proportion than the taxes which finance it. In support of his contention that classes of citizens strive to manipulate the institutions of the state to their own advantage, Stigler points out that the state is involved primarily in the supply of services, which also happen to be extremely difficult to transfer between classes because they are usually non-traded (Stigler, 1970, p. 5). A great deal of labour market discrimination may be explained by expenditure and employment practices which are motivated solely by a desire to redistribute wealth from politically powerless groups to a privileged coalition which is able to control the state to its own benefit (Freeman, 1973; 1974).

According to this view, regulation is used as a substitute for explicit taxes and subsidies to transfer benefits from one group to another, reflecting once again the fact that the purpose of the state is not to maximize some consensual social welfare function. Instead, its actions constitute nothing more than a response to relevant interest groups (Dean, 1982, p. 9).
A further application of the "interest group" theory of the state is to be found in Borcherding's explanation of the apparently "wasteful" effects of public supply (1983). Given that the objective goal of government is to effect certain politically (rather than market) motivated redistributions, the public bureau or regulated firm may be the most efficient way to realize this goal, despite the fact that on economic grounds alone it may rank as considerably inferior to a system of private "contracting-out". Becker likewise points out that, if public ownership is an efficient way to achieve the subsidization of certain favoured groups, replacement of public by seemingly more efficient private enterprises could lower rather than raise aggregate efficiency because less efficient subsidies must be used (1983, p. 387). The private firm has no interest in redistribution per se, and a system of contracting-out would necessitate costly monitoring to ensure that the state's redistributive goal was effectively pursued. Bureaucratic or regulatory modes of supply are more "selective":

A private firm will not have the same incentive to tailor benefits to the politically "worthy", since its objective function contains pecuniary wealth arguments, not political ones. It will, to the eyes of the politicians, act irresponsibly, since it has, in fact, no incentive to dole out the transfers "optimally", but rather as cheaply as possible (Borcherding, 1983, p. 166).

Borcherding concludes that the more important the goal of redistribution in the provision of public goods, the more likely this provision will be effected through state bureaus. In another study, Borcherding shows that the public sector is an
extremely effective medium for achieving discriminatory redistributions of wealth in favour of politically powerful racial coalitions (1977, pp. 54-55).11

Neither the contract approach nor the predatory/interest group approach to the state is free of serious analytical omissions. The contract theory explains the benefits to be derived from economizing on the use of resources and therefore emphasizes the role of the state in promoting efficiency and wealth maximization. In other words, it deals primarily with the gains of the initial contracting. However, it does not adequately explain the subsequent maximizing behaviour of constituents with diverse interests. The predatory theory, on the other hand, ignores the gains of contracting and focuses instead on the extraction of rents from constituents by those who gain control of the state (North, 1981, pp. 5-6). In an attempt to remedy these deficiencies, North provides an alternative model of the state which represents a more general synthesis of contractarian and interest group approaches.

In North's model, the state exchanges a group of services (protection, justice, etc.) in return for revenue. Since there are economies of scale in providing these services, the total wealth of society is augmented as a result of the activities of the state. This is the only contractarian element of North's model. The state also strives to maximize its own revenue (i.e. the wealth accruing to the rulers) by acting like a

11 See chapter 3, section 3.3.1.
discriminating monopolist and devising separate property rights for each group of constituents. In doing this the state is constrained by the existence of rival ruling groups—both external (competing states) and internal (competing political coalitions) (North, 1991, p. 7). Thus, on the one hand, the social welfare-augmenting function of the state implies an efficient set of property rights to maximize societal output, while the predatory aspect of the state implies an assignment of property rights that maximizes the rulers' income. Not surprisingly, "there has been a persistent tension between the ownership structure which maximized rents to the ruler (and his group) and an efficient system that reduced transactions costs and encouraged economic growth" (Ibid., p. 10). The result of this contradiction is a system of property rights that is frequently regarded as "inefficient" or even irrational by economists and historians (North and Thomas, 1973, p. 8). An "efficient" allocation of rights may lead to higher income for society as a whole, but lower tax revenue for the rulers because of the transactions costs of monitoring, metering and collecting such taxes, as compared to a more "inefficient" set of property rights with lower associated costs. Like the concept of "externality", the term "efficiency" loses all positive content and its definition comes to depend entirely upon the relevant set of transactions costs. It is, in fact, only the existence of positive transactions costs that distinguishes North's model from a purely contractarian or public interest theory and places
it firmly in the category of a predatory conception of the state. Under conditions of zero transactions costs, the rulers could always devise an efficient set of rules or property rights and then bargain for their rents, in which case maximum societal output would be consistent with maximum state revenues (North, 1981, p. 16n).

North concedes that his model has one major shortcoming (which it in fact shares with all non-contract theories) - namely an inability to account for institutional change which is not initiated by the ruling group. The rulers will make institutional innovations in response to changing relative prices and transactions costs. For example, a rise in the scarcity of labour relative to land would encourage the rulers to alter property rights allocations in such a way as to appropriate increased rents from labour (North, 1981, p. 22). However, the model cannot accommodate institutional changes brought about by the actions of large non-ruling groups of constituents. This is because of the public good nature of any benefits which may be derived from successful opposition to the state: no individual citizen will have an incentive to initiate such opposition because the resulting gains will accrue to him regardless of the amount of resources he devotes to achieving them. As we saw in section 2.2.3, this free-rider problem has been analyzed by Olson, who points out that it is extremely difficult to explain Marxist, class-oriented action on the basis of rational, utilitarian individual behaviour. The costs of
overcoming the free-rider problem are considerably lower in the case of smaller, more cohesive groups (Posner, 1981, p. 103), and Olson maintains that it is no coincidence that most successful revolutions have been brought about by the efforts of "small conspiratorial elites" (Olson, 1965, pp. 105-106).

North believes that the only way to circumvent the free-rider problem within the confines of his model is to somehow incorporate the concept of "ideology":

The study of ideology and the development of some positive model on the free-rider problem are essential preliminaries to formulating a dynamic theory of change in the state (North, 1981, p. 21).

Standard practice in the public choice literature has been to treat the free-rider problem as so severe that it is able to preclude active political participation by the individual whose interests may be identified with those of a large group. The rationale for voting is also not well understood, since the total cost to the individual citizen of voting exceeds the total benefit when measured in terms of the expected value of changing the outcome of the election (Mueller, 1979, p. 120). Nevertheless, there remains a lingering suspicion that ideas are important in influencing legislation, and this has prompted Kau

\[12\] For the same reason, the individual has very little incentive to acquire information about public affairs. The probability that any change in one person's vote (as a result of being better informed on the issues) will change the outcome of an election is very small. According to Olson, this imperfect knowledge of the rational voter can explain the existence of lobby groups: if citizens were able to obtain all the relevant information at zero cost, there would be no role for lobbyists (1982, p. 26).
and Rubin to attempt to separate empirically the role of ideology from that of direct self-interest or indirect self-interest (mediated through logrolling behaviour) in determining the votes cast on various issues by U.S. congressmen (1979a; 1979b; 1982). The ideological orientation of each individual congressman is proxied by the ratings assigned to him by public interest lobby groups. Kau and Rubin find that ideology is significant in explaining voting by public representatives, even on bills concerning primarily economic issues and which therefore may be expected to reflect more strongly the self-interest of constituents than the ideological positions of congressmen (1979a, p. 384; 1982, p. 80).

More recently, Kalt and Zupan (1984) have examined the extent to which ideology, defined as the altruistic promotion of self-proclaimed notions of the public interest, has influenced United States Senate voting on a specific issue (namely, federal regulation of coal strip mining). They find some empirical support for Kau and Rubin's belief that the ideological preferences of legislators, as distinct from the narrow interests of their constituents, may be an important determinant of their voting behaviour. According to Kalt and Zupan, ideological action by public representatives can be regarded as analogous to "shirking" or opportunism on the part of corporate management (1984, p. 282). There may be some separation of "ownership" by constituents and "control" by policymakers which enables a certain amount of own-welfare maximization by the
latter at the expense of the former. The more expensive it is to monitor the voting behaviour of representatives, the greater the extent to which they will indulge their ideological whims. Kalt and Zupan acknowledge, however, that the ideological factor may be highly correlated with, as yet unidentified, constituent interests, which could "explain away" the importance of ideology in the political process. For example, ideology may comprise little more than a convenient "rule of thumb" which, in a world of costly information, serves to summarize a legislator's stand on a wide range of issues and thus facilitates the choice of representatives on the part of voters (Kalt and Zupan, 1984, p. 284). This view is corroborated in a study by Peltzman (1984), in which he attempts to separate the effects on Senate voting of constituents' interests and those of campaign fund contributors on the one hand, from that of party affiliation or ideology on the other. Peltzman's purpose is to show that ideology measures, such as interest group ratings, only appear to "explain" voting behaviour because they are correlated with relevant economic variables which have been omitted in earlier work. He proposes a simple principal-agent model in which legislators articulate the parochial interests of their constituency with ideology playing an informational role analogous to that of a brand name in standard demand theory. The same "rational ignorance" on the part of voters which permits shirking by representatives in Kalt and Zupan's model could equally result in a tendency for voters to use cheap summary indicators of interest, such as a
candidate's party or reputation for liberalism, as an input into their decision making process. In other words, not only is there a strong degree of collinearity between the ideological orientation of a congressman and the interests of his supporters, but the former is determined by the latter (Peltzman, 1984, pp. 183, 195). According to Peltzman, appropriate definition of the various components of voters' interests obviates the need to treat ideology as a residual category in explaining voting.

A positive economic theory of ideology remains to be developed, although Kau and Rubin speculate upon the potential usefulness of Schumpeter's view that capitalist society creates a growing body of "intellectuals" who wield substantial power through the media and thereby condition the ideological climate (1979a, p. 367; 1982, p. 23). Another possibility is to view individual membership of politically active pressure groups as a consumption good. Consumers may desire (for whatever reason) to purchase a good called "participation", the demand for which could be assumed to depend on such factors as income or educational levels (Kau and Rubin, 1979b, p. 47; Auster and Silver, 1979, pp. 89-95). Such an explanation would be consistent with a modified Schumpeterian theory of ideology, according to which the stock of "intellectuals" increases with the total wealth of society, and individual intellectuals have an interest in opposing both entrenched theoretical opinions and entrenched institutions, since a relatively higher payoff will
accrue to those who develop a convincing intellectual case against the status quo (Kau and Rubin, 1982, p. 26). Apart from the exploratory work described in the preceding paragraphs, however, very little formal effort has been devoted by economists to analyzing the influence of ideas on political action.

Despite its neglect of the issue of ideology, North's theory of the state represents the most abstract and the most general within the economic paradigm. In chapter 4 we will develop a simple explanatory model of the evolution of the South African political system which incorporates some of the features of North's analysis. We will also propose a way to circumvent the problem of accounting for changes precipitated by the actions of non-ruling groups. This solution is suggested by a number of economic theories of political behaviour, surveyed in this chapter, which involve an extension of the analogy of market competition to the sphere of politics. It would seem that the free-rider aspect of collective action applies as much to the ruling group as to its subjects, and we will attempt to show that it is possible to preserve the idea of an "interest group" or predatory state while at the same time accommodating both rational individual behaviour and competitive interaction between agents. A model of this nature would thus have to involve a theory of political competition drawing upon the work of modern public choice theorists discussed in section 2.2.3, in order to account for the transformation of individual maximizing
behaviour into collective action.
III. A CRITICAL SURVEY OF CURRENT APPROACHES TO RACIAL PREJUDICE AND APARTHEID IDEOLOGY

(3.1) Introduction

In this chapter we will review some of the literature that has developed in response to the need to explain such phenomena as racism, prejudice and apartheid, with special reference to the South African context. Much of this literature lies outside the traditional boundaries of economics and, in order to do it full justice, it would be necessary to encroach on the preserves of other social sciences. The extent to which this can be achieved here is severely limited by the fact that the present author can claim little expertise or training in these disciplines. Consequently, the coverage of the discussion that follows will be biased in favour of economic studies of the apartheid system.

Nevertheless, we begin the chapter with a brief survey of a number of different sociological and psychological approaches to the problem of racial prejudice and ethnic exclusivism. This is followed by a more detailed treatment of orthodox economic theories of race discrimination. Thereafter we turn explicitly to the case of South Africa and provide a critical review of several studies that have attempted to account for discrimination in the South African labour market and to explain
the underlying rationale for the apartheid system. This is followed by a concluding section in which we allude to the long-standing ideological debate upon the rationality of apartheid as a socio-economic system, and thereby prepare the way for the analysis in chapter 4 by indicating how the approach to be adopted there relates to that debate. Specifically, it will be argued in the final section that apartheid can most fruitfully be regarded as a rational response to economic constraints rather than as a set of beliefs with no basis in economic rationality.

(3.2) Sociological and Psychological Approaches to Racial Prejudice and Apartheid Ideology

Sociologists, historians and political theorists have utilized a number of theoretical perspectives in order to provide an explanation of the emergence and evolution of the apartheid political system. In an extremely useful survey of this vast and diverse social science literature, Adam and Gilmoree (1979) provide a taxonomy and critical appraisal of these various approaches. It will be helpful to briefly summarize their six categories at this point.

(i) Calvinism and religiously induced prejudice:

The irrationality and impermeability of Calvinist religious doctrine has been viewed by some theorists as providing a justification for the "exclusion of the children of Ham". Thus de Villiers shows that the protagonists of apartheid have often
been able to exploit a neo-Calvinist philosophy to prove the necessity of maintaining national or racial identity as well as to justify divisions between nations and races (1971, p. 371). Such rigid racial outlooks are further transmitted and reinforced by a religiously sanctioned patriarchal family system. However, Adam and Giliomee point out that social-psychological and religious theories of prejudice neglect the objective socio-economic conditions that determine religion and ideology as endogenous outcomes. Belief systems are more usefully regarded as emerging or evolving in response to the need to interpret and accommodate a changing socio-economic environment (Adam and Giliomee, 1979, p. 19).

(ii) The fascist analogy:

The literature on South Africa is dominated by associations of fascism and Stalinism, encouraged, no doubt, by the evident structural violence of the system inherent in its restrictive laws. According to Adam and Giliomee, however, apartheid differs from fascism and Stalinism in that it does not aim at remoulding traditional institutions in the image of a glorified utopia. As a group (rather than individual) dictatorship, the South African system can be expected to pursue more rational policies of privilege maintenance, compared with the emotional and irrational dictates of a charismatic fascist dictator. Apartheid society in fact displays an element of pragmatism and a potential for internal liberalization which are both alien to the fascist state (Adam, 1971, pp. 152-153). The South African
system is legalistic rather than arbitrary and, even in its most harsh and paternalistic rhetoric, apartheid ideology has never denied the right of existence to dominated groups (Hanf, Weiland and Vierdag, 1981, p. 42). In addition, South Africa's considerable international dependency places restraints on the ability of the white power structure to rely on coercion alone. Instead, it seeks to solicit the acquiescence of its subordinates rather than their ideological mobilization.

(iii) The focus on racism:

A great deal of liberal analysis has tended to attribute to traditional racism an autonomy and dynamic of its own. Emphasis is placed on the attitudinal aspects of prejudice and irrational hate or rejection of other race groups.¹ Such ethnic or racial conflict is usually regarded as arising in situations of state violence against a scapegoat minority (e.g. Nazi Germany), colonial labour exploitation, or ethnic group competition within a single political jurisdiction (e.g. Northern Ireland, Lebanon, Cyprus) (Adam and Giliomee, 1979, pp. 36-39). Government policy

¹This approach appears to derive credibility from the proclamations of apartheid ideologues, who themselves identify differences in racial and cultural characteristics as the primary motivation for segregationist behaviour. For example, an historical analysis of the origins and evolution of the "apartheid idea" leads Rhoddie and Venter to conclude that "colour was accepted, by a process of psychological association, as the outward manifestation of more deeply seated cultural and social differences ... Colour became the criterion with which the standard of cultural and social development of an individual was judged ... To a significant degree this may be attributed to ... the fact that, as far as civilisation and general development are concerned, the Bantu was, and still is, by comparison an inferior racial group" (1960, p. 180).
in South Africa, however, does not fit neatly into any of these categories. This is because the explicit institutionalization and legalization of racial criteria for exclusion has been directed as much at fostering the unity of the Afrikaner group in the face of its own internal stratification as it has aimed to contain the "black threat". Thus, according to Adam and Giliomee, anti-black racism has not been the principal motivating force, but rather a by-product, of attempts to unite Afrikaner interests as a prerequisite for the attainment of political power (1979, p. 41).

(iv) The concept of "plural societies":
The theory of the plural society is associated with the work of sociologists such as M. G. Smith, J. S. Furnivall, Leo Kuper and Pierre van den Berghe (Schlemmer, 1977). A plural society is one in which ethnic categories live side by side, with individuals of differing ethnicity meeting only in the marketplace. These societies are often viewed as emerging out of the disintegration of native cultures under the impact of colonialism (Rex, 1974, p. 45), and the domination of one ethnic group over others is treated as a problem which is intrinsic to the concept of pluralism (Hanf, Weiland and Vierdag, 1981, p. 6; Adam and Giliomee, 1979, p. 43; Lijphart, 1977, p. 18). According to Schlemmer, social group formation in a "plural society" can be based upon race, ethnicity, caste, class, religion, or any combination of these. The unifying idea behind all theories of pluralism is that the distribution of rewards in society is
determined by competition between large "corporate groups" or "communally bounded masses" rather than small elites or cliques. An ideology of popular social communalism (which in the case of South Africa has been referred to by Moodie (1975) as the "Afrikaner civil religion") serves to define the "identity needs" of a mass of people and to mobilize them in pursuit of those needs (Schlemmer, 1977, p. 7). The problem with the pluralist perspective is the assumption that "cultural diversity" in itself is sufficient to cause societal instability and the domination of one ethnic group over all others. In this way, ethnic conflicts are treated as independent of the degree of material equality and the distribution of resources, and economic factors are thereby excluded from the analysis. In the words of Adam and Giliomee: "The pluralist perspective tends to reify cultural differences as if they were immutable" (1979, p. 45).

(v) The focus on class formation:
Marxist analysis, unlike those explanations based solely on racism or cultural pluralism, emphasizes the economic benefits of racial exploitation. Orthodox Marxists view apartheid as a mere manipulative device for oppression and control of labour (Legassick, 1974), while neo-Marxists have focused on the divergent interests of fractions of the working class (for

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2 According to Moodie, a "civil religion" denotes the religious dimension of the state, where religion is defined broadly to include any set of symbols which serves to assist an individual or group in meeting its need for identity and destiny (Moodie, 1975, pp. 295-296).
example, the latter account for the relative quiescence of white workers since 1922 by the fact that they receive a proportion of the surplus generated by the forced labour economy, and therefore identify their interests more strongly with the capitalist class than the working class). However, Adam and Giliomee argue convincingly that both orthodox Marxists and neo-Marxist analyses of South African society have displayed an overly simplistic view of the role of beliefs and ideology. Material rewards are only a part of the payoff that accounts for the maintenance of Afrikaner unity. Equally important are the cohesive power of the symbol system, rewards of esteem and status, and the integrating role of ideology (Adam and Giliomee, 1979, pp. 49-50).

(vi) The colonial analogy:
South Africa is sometimes considered as the last outpost of an outdated system of alien rule. The eventual demise of apartheid is accordingly regarded as certain as the departure of the European powers from the rest of Africa. This colonial perspective, however, has little applicability to South Africa. The industrialization of the country coincided with the emergence of a genuinely indigenous capitalist class and an anti-colonial movement.

Once cultural and economic mobilization was successfully achieved among Afrikaners a share in and later a takeover of exclusive central political power remained only a matter of time...(Adam and Giliomee, 1979, p. 52).

In addition, there is no discernable common imperialist interest
between South Africa and other supposedly "imperialist" powers. In fact, relations between the two are often characterized by frictions over such issues as the conditions under which foreign capital is permitted to operate in South Africa (Adam and Giliomee, 1979, pp. 56-58).

After identifying the above six categories of sociological theories of racism, prejudice and apartheid, as well as the weaknesses associated with each approach, Adam and Giliomee proceed to elaborate an alternative perspective (that of "ethnicity" or "ethnic mobilization"), which combines the pluralist emphasis on ideology and culture as cohesive factors in group organization with an explicit recognition of the important role played by economic costs and benefits. The concept of ethnicity as applied to South Africa by Adam and Giliomee is thus consistent with, and in fact provides a useful descriptive backdrop to, the economic theory to be proposed in chapter 4. Adam and Giliomee's approach will therefore be dealt with separately in section 3.4 below.
Economic Approaches to the Explanation of Race Discrimination and Apartheid

A Critical Survey of Economic Theories of Race Discrimination

A neoclassical economic explanation of race discrimination in the labour market would not accept a rigid wage differential between blacks and whites of equal productivity as a given datum, but would attempt instead to explain the differential in terms of racially differing costs and returns to wage equalization (Reder, 1973, p. 41). While the earliest statement of the neoclassical theory of discrimination can probably be attributed to Edgeworth in 1922, most current work derives from Becker (1957) and elaborations of Becker's model by Krueger (1963), Welch (1967), Arrow (1972a; 1972b; 1973), Alexis (1973), Stiglitz (1973) and others. According to Becker: "If an individual has a 'taste for discrimination' he must act as if he were willing to pay something either directly or in the form of reduced income, to be associated with some persons instead of others" (1957, p. 14). Assuming perfect competition, homogeneous factors of production and fixed institutional arrangements, Becker defines a "discrimination coefficient" to measure the "taste for discrimination" for different factors, employers and consumers. For example, if an employer faces a money wage rate,
$w$, for workers, then $w(1+d(i))$ defines a net wage rate, where $d(i)$ is the discrimination coefficient against factor $i$. Arrow shows that $d(i)$ equals the marginal rate of substitution between the firm's profits and and the degree of employment of this factor (1973, p. 7). Similar coefficients may be defined in terms of employee or customer discrimination.

Becker also utilizes a competitive trade model to illustrate the effects of discrimination on exchange between two "sectors" - White (W) and Black (B). It is assumed that the W sector is relatively better endowed with capital than the B sector. Also, assuming identical linearly homogeneous production functions and perfect substitutability of capital and labour between sectors, it follows that the marginal product of labour is lower, and the marginal product of capital higher, in the B sector than in the W sector. In a "non-discrimination equilibrium", even if labour is immobile between sectors, sufficient capital will be exported from W to B to equate these marginal products. But if W capitalists suffer a "psychic cost" when their capital is used in B, Becker shows that their net return is reduced by an amount depending on the magnitude of the discrimination coefficient. The existence of a positive coefficient therefore induces sub-optimal export of capital from W to B, with the result that factor price equalization does not occur and black workers and white capitalists lose income while white workers and black capitalists gain (Becker, 1957, p. 21).
This analysis, however, implies that white capital owners have no incentive to discriminate if their aim is to maximize their own incomes and if they are assumed not to have a taste for discrimination. Krueger (1963) demonstrates that similar results to those of Becker can be obtained by assuming that white capitalists aim at maximizing the income of the white community as a whole, or by assuming that public expenditure (e.g. on education) is allocated in a discriminatory way. Similarly, Alexis (1973) shows that "envy-malice" towards blacks may explain discrimination on the part of white employers who do not associate physically with black workers. His analysis indicates that, by adding the share of wage income received by white workers to white employers' utility functions, black wages are depressed below those of whites of equal productivity, even if employers have no actual aversion to working in proximity to blacks (Alexis, 1973, pp. 298-299).

Welch (1967) uses a model similar to that of Becker in order to show that discrimination may be more the result of the white worker's aversion to working alongside blacks than of the employer's taste for discrimination. For example, the productivity of a white supervisor may decline if he is required to work in association with a labourer of a different race. This would have particularly significant results if white and black workers were regarded as complements rather than substitutes (e.g. educated white labour and unskilled black labour may be treated as complements in production). Welch shows that
employers will integrate their workforces up to the point where the marginal efficiency gain resulting from the complementarity between human capital and "raw" labour is just equal to the marginal loss resulting from the inefficiencies of association between blacks and whites (Welch, 1967, pp. 229-30).

Arrow points out that the bulk of the earnings differential between blacks and whites in the United States is accounted for by differences in wage rates - partly because blacks are concentrated in low income occupations (job discrimination) and partly because they receive lower wages even within given occupations (wage discrimination) (Arrow, 1972a, p. 84). Most neoclassical theories focus attention upon the latter. But if we assume heterogeneous skills (jobs) and a corresponding dispersion of wages, then job discrimination can be collapsed into wage discrimination merely by defining each wage-skill level as an "occupation" (Cain, 1976, p. 1232). It is empirically difficult to disentangle pay differences arising from differences in job content from those arising out of pure wage discrimination, although in the case of South Africa (where most of the disparity in earnings is due to statutory and institutional discrimination against blacks in access to higher paying occupations), most wage discrimination reduces to job discrimination, with the important exception of the public sector where overt wage discrimination does exist at the lower levels of the occupational scale (Knight and McGrath, 1977, p. 256).
A full general equilibrium version of Becker's model of discrimination has been developed by Arrow (1972b; 1973). The supply of capital to each firm is assumed to be fixed, so that output varies with the quantities of white and black labour (W and B) employed. The supplies of W and B are perfectly inelastic. The production function is strictly concave and increasing in W and B. Arrow then proceeds to show that, if W is a positive argument in the employer's utility function and B is a negative argument, then in equilibrium white workers are paid more, and black workers less, than their (common) marginal product (Arrow, 1972b, pp. 187-188; 1973, p. 7). If all employers do not have identical utility functions, so that some discriminate to a lesser extent than others, competition will tend to eliminate discrimination in the long-run. Only the least discriminating firms survive because discrimination is like a tax to the employer in the sense that it shifts his demand for labour to the more costly component. Like Welch, Arrow incorporates the case of discrimination caused not by employer preferences but by the desire of white foremen to work with fellow white rather than black workers. It is assumed that the foreman's wage bears an inverse functional relationship to the proportion of whites in the total labour force, and it then follows that a white worker is worth more than his marginal product and a black worker is worth less to the firm even if the employer himself has no taste for discrimination.
Arrow's model implies that discrimination will tend to be diminished by competitive pressures in the long-run if it is caused by employer preferences. Similarly, long-run equilibrium under a regime of employee discrimination results in segregation with equalized wages. Cost minimizing firms will hire either an all-white or an all-black labour force, and pay the same wages in either case. However, if non-discriminating firms are unable to hire all the available black labour due to decreasing returns to scale, there could be a residual of blacks available to be hired by discriminating firms, so that the wage differential may persist without the occurrence of full segregation (Freeman, 1974, pp. 35-36; Addison and Siebert, 1979, p. 209). Arrow shows that, in general equilibrium, the presence of positive costs associated with adding new black and white workers to a firm's labour force means that discrimination on the part of white employees can result in the coexistence of wage differentials with some degree of segregation (1972b, pp. 194-198). In the absence of any such exogenously imposed transactions costs, however, Stiglitz (1973) has illustrated by means of a general equilibrium trade model that wage differentials cannot persist in the long-run, regardless of the source of discrimination. In the case of employee discrimination at its most extreme, white skilled workers will work only with white unskilled workers, and black skilled with black unskilled. This is analogous to a conventional trade model with zero factor mobility. But the factor price equalization theorem implies that trade in
commodities is a perfect substitute for movement of factors, so that the equalization of factor price ratios will still occur even in the case of complete segregation. If we assume that only white unskilled workers have an aversion to working with blacks, but white capitalists and skilled workers have no such taste, then we are left with a trade model characterized by some factor mobility. As long as all but one of the factors are mobile, factor price equalization will occur even in the absence of commodity trade (Stiglitz, 1973, pp. 288-289).

Arrow also postulates that employers' hiring practices may be based not on an exogenous "taste for discrimination", but on "perceptions of reality" (1972a, p. 96). For example, employers may possess the preconceived idea that the productivity of black workers is less than that of whites, so that they are only prepared to hire blacks at a lower wage. Phelps (1972) refers to this as "statistical discrimination" because it hinges on different statistical probabilities of black and white workers being qualified for a particular job. Skin colour may be regarded as a proxy for relevant data which is not sampled by means of screening, testing or other costly forms of personnel investment (Phelps, 1972, p. 659). If the employer knows that the statistical probability of a black being inadequately qualified for a particular job is greater than that of a white, the white wage rate will exceed the black wage.

If discrimination is to be explained by "beliefs about reality", it is necessary that we be able to account for these
beliefs. Arrow considers the psychological theory of "cognitive dissonance" (deriving from the work of Leon Festinger) as one possible way to achieve this. The theory maintains that behaviour becomes self-fulfilling: "... if individuals act in a discriminatory manner, they will tend to acquire or develop beliefs which justify such actions" (Arrow, 1973, p. 26). The problem remains, of course, to explain why rational economic agents would persist in such beliefs in the long-run if they were consistently proved to be erroneous (Marshall, 1974, p. 855).

The economic theories of race discrimination reviewed above suffer from two major shortcomings. The first derives from the long-run implications of these models: namely, that competition will ultimately eliminate the dispersion of wages and replace it with full segregation. There is no convincing empirical evidence to indicate such a tendency, which reflects upon the usefulness of this type of model. A second weakness of the Becker-Arrow analysis is attributable to the ad hoc nature of the discrimination coefficient. In the words of Marshall, this type of theory:

... becomes more nearly a theory of wages with an extra term - the discrimination coefficient - where the specification of the model predetermines the outcome, than a theory explaining the basic causal forces behind discrimination. The results of this formulation are true by definition - blacks must accept lower wages than whites in order to get jobs (Marshall, 1974, p. 862).

3The empirical issues associated with testing economic theories of discrimination will not be pursued here. The reader is referred to Marshall (1974) for a survey.
Nothing is explained about the underlying determinants or the nature of the discrimination coefficient itself. In order to enhance the explanatory power of the theory, the "taste for discrimination" needs to be treated as an endogenous consequence of rational economic behaviour rather than as an independent determinant of such behaviour. For example, restriction of access by blacks to education is likely to produce a pecuniary benefit for whites, who thereby improve their own job opportunities and incomes. This behaviour follows directly from economic motives and not from some exogenously imposed "taste for discrimination" (Addison and Siebert, 1979, p. 202).

The standard competitive model can, however, provide an appropriate price theoretic framework for investigating labour market discrimination, providing it is combined with an analysis of collective behaviour which emphasizes the ability of one group to use the instruments of the state in order to restrict the options available to another group. Such a model could also account for sudden and dramatic shifts in discriminatory

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In fact, there appears to be an inconsistency between Becker's early work on discrimination and his subsequent exposition of the "economic approach to human behaviour". The methodological cornerstone of the latter is the proposition that differences in behaviour can more usefully be explained by differences in objective constraints rather than in terms of changing tastes. (See the discussion of the "economic approach" in chapter 1.) Becker's previous analysis of discrimination, however, relies on an exogenous taste parameter, rather than on the nature of the constraints impinging upon the individual agent, in order to account for the extent of discrimination. The theory of apartheid presented in chapter 4 may be regarded as consistent with Becker's "economic approach" in the sense that it is an attempt to provide an explanation of the underlying economic motivation for racist behaviour.
behaviour which the standard theory has difficulty accommodating (Freeman, 1973, p. 286; 1974, pp. 33, 37). For example, Freeman maintains that:

Governmental discrimination in school spending, public services, and employment practices can be expected, in general, to produce income gains for the dominant group (1973, p. 295).

In these types of situations, maximization of the income of an enfranchised subset of the community produces discrimination in the provision of educational and other public resources, and offers a "discrimination-for-gain" rationale for policies such as those of the southern U.S. states or the South African government (Freeman, 1974, p. 40). Borcherding points out that race prejudice has often been used to effect a redistribution of wealth or resources from the politically powerless to the powerful (1977, p. 54). For example, the reason for race discrimination in the supply of public goods such as education is precisely that politics permit and encourage this kind of coercive income transfer. Prejudice and other barriers to entry into a group (such as skin colour, language, caste or religion) serve to reduce the costs to political entrepreneurs of organizing racial or ethnic coalitions and of monitoring (by means of custom and mores) the behaviour of those group members who may attempt to undermine its cohesion. Prejudice not only reinforces group solidarity, but can also function as a device to rationalize exploitation of another group by fiscal or other means (Borcherding, 1977, p. 55). It will be argued in section 3.4 below, and in chapter 4, that apartheid represents a set of
redistributive policies implemented in the interests of a politically powerful coalition, and it follows that race prejudice can usefully be regarded as a means of mobilizing and sustaining collective action aimed at maximizing the benefits accruing to the privileged group.

[3.3.2] Economic Theories of Apartheid and the South African Labour Market

The South African labour market is characterized by a large number of legislative and customary restrictions which affect both the occupational and spatial mobility of labour as well as the structure of wage rates. These institutional features of the labour market together comprise the most important economic manifestations of apartheid policy.5

5The actual legislative instruments of apartheid are described in appendix 2. Apartheid itself may be defined as the philosophical belief in, and political commitment to, the achievement of complete separation between the races in the social, economic and political spheres (Rhodie and Venter, 1960, pp. 22-23). Apartheid has evolved out of earlier versions of segregationism and racial differentiation which existed prior to the 1948 accession to power of the National Party, but differs in significant respects from these historical antecedents. For example, segregation represented the initial response of whites to the presence of an overwhelming black majority, and consisted primarily in an attempt to physically isolate white society from those elements of integration which were perceived as undesirable. The motives for segregation were given classic expression by the chairman of the Transvaal Local Government Commission of 1922, Colonel C. P. Stallard: "The native should only be allowed to enter the urban areas, which are essentially the white man's creation, when he is willing to enter and to minister to the needs of the white man, and should depart therefrom when he ceases so to minister" (Steenkamp, 1983, p. 68). According to Rhodie and Venter, segregation is a stage in the evolution of apartheid, and is not synonymous with apartheid (1960, p. 147). Industrialization and urbanization meant that segregationist policies became increasingly
A number of economic models have been developed to explain, or, in most instances, simply to characterize the racial wage differential, the inequality of access to certain occupations and the resulting racial distribution of income in South Africa, while at the same time attempting to accommodate the unique institutional structure of the economy.

Knight (1964) describes the South African economy as a classical Lewis-type "dual economy" in which an underemployed peasantry in subsistence agriculture provides an elastic supply of unskilled labour to the "capitalist" or modern sector. All black labour is assumed to be unskilled, and the black wage rate is determined exogenously by the average product in the reserves. All white workers are skilled, and the white workforce is always fully employed. A Robinson-Kaldor type Keynesian theory of income distribution is used to explain the share of profits in the modern sector, while the standard marginal productivity theory is invoked to determine the employment and wage ratios of white and black labour. The level of income, inadequate to the task of reconciling the needs of a burgeoning black working class with the desire of whites to protect their privileged position. It was precisely the economic integration of blacks which made necessary the replacement of segregation with a fully-fledged policy of apartheid. The latter embodies several revolutionary principles, the most important of which include "the recognition that the Bantu does have within him the capacity to develop to the same level of civilisation as the whites; the realisation that the Bantu cannot for ever form a labouring-class proletariat; and the idea that provision must be made for the expression of the reasonable national and political aspirations of the Bantu. The most important of these three apartheid concepts is undoubtedly that of granting home rule to the Bantu when his development justifies it" (Rhoodie and Venter, 1960, pp. 243-244).
black employment and the white wage rate are determined endogenously in the model. Knight shows that the white wage is both a rent secured as a result of the monopoly of skills, and also a reward for higher productivity at the margin. A dynamic version of the model indicates that growth in the modern sector benefits the two labour forces in different ways. White workers gain from higher wages due to increases in both black and white labour productivity, while black labour benefits only to the extent that growth provides more employment for the underemployed (Knight, 1964, pp. 308-309).

Knight's model represents a simple and useful framework upon which subsequent refinements have been built. By itself, however, it does contain a number of shortcomings, not least of which is the fact that it does not provide an explanatory theory of the apartheid system; rather, it consists of nothing more than an attempt to model the effects of apartheid on income distribution without addressing the underlying determinants of apartheid institutions. In addition, Knight assumes that all black workers are unskilled while all white workers are skilled, thus abstracting entirely from the possibility of job competition between black and white workers. He justifies this assumption on the grounds that the educational and social system and trade union policy (especially "rate for the job rules")

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6The insistence on "the rate for the job" on the part of white trade unionists has historically served to prevent the undercutting of white wages through the competition of cheaper black labour. See chapter 4, section 4.1.
have enabled the white labour force to monopolize skilled occupations (1964, p. 294). However, in a subsequent article with McGrath (1977), Knight has recognized that the assumption of a homogeneous black labour force, while perhaps a reasonable characterization of the 1950s and early 1960s, has become less appropriate in the light of the rapid industrial growth that has since occurred and the consequent acquisition of skills by increasing numbers of blacks.

Knight and McGrath (1977) regard the theory of "crowding" (first formulated by Edgeworth to explain wage discrimination between the sexes) as a useful description of the South African institutional framework. White workers are viewed as possessing sufficient political power to control access to skilled occupations, thereby "crowding" large numbers of blacks into the remaining unskilled occupations and depressing the unskilled wage rate. The scarcity of alternative opportunities for skilled blacks implies that the supply price of their labour is less than that of whites possessing identical stocks of human capital, which in turn implies that blacks can be remunerated at lower wage rates than whites in the same skill category. Thus, according to Knight and McGrath:

... the most plausible reason for discrimination in the South African case lies in the possibility of White workers raising their incomes by means of job discrimination and in their power to do so through various forms of collective action... Economic discrimination in South Africa is deeply rooted in the economic interests of White workers and is not merely the result of moral deviation or irrational racial prejudice (1977, p. 271).
The underlying determinants of the institutions of apartheid are thus firmly located within the economic interests of the white group (and specifically white workers) combined with their monopoly of political power and control over the coercive instruments of the state. The concept of apartheid as a rational economic response to objectively perceived constraints will constitute a vital component of the model of the apartheid polity to be developed in chapter 4, and we will return to this issue in the next section of this chapter.

While Knight and McGrath’s analysis recognizes explicitly the importance of political power and individual rationality (utility maximizing behaviour) to an economic explanation of apartheid institutions, it is primarily a model of income distribution (or, more specifically wage and job discrimination in the labour market) and is accordingly limited in its scope. However, attempts have been made by economists to construct more general explanatory models of the South African apartheid state and the political system as a whole. An important contribution in this respect is that of Porter (1978), who divides the "South African type" economy into three sectors: (i) the black reserves, where black labour is the only input and its marginal product is equal to its average product; (ii) white commercial agriculture which uses black labour and white-owned capital as the only factors of production; and (iii) industry, where white-owned capital is combined with both black and white labour. Porter then makes the fundamental assumption that the
South African type economy is essentially a market economy with the market constraints and policy parameters determined by whites and for whites. The South African state is thus of a distinctly predatory nature, and is therefore characterized by the inevitable contradiction between social product and the welfare of the ruling group (see chapter 2, section 2.2.4). It is this contradiction that has led to the popular view that apartheid policies are in some sense "irrational" and non-economic in that they do not always promote economic efficiency.

In Porter's model, the inconsistency between maximum societal output and maximum rulers' rents is manifested in the form of conflicting objectives on the part of different sub-groups within the white group. Specifically, white capitalists identify their interests with maximum output and economic efficiency, which maximizes the return to capital. White labour, on the other hand, is concerned with maximizing the growth of white employment relative to black employment and increasing the growth rate of the industrial sector relative to the agricultural sector. Thus the South African state must not only strive to maximize total white income, but also to reduce the level or growth of black employment outside the reserves (this policy is what Porter refers to as "apartheid") and to promote the growth of industry (which in turn facilitates a rapid growth of white employment opportunities) (Porter, 1978, p. 749). In order to achieve these diverse goals, the state uses
political instruments to manipulate such variables as the white and black wage rates and the share of jobs reserved for whites.

Even if the white population were sufficiently monolithic as to seek no goal other than the maximization of its own total income, the process of achieving this goal would not be straightforward if the desire to discriminate against blacks is taken as a given. We have seen this clearly demonstrated in Becker's model of discrimination as a form of economic segregation, in which the separate "sectors" (one white and one black) engage in trade (Becker, 1957; 1976). In a discriminatory equilibrium, the net incomes of both sectors are reduced, although the returns to white labour and black capital actually increase. Thus capitalists from the dominant group (contrary to Marxist and other radical views) will not benefit from prejudice and discrimination in a competitive capitalistic economic system (Becker, 1976, p. 19). In Porter's model of the South African type economy, maximization of total white income requires a non-discrimination equilibrium à la Becker, which is consistent with economic efficiency. If identical factors of production were priced identically, the private cost of factors would equal their social opportunity cost (Porter, 1978, pp. 747-748). However, there is a tradeoff between white workers' income and white capitalists' income which reflects the tradeoff between the economically efficient allocation of resources and that which is "politically" optimal. Porter refers to this dilemma as the ultimate paradox of white policy: namely that the demands of
internal politics evoke a rhetoric of "separate development", while the continued exploitation of blacks requires their integration (1978, p. 754). Divergent goals among the different sub-groups within the white sector become even more pronounced when the apartheid state also attempts to promote the growth of the industrial sector relative to agriculture and to restrict the mobility of blacks between the reserves and the capitalist economy. For example, an increase in the white wage rate may appear to benefit white workers, but it will also reduce the ratio of industrial to agricultural output, reduce white industrial employment and reduce the rate of return to industrial capital (Porter, 1978, p. 750).

While Porter's model successfully characterizes a number of aspects of the South African state - especially the conflict between economic efficiency and apartheid policies - it does suffer from several major shortcomings. For example, Porter does not distinguish between different skill categories of white and black labour, but treats all labour as homogeneous. This is unrealistic in the light of the fact that much discriminatory practice takes the form of restricting the access of blacks to higher levels of education (Knight, 1964, p. 294). Porter postulates constant returns to black labour in the reserves, whereas the historical evidence points to diminishing returns as the land constraint has become progressively more binding (Houghton, 1973, pp. 70-71; Watrass, 1982, pp. 98, 193-195; Lundahl, 1982, p. 1171). In addition, Porter's model is
explicitly ahistorical, in the sense that it does not provide an explanation of the historical evolution of apartheid institutions. In an attempt to remedy these problems, Lundahl (1982) develops an analysis of the "South African type" economy in which he distinguishes between skilled and unskilled labour, endogenizes the wage rate and divides the history of the economy into three stages. The first stage runs from the initiation of colonial contact until the discovery of minerals. During this period the economy is divided into two sectors - white and black agriculture - and the white group uses the political instruments of land alienation and European immigration policy in order to maximize white incomes. The second stage consists of the period from the discovery of minerals to the end of the Second World War, during which both black and white labour is divided into skilled and unskilled categories. The white group aims to increase white agricultural output, industrial output, the rental rate on white-owned agricultural land, the rate of return on capital in industry, and the skilled and unskilled white wage rates. Their policy instruments include land alienation, job reservation, and control over the amount of skilled black labour employed in industry. Again, these goals are not mutually consistent. For example, in order to solve the "poor white" problem, the so-called "civilized labour policy" (essentially a system of job reservation) was adopted to raise the level of employment of white unskilled labour. However, the pursuit of this policy was detrimental not only to blacks, but also to
industrial producers and skilled white workers.

The third and final stage identified by Lundahl is the post war period, by which time the final division of land between blacks and whites has been established (so that land alienation ceases to exist as a policy instrument) and unskilled whites no longer comprise a significant component of the labour force. The white group aims to maximize the same objective function as in the immediately preceding period of development, except that now the only policy instruments available to it are the number of black skilled workers employed in industry and the number of black workers allowed to migrate into the white sector of the economy from the reserves or "homelands". Once again, conflicts of interest arise between subgroups within the white sector. Lundahl in fact arrives at the same basic conclusion as Porter - namely that the achievement of maximum income for the white group as a whole would be facilitated by increasing the influx of blacks from the homelands to the "white" economy, yet the policies of apartheid or "separate development" have aimed at just the opposite (Lundahl, 1982, pp. 1177-1178). Lundahl therefore draws the conclusion that any explanation of apartheid must be non-economic:

...it may thus very well be the case that the root cause of the segregation of blacks from whites should not be sought in economic rationality...(Lundahl, 1982, p. 1178).

According to Lundahl, the economic "perversity" of apartheid can only be comprehended on the grounds that it achieves such supposedly "non-economic" purposes as reducing political and
social turmoil and increasing the security of whites. Others have claimed that the method of neoclassical economics is inherently unable to provide an explanation of apartheid practices. For example, Knight and Lenta write:

Utility-maximization models abstract from the most important determinants of (labour) migration. These are to be found not by examining the logic of individual choice but rather by explaining why people face the choices that they do. This requires a study of the historical evolution of the labour reserves, giving prominence to variables which are conventionally regarded as exogenous and given (1980, p. 195).

However, we will argue that it is possible to account for apartheid institutions without violating the principle of individual rationality if we incorporate these so-called "non-economic" factors directly into the individual decision making process in the form of transactions costs associated with alternative structures of property rights. We will follow North in treating the costs of enforcing and maintaining a particular assignment of rights as an important constraint upon the ability of the ruling group to achieve maximum societal output (see chapter 2, section 2.2.4).

(3.4) The Rationality of Apartheid Institutions

Liberal economists, historians and other social scientists have traditionally argued (in the spirit of Jeremy Bentham, J. S. Mill and Adam Smith) that free economic competition is an essentially equalitarian force, and that the maintenance of dirigiste state policies designed to discriminate against one group in favour of another is indicative of economic
irrationality in the sense that it results in a less than optimal allocation of resources. The most influential proponent of this view within the South African literature is Hutt (1964), who writes:

The lesson of history, explained by classical economic analysis, is that disinterested market pressures, under the profit-seeking inducement, provide the only objective, systematic discipline that would dissolve traditional barriers and offer opportunities irrespective of race or colour (p. 73).

In a multiracial society, according to Hutt, the market is colour-blind, and it serves to dissolve customs and prejudices which would otherwise restrict the ability of the underprivileged to contribute to, and share in, the common pool of output. In fact, Hutt argues that the advancement of blacks which has historically occurred in South Africa has been the result of limited victories of the "profit incentive" over interventionist, collectivist government policies (1964, p. 91). These policies are the outcome of atavistic "colour prejudice", which in turn derives from an historical heritage in which blacks traditionally were "more primitive" in their behaviour patterns and occupied low positions in the economic and social hierarchy. The perpetuation of this prejudice into the modern era is, according to Hutt, directly attributable to the nature of Afrikaner social psychology, and particularly Calvinism which Hutt maintains is intrinsically opposed to the "capitalist spirit" and is based on a fatalistic respect for historically determined (and therefore heaven-ordained) race and class structures. This attitude leads to economic race discrimination.
and injustice, which in turn reinforces the survival of prejudice (Hutt, 1964, pp. 30, 44). Hutt's work has proved to be extremely influential:

Most major studies on South Africa reflect the assumption that an essential contradiction exists between an irrational race policy and the requirements of a rationally organized, expanding industrial society (Adam, 1971, p. 145).

The irrationality of apartheid implies that it imposes severe costs on the economy. The liberal school maintains that apartheid is inherently incompatible with economic growth (i.e., it reduces the growth rate below some hypothetical "potential" which presumably could be attained in the absence of all apartheid institutions). According to Houghton (1973), apartheid serves to enrich the white minority, but at the expense of "economic progress". In his words:

... white voters have used their monopoly of political power to entrench their economic position by restrictions on the movement and advancement of African workers by maintaining differentials in educational opportunities and by legislative methods to give the whites a monopoly of certain kinds of jobs. These contrived scarcities and imperfections in the labour market have a corrosive effect upon economic growth, and prevent optimum resource allocation (Houghton, 1973, p. 252, emphasis added).

Similarly, Horwitz argues that the white group, by virtue of its sole possession of the franchise, was historically able to use its political power to entrench its economic ascendancy, even though by doing so it was seeking political institutions that would retard South Africa's future development (Horwitz, 1967, p. 9). He regards South Africa's economic history as essentially one of conflict between the dictates of the economy on the one
hand, driven by the needs of a growing capitalist system, and
the polity on the other, driven by the ideology of white
supremacy and Afrikaner nationalism (Horwitz, 1967, p. 299;
Nattrass, 1982, p. 72). A corollary to this approach is the view
that any sustained economic growth which is allowed to occur
will automatically attenuate the effectiveness of state
restrictions and irrational ideologies. It is claimed that
growth alone can play a role as a liberalizing element, as
whites trade off political supremacy considerations in favour of
increased prosperity (Bromberger, 1974, pp. 70-71; Nattrass,
1982, p. 31).

The liberal perspective is valuable in so far as it draws
attention to the (not inconsiderable) efficiency costs of the
apartheid system. These costs play an important role in the
model presented in chapter 4, and will be discussed in greater
detail there (see section 4.2). To the extent that apartheid
consists primarily in state regulation of the labour market in
the interests of a minority group of participants in that
market, there can be no doubt that it does result in a reduction
in output consequent upon a misallocation of resources. It is
more useful, however, to treat the individual decision maker's
choices as rational responses to economic constraints rather
than ascribe to him an irrational set of behavioural norms which
would not be susceptible to economic analysis.

In any case, it is by no means clear that the application
of apartheid policy has always been detrimental to the growth of
the economy. Marxist authors argue that apartheid is neither inefficient nor irrational since it has facilitated an increase in the rate of exploitation of black workers in the interests of rapid capital accumulation (Wolpe, 1972, pp. 235-236). According to the Marxist view, race discrimination was both introduced and fostered over the past century precisely because it was highly functional to economic progress through the capitalist mode of production. Contrary to Norwitz's contention that the goals of the polity and economy are inherently opposed, the Marxist literature maintains that the expanding capitalist sector of the South African economy has successfully used the polity to reinforce the position of the capitalist class, and that the creation of a "white worker elite" should be regarded as a by-product of this fusion of the economy and polity (Wattress, 1982, pp. 32, 73). It is also pointed out that South Africa has enjoyed an extremely high rate of economic growth since 1948 (superseded in the 1960s only by that of Japan) despite the continuing application of apartheid policy (Legassick, 1974, p. 6). The existence of this apparent contradiction is often attributed to the flexibility and pragmatism displayed by the South African state in its enforcement of the policies of apartheid. Houghton himself observes that "in periods of rapid economic growth the restrictions on non-white employment tend to be relaxed owing to the need to maintain output" (1973, p. 151). In such boom periods, blacks typically benefit from some upward occupational mobility, moving into skilled jobs vacated by
whites. Houghton suggests that the rapid growth after the Second World War was only possible because of "a tacit relaxation of restrictive practices" (1973, p. 153). A similar point is made by Horwitz, who maintains that the very arbitrariness of industrial relations legislation necessitated that provision be made for the granting of individual exemptions from certain ministerial orders (1967, p. 324). According to Rhodie and Venter, it is important to distinguish between the "apartheid idea", which they define as the ideological basis of the Afrikaners' racial philosophy, and the actual measures of apartheid policy through which the fundamental principles of the apartheid idea are crystallized in the form of statutes, regulations, etc. (1960, pp. 21-22). Since apartheid policy is the practical, concrete expression of the ideology of apartheid, it is also likely to display greater pragmatism. 7

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7 A clear illustration of the flexibility with which apartheid policy has been applied is evidenced by the fluctuating number of minimum wage determinations issued by the statutory Wage Board and the number of job reservation determinations made in terms of Section 77 of the Industrial Conciliation Act of 1956. (For a more detailed description of apartheid legislation and the pragmatic evolution of apartheid institutions, see appendix 2.) The absence of any active policy on the part of the Wage Board from 1949 to 1957 was indicative of an attempt by Nationalist politicians to suppress effective black worker organization. Over this period black real wages fell by 1%. But from 1957 to 1959, the number of Wage Board determinations increased dramatically and black real wages rose by 12% (Griffiths and Jones, 1980, p. 101). Section 77 of the Industrial Conciliation Act has also been applied in a pragmatic fashion. Adam maintains that the traditional industrial colour bar could only be sustained by means of large-scale exceptions (1971, p. 149). The government itself has claimed that the job reservation determinations under Section 77 of the 1956 Act were intended only to provide for "orderly change" within the labour force. It was envisaged that these determinations would gradually be relaxed to allow black workers into occupations
It will be shown in chapter 4 that it is possible to construct an explanatory model of the apartheid state which is founded on the fundamental economic assumption of rationality on the part of all agents. Political interference in the operation of markets is generally most detrimental to the least favoured groups in society (Demsetz, 1965). In South Africa, the monopoly of political power has historically enabled white workers to extract rents in the form of high wages and secure employment by harnessing the instruments of the state to their cause. "To protect their wages White workers have an interest in erecting and maintaining barriers to Black entry, whether they be barriers to education or training, or statutory or customary job reservation" (Knight and McGrath, 1977, p. 262). According to Bromberger, apartheid consists in an attempt to protect the unequal distribution of wealth that has been created historically and the resulting distribution of income, which is at least partly dependent for its preservation on legal and conventional restrictions on labour competition (1974, p. 105).

(cont'd) vacated by upward-mobile whites, and that the racial labour pattern would be "unfrozen" in an evolutionary manner. Where the practical enforcement of a proclamation presented difficulty, exemptions were readily granted to individual firms, occupations or geographical regions. For example, during 1971, 1,776 exemptions were granted, covering 4,686 workers (Griffiths and Jones, 1980, p. 171). A further indication of the flexibility of the apartheid system is provided by the breakdown of much of the statutory job discrimination in 1978-79. This occurred primarily as a result not only of the government's desire to appease black aspirations in the wake of the 1973 strikes and the 1976 Soweto riots and to yield to international pressure (in the form of threatened trade boycotts, sanctions and disinvestment), but also as a result of severe skilled manpower shortages (Griffiths and Jones, 1980, p. 186).
Public choice theorists have shown that political pressure to institute an ascriptive and inefficient government policy that creates benefits for a particular privileged group imposes a cost that is diffused over the entire population. If the gains from such a policy are concentrated upon a relatively small number of beneficiaries, a great deal of resources will be allocated to securing its initial adoption and lobbying against any proposals favouring its abolition (Lee and Orr, 1980, pp. 114-115).

The white group does not comprise a monolithic political entity, however, since the interests of white employers are not necessarily consistent with those of white workers. Specifically, employers can be expected to favour the removal of artificial barriers which raise white earnings, and to press for the payment of market wage rates and the advancement of blacks into skilled jobs (Knight and McGrath, 1977, p. 263). White employers are in competition not with black labourers, but with other (often foreign) producers, and therefore it is unlikely that employers, as a group, have ever comprised a principal source of the racial exclusion and discrimination suffered by blacks (Olson, 1982, pp. 163-164). The complex interaction between white worker and employer interests will be made more explicit in the formal model presented in chapter 4.

It is conceivable, however, that employers may voluntarily conform to statements of official government policy and maintain discriminatory practices even when not statutorily required to do so, in order to avoid offending and provoking their white employees or the government (Savage, 1977, p. 292).
As pointed out in section 3.2 above, the concept of 'ethnicity' and 'ethnic mobilization' advanced by Adam and Giliomee (1979) provides a useful sociological backdrop to the analysis which will be undertaken in the following chapter, since it is compatible with the type of approach to be used. According to this perspective, a homogeneous ethnic minority (Afrikaners) within a heterogeneous society organizes its political and social identity in such a way as to capture the maximum share of resources. Adam and Giliomee describe in some detail how, historically, Afrikaners were effectively mobilized as a group (irrespective of class divisions) by an ethnic oligarchy of Afrikaner nationalists. This mobilization was achieved by deliberately developing an awareness of common language, cultural heritage and other manifestations of 'volk identity' in order to generate a perception of 'ethnic belonging' strong enough to breach class and occupational lines. The purpose of the nationalists in this endeavour was to ensure survival of the Afrikaner group and its security. According to this view, ethnic identification, or racism, emerges out of the efforts by an underprivileged group to improve its position through collective mobilization or, conversely, the efforts of a superordinate group to preserve its privileges by exploiting subjected groups. "In short, racialism is an expression of specific interests" (Adam, 1971, p. 20). Thus race prejudice promotes group cohesion and prevents any dilution of group membership in order to facilitate successful collective action.
One of the most important outcomes of this mobilization process in the South African context has been the increased economic strength of Afrikaners, indicated by the growth of indigenous Afrikaner capital holdings in mining and manufacturing, as well as the capture of the state bureaucracy by Afrikaners (O'Maera, 1977, pp. 174-179; Adam and Giliomee, 1979, pp. 83-127, 145-176). Divergent economic interests continue to exist within the white group, however, and even within the Afrikaner subgroup. The latter now contains "a mature Afrikaner bourgeoisie" which identifies itself with the laissez-faire labour policies of English speaking capitalists, with whom it shares similar interests in "curbing the historical monopoly of expensive white labour" (Adam and Giliomee, 1979, p. 182).

The costs as well as the benefits of apartheid institutions need to be considered in order to analyze the nature of social change. The rising costs of privilege maintenance "must not be calculated only in narrow financial terms. In a wider sense, costs result from threats and the precautionary defense of a system" (Adam and Giliomee, 1979, p. 1). The relationship is not of a "zero-sum" nature: if costs are rising for the ruling group, it does not mean that they diminish for the subordinates whose militancy has its own cost structure. Ultimately, apartheid remains a viable social system only so long as its

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9See section 3.3.1 above.
benefits to the relevant decision makers exceed its costs.

In the next chapter we will treat the apartheid system explicitly as a rational response to structural exigencies, rather than as a manifestation of an irrational, atavistic racism. In doing so, we are following the spirit, if not the method, of such economic analyses as those of Knight and McGrath (1977), Porter (1978) and Lundahl (1982), as well as that of the sociological concept of ethnicity as proposed by Adam and Giliomee (1979). The latter authors point out that, although much of South Africa’s recent economic history appears as the subjugation of laissez-faire economic policies to the ideological designs of Afrikanerdom, yet a more thorough investigation reveals that "a rational calculation of ethnic interests rather than ideological zealotry underpins the exercise of power by Afrikaner nationalists" (1979, p. 123). It is with this view in mind that we proceed in the next chapter to suggest an economic model which is capable of reconciling the principle of individual rationality with the existence of apartheid institutions.
IV. AN ECONOMIC MODEL OF THE SOUTH AFRICAN POLITY

(4.1) Introduction: Apartheid as a Rational Economic Response

We have seen in chapter 2 (section 2.2.3) that a necessary precondition for the evolution of democratic constitutions along the lines suggested by "contractarian" theories of public choice (such as those exemplified by Buchanan and Tullock's analysis of decision rules or Rawls' conception of justice) is that there be no clearly predictable bases for the formation of permanent coalitions. Thus Buchanan and Tullock concede that their model of the constitution-making process

...has little relevance for a society that is characterized by a sharp cleavage of the population into distinguishable social classes or separate racial, religious, or ethnic groupings sufficient to encourage the formation of predictable political coalitions and in which one of these coalitions has a clearly advantageous position at the constitutional stage (1965, p. 80). A situation may arise in which separate classes or interest groups are so solidified that no "democratic" constitution of the Rawls-Buchanan-Tullock type can be expected to be chosen for the community. In the case of South Africa's "racial autocracy", Adam (1982) maintains that the degree of political integration which has been achieved in the first instance is so small that the state apparatus does not aim at ensuring administrative rationality but rather "ethnic privilege".
In fact, Adam categorizes the South African state as an "ethnic state", which differs in its characteristics from both a classical liberal state and a Marxist class state:

For the ethnic state, legitimacy concerns are reduced to self-preservation. What furthers the ethnic group in power is legitimate, what risks its hegemony may not be entertained (Adam, 1982, pp. 2-3).

In the terminology of chapter 2, the ethnic state is essentially a predatory or "interest group" state. Its chief purpose is to maximize the utility of the ruler or the members of the ruling group. As pointed out by North (1981, pp. 10, 16n), this goal will not necessarily coincide with that of maximum societal output or economic efficiency, because of the existence of positive transactions costs associated with enforcing, monitoring and policing alternative systems of property rights. These costs are an important consideration in our analysis of the particular institutional structure which has emerged in South Africa in response to the objectives and constraints facing the ruling group. In order to obtain compliance, the ethnic or predatory state must exercise power legally:

Arbitrary terror would increase the costs of coercion and motivate more resistance (Adam, 1982, p. 3).

It is necessary at this stage to draw a sharp distinction between the concepts of political "power" and political "authority". Power may be defined as force which is exercised through the medium of law and with its sanction. Authority is power which is endowed with some form of legitimacy and is
perceived as such by political agents. The South African ethnic state may be regarded as maintaining its rule illegitimately (at least in the eyes of the majority of its black subjects) with the use of law. In other words, although it is not perceived to constitute a legitimate political authority by the majority of its citizens, it does operate within an elaborate institutional infrastructure of legislative and judicial conventions. This system in turn may be treated as a rational response to the costs and benefits associated with various alternative allocations of property rights. We use the term "apartheid polity" as a summary description of this highly complex and continually evolving institutional framework, and it is the development of this set of institutions with which we are concerned.

An extremely popular but misleading view of apartheid is that it is nothing but an "institutionalized irrationality" or the "pursuit of an ideological dream" (Adam, 1982, p. 12). As pointed out in chapter 3, many historians and social scientists of the "liberal" or "classical" school have regarded apartheid

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1In a situation of "force", individual A achieves his objectives in the face of B's noncompliance by stripping him of the choice between compliance and noncompliance (Lukes, 1974, pp. 17-18). Pluralist political theorists regard "power" as synonymous with "coercive influence". In other words, power consists of A's ability to induce B to do something he would not otherwise do by promising to make him better off than he is now or threatening to make him worse off (Dahl, 1963, p. 50). Political authority is exercised when B complies because he recognizes that A's command is reasonable in terms of his own values - either because its content is legitimate and reasonable or because it has been arrived at through a legitimate and reasonable procedure (Lukes, 1974, p. 18).
as an atavistic, irrational body of doctrine whose motivations are explicitly non-economic (and are indeed directly orthogonal to any concept of economic efficiency). But we have also noted that there exists no stronger testimony to the fallacy of this view than the extreme pragmatism of the apartheid state in response to changing economic constraints. The very concept of ethnicity has demonstrated a great deal of flexibility and is subject to continual redefinition in accordance with the "tactical needs of the powerholders" (Adam, 1982, p. 3).

We must now address the question as to how the apartheid polity can be explained as the outcome of individual utility maximizing choice processes. We have already established that any such explanation must be premised upon a predatory or interest group theory of the state since the contractarian approach by itself is not consistent with a highly polarized and heterogeneous citizenry. Since our model is concerned only with the period after 1948 (i.e. the period immediately following the formal establishment of the apartheid system), we are not directly concerned with the circumstances which originally produced the divisions between black and white, and thus prevented the development of an integrated "nonracial" society. However, it is important to our model that we be able to characterize the manner in which the ruling group benefits from the existence of the apartheid polity. Therefore, it will be helpful to discuss briefly the economic forces which helped to shape the long
history of pre-apartheid segregationist policy in South Africa, and to speculate upon the reasons for the original emergence of a racially dichotomized society.

Throughout its history, South African commercial agricultural and mining production have been plagued by a shortage of labour relative to land (Wilson, 1971, pp. 117-119). This was true of the British colonies as well as the Boer republics of the nineteenth century, and continued well into the period of Union (Mattrass, 1982, p. 66). The existence of a viable and flourishing black peasant agricultural sector meant that high wages were necessary to bring forth the required amount of labour. It is a well documented fact that these wages were considerably reduced by using the coercive political instruments of the state to generate a labour force for the commercial farming and mining sectors (Hutt, 1964, p. 49; Wilson, 1971, p. 121; Houghton, 1973, p. 23; Mattrass, 1982, p. 59).

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2Houghton points out that even in the early days of the first Dutch settlement at the Cape, there was an acute shortage of labour induced by the reluctance of the Hottentots to work for the white settlers. This shortage led to the introduction of slavery at the Cape (Houghton, 1973, p. 2). In the subsequent periods of white territorial conquest and settlement, Africans were forced into circumscribed areas, while the regions occupied by whites were characterized by abundant land and capital and scarce labour. This situation of labour shortage continued into the twentieth century, and was so acute immediately after the Anglo-Boer War that Chinese indentured labourers were imported in 1904 in order to facilitate the expansion of gold output (Houghton, 1973, pp. 23, 145).

3Early examples of such legislation were the hut taxes imposed on Africans living on Crown Land in the colony of Natal in the latter half of the nineteenth century, and the Glen Gray Act passed in 1894 by the Cape parliament which imposed a labour tax
This practice was not limited to South Africa, but was common throughout colonial Africa. A combination of tax policy and direct land expropriation effectively diminished the African's ability to engage in subsistence or peasant farming (Seidman, 1973, p. 562). Labour coercion can take numerous forms, of which slavery is the most extreme. In all cases, legislation is used to force labourers into a different pattern of labour force participation than they would undertake if their options were not reduced (Engerman, 1973, pp. 54-55). A system of forced labour is most likely to arise in "frontier economies" where land is so abundant as to be effectively "free", and labour is relatively scarce. In such a situation, landowners must impose restrictions on the mobility of labour in order to obtain rents

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3(cont'd) on African residents of the Glen Gray district. The first instance of land being set aside exclusively for black occupation was the "native reserve" established by Sir Harry Smith, governor of the Cape colony, for the Mfengu community. Natal was quick to follow suit, and by 1849 seven African reservations had been established in that colony (Nattrass, 1982, p. 190). The 1913 Land Act ended the system of squatting and share-cropping by Africans on white farms, reducing both groups to the status of labour tenants and formally institutionalizing the policy of racially segregated land ownership rights. This act, together with the 1936 Bantu Trust and Land Act, limited African rights of access to land to some 15 million hectares, or 14 percent of South Africa's total land area (Nattrass, 1982, pp. 71, 191-192). The perceived need for state intervention in the generation of a black labour force became even more acute after the discovery of minerals. Labour comprised a major proportion of the total production costs of the gold mines. Increases in wage rates could not be passed on in higher output prices because these were fixed by the world market, and capital costs were likewise determined exogenously by supply and demand conditions in world money markets. Thus mining entrepreneurs had a strong interest in pressuring the political authorities to employ any means possible to prevent wage costs from rising (Nattrass, 1982, pp. 66-68).
from their land. In other words, the existence of free land implies that there is an incentive to ensure a labour supply by restricting potential workers from entering into self-sufficient production. Rather than competing with each other to attract workers, landowners will enter into some sort of cartel agreement:

The cartel response is a set of institutional arrangements permitting forced labour, and it is important to examine the ability of the cartel to form and hold together, as well as the nature of the political system which permits these institutional innovations to be enforced (Engerman, 1973, p. 59).

The pre-industrial South African state represented the interests of just such a cartel. African land rights and agricultural policies were shaped in such a way as to maximize the flow of black workers to the (white) commercial farming and mining sectors.

The rate of investment in a Lewis-type "dual economy" is determined by the supply price of labour which is transferred from the subsistence sector to the modern sector, and by the price of food and other agricultural products which are used as inputs in the modern sector. Increases in rural productivity will result in increases in the modern sector real wage through the effect on the supply price of labour, and may therefore reduce the rate of industrial growth. *

*It has sometimes been supposed that, in order for total subsistence output to remain unaffected by the withdrawal of labour to the modern sector of the economy (i.e. in order for a true "surplus labour" situation to prevail), it is necessary to assume that the marginal product of labour in the subsistence sector is zero. Sen (1966) shows, however, that, in a competitive model of rational labour allocation, the existence
Mattrass maintains that a straightforward Lewis model of this type is not applicable to the South African case because of the success of white agricultural interests in dichotomizing the agricultural sector on the basis of race and thus separating the sources of supply of food and labour. Once agriculture was divided in this way, living standards of those supplying food (white farmers) could be increased along with living standards in the industrial sector without affecting the supply price of labour migrating from the black reserves to the cities. Conditions in subsistence agriculture improved in the late nineteenth century, but declined again in the early twentieth century. Output in these areas virtually stagnated after 1924, and once apartheid laws affecting the mobility of black labour became fully operational, real income in the reserves began to decline to the point that they became net importers of food from the white agricultural sector.

At this stage, even though the maintenance of the labour reserve sector was no longer costless to the growing modern economy, its continued existence still exerted a downward pressure on modern sector wages, to the extent that the sector was able to provide social security in the form of homes for the young, the aged, the sick and the unemployed, which would otherwise have to have been provided by the industrial sector (Mattrass, 1982, p. 6)

*(cont'd) of surplus labour requires only that the marginal utility of income and the marginal disutility of work both be constant over the relevant range. This will ensure that the real labour cost is insensitive to a withdrawal of a part of the population. If some peasant output is marketed, the conditions for the existence of surplus labour become even less exacting, since in this case a decline in the peasant workforce due to out-migration may induce a shortage of marketed agricultural goods, and the consequent price rise will produce a positive output response (Sen, 1966, pp. 429, 432).*
Implicit in this argument, of course, is the assumption that income-earning opportunities for black family members would be more limited in the industrial sector than in the reserves. The more underdeveloped the reserve economies, the greater the amount that black workers are forced to remit in order to support their families (Enke, 1962, p. 41). The decline in alternative income generated by reserve agriculture may partly account for the rise in real black wages in manufacturing during the post-war period (Knight and Lenta, 1980, p. 174).

At the same time, industrial and labour legislation was designed in the interests of the white workforce. This situation may be regarded as the result of three factors: (i) the existence of an initial disparity between skilled and unskilled wages due to the inelasticity of supply of human capital in South Africa and the necessity to import skilled labour from Europe (Houghton, 1971, p. 19); 5

5Hutt points out that white workers demanded a higher reservation wage than their black counterparts due to the better alternative opportunities available to them: "...knowledge of mining employment opportunities spread in the tribal regions so that, despite the increasing demand for labour through the beginnings of the gold-mining development, a growing inflow of unskilled Africans had by the middle 1930s brought down the market price for black labour to a small proportion of the rate needed to attract whites. This disparity persisted through the gold-mining era and has lasted (for non-market reasons) until today" (Hutt, 1964, p. 48). Nattrass likewise maintains that the foundations for the current inequality of racial income distribution were laid in the early days of diamond and gold mining. The benefits of the diamond mines were unequally distributed, not only because of the relatively high rate of return on capital, but more importantly because of the shortage of skilled labour and abundance of unskilled labour, and the fact that whites possessed an almost total monopoly of skills (Nattrass, 1982, p. 135). The discovery of gold and the
(ii) the introduction of closed-shop craft unionism among the skilled labour force as a result of the strong influence of unionized British immigrants (Hutt, 1964, p. 59); and (iii) the restriction of the political vote to whites, either explicitly in the case of the Boer republics or implicitly by means of property qualifications in the Cape and Natal (Kuper, 1971, pp. 427-437). The combination of these three pre-conditions enabled the white labour aristocracy to ensure the continuation of its high wages and full employment by excluding blacks from skilled positions. Trade union policies such as "the rate for the job" and strict control over apprenticeship practices served to prevent the undercutting of white wages by black competition.

In addition, the white monopoly of political power enabled white

5 (cont'd) development of the Witwatersrand mines further intensified the tendency to racial income inequality. "From the beginning gold mining required large inputs of capital and technology and as a result Blacks did not emerge either as mine-owners or as part of the skilled workforce" (Ibid., p. 156). We have already noted that the expansion of the gold mines was particularly dependent upon the availability of low-wage labour, since both the gold price and the price of capital goods were determined by world market conditions and were therefore outside the control of the mining companies (Bromberger, 1974, p. 95). In addition, it was the diamond and gold mining industries that provided an ideal breeding ground for a trade union movement dedicated to resist the fragmentation of craft operations and the substitution of semi-skilled or unskilled blacks for white workers (Mattress, 1982, p. 156).

6 The discriminatory effect of "rate for the job", minimum wage laws and other legislative interferences in the labour market derives from the fact that these measures essentially prevent non-preferred individuals from offering to compensate discriminating employers by providing their services at lower wages. "Since no wage differential can be offered, since no cost can be imposed on employers who discriminate, fewer persons who are non-preferred will be hired for the jobs they seek" (Demsetz, 1965, p. 278).
workers to prevent the dilution of skilled jobs into semi-skilled components, or the training of blacks for skilled occupations, by imposing direct legislative barriers (of which the Transvaal Ordinance No. 17 of 1904 is an early example) (Houghton, 1973, p. 146). Prior to the Rand Rebellion of 1922, white labour in the Transvaal regularly confronted mining entrepreneurs who were primarily interested in replacing high cost white workers with low cost black labour in order to reduce average production costs. The rebellion staged by the white workforce in 1922 was crushed with the help of government troops (Houghton, 1971, p. 27). However, the 1924 election resulted in the accession to power of a coalition of white labour and Afrikaner agricultural interests. This "Pact" government introduced legislation which was to form the basis of the present apartheid system (Houghton, 1971, p. 30). (See appendix 2 for a more detailed description of the legislative instruments of apartheid policy.) Wattrass points out that:

Had black workers also held the franchise, there is little doubt that white labour would have been unsuccessful in its attempts to reconstitute itself as a labour aristocracy. It is also not at all certain that white labour would have succeeded in persuading the capitalist class to see them as separate from the black, had they not managed to turn economic defeat in the labour market into political success at the polls. The fact that white labour held the vote and black labour did not and indeed still does not, has undoubtedly helped to shape the present structure of South Africa's labour market (Wattrass, 1982, p. 76).

The origins of geographical separation and the accompanying rigorous control over labour mobility can thus be attributed in the first instance to the "frontier" nature of the South African
economy and the ability of those groups of individuals possessing a comparative advantage in the exercise of force to extract rents from the remainder of the population by means of a "forced labour" policy. According to de Kiewiet, the "leitmotiv" of all South African history is the contact between black and white which began at the eastern frontier of the Cape Colony in the last few decades of the eighteenth century (1975, p. 43). This contact resulted not in blacks being pushed further into the interior or in their decimation by white military superiority. Instead it took the form of "maintaining them within or adjacent to the areas of European occupation, in various guises, as labour tenants, squatters or as inhabitants of overcrowded areas" (Kahn, 1942, p. 41). The subsequent crystallization of this "frontier spirit" has led to the absorption of blacks into the white economy as a dominated, politically powerless labour force.

As noted in chapter 3 (section 3.4), the theory of rent-seeking leads us to expect that political pressure to institute an efficient policy that yields benefits to a specific group will be more effective the smaller the beneficiary group relative to the losing group. This is because the benefits are highly concentrated among members of the minority group, whereas the losses are diffused over a larger number of individuals; and it explains both the initial success of the beneficiaries in securing the adoption of such policies and the strong political resistance to their repeal (Lee and Orr, 1980, pp. 114-115).
Olson's theory of collective action provides an analytical tool which is helpful in explaining the initial emergence of a segregated society in South Africa. A "distributional coalition", in Olson's terms, is a collusive organization designed to seize the largest possible share of social output for the benefit of its members, regardless of the resultant loss in efficiency which accrues as a cost to society as a whole. The redistribution occurs in a manner analogous to the cartelization of an industry (Olson, 1982, pp. 44-47). In order for such cartelistic gains to be preserved in the long-run, however, it is necessary that a clear demarcation between the favoured and non-favoured groups be maintained. In the South African context, any tendency for the black group to be absorbed or assimilated into the white group would imply that wage differentials could not be maintained and the cartel rents would be dissipated. Thus any group difference (such as race) which facilitates exclusion from a distributional coalition will be advantageous to the members of that coalition (Olson, 1982, pp. 164-165).

In general, force and "positive inducements" (primarily money wages, attractive working conditions, etc.) may be regarded as substitutable inputs into the production of labour-effort. The rate of substitution between the two is determined by cultural factors such as mores, expectations with regard to income levels, opportunities to spend wages, tastes for consumer goods, value of leisure, etc. We may represent this tradeoff by a family of isoquant curves, each one associated
with a different level of labour-effort. Corresponding to this culturally determined set of isoquants is a cost constraint or isocost curve, the slope and intercepts of which are prescribed by legal codes and political and social institutions (Fogel and Engerman, 1974, vol. 2, pp. 155-156). Whether a particular society is characterized by "high force" or "low force" systems of labour extraction thus depends on a complex interaction of social, political and economic variables which may be represented analytically by shifting isocost and isoquant curves. Although we will not adopt this technique in its entirety, our model of the modern South African political system will implicitly incorporate the relative prices of alternative degrees of social coercion.

We noted in chapter 2 (section 2.2.4) that a major problem in non-contractarian (or predatory) theories of the state is that presented by the public good aspect of the benefits obtained from group action (North, 1981, pp. 21-22; Olson, 1965, pp. 105-106). Nevertheless, we may derive some insights from the competitive models of social decision making reviewed in chapter 2 (section 2.2.3) which enable us to circumvent the free-rider problem associated with collective behaviour. Specifically, we will follow the example set by the modern theorists of public choice in postulating that the desires of individual political agents are translated into political action through the medium of parties, interest groups, politicians or bureaucrats whose
own utility functions are specified in such a way as to depend directly upon the welfare of their constituents. An interesting application of this method is the model of an endogenous government sector developed by Frey and Schneider (1979). The governing party is assumed to maximize a utility function which depends positively upon the ability of the party to implement its ideological views, which in turn requires that the party behave in such a way as to ensure its own reelection (Frey and Schneider, 1979, p. 30). Even if individual citizens themselves do not have the incentive to engage in political influence-producing activities in order to alter the amounts of certain public policies supplied by the state, their interests will be taken into account by utility maximizing state or government functionaries. This will be true whether the interests of citizens are perceived in the form of immediate opposition or only as potential competition. The "external costs" (in Buchanan and Tullock's sense of the term) imposed on individual citizens by their political environment can lead to what Breton refers to as a "desire for redress":

This "desire for redress" or demand for social and political change will give rise to possibilities of monetary and non-monetary profits and the chances of political support which ad hoc political and social entrepreneurs as well as the elected representatives and contending political parties will want to reap (Breton, 1974, p. 86).

It is in response to the desires of groups of citizens to reduce the "external costs" borne by them that political parties, splinter groups and even ideologies may derive their raison
d'etre (see chapter 2, section 2.2.3). This type of approach reconciles the cost and benefit calculations of private individuals with the realization of political change brought about by non-ruling groups. In an application of this method, Tullock has developed a theory of revolution in which the revolutionaries are motivated exclusively by private gain and any public goods that are produced are assumed to be mere by-products of this private activity. In deciding whether or not to become involved in political opposition, the individual simply compares the net payoff to joining the insurgents with the net payoff to cooperating with the current government. Most potential participants will ignore the public good component of a revolutionary outcome. It is assumed that the magnitude of the private rewards and penalties associated with political activity is sufficiently large to outweigh the incentive to free-ride (Tullock, 1971, p. 92; Wilson, 1973, p. 79; Mueller, 1979, p. 146).

North has demonstrated that the predatory state embodies a fundamental contradiction between maximum societal output and maximum rulers' revenue (1981, p. 10). A particular assignment of property rights which is efficient in economic terms may be "politically inefficient" (Dean, 1982) in the sense that the level of transactions costs associated with enforcing and monitoring that set of property rights may not be conducive to maximizing the rents accruing to the ruling group. As we have
seen in chapter 3, this contradiction is clearly illustrated in Porter's model of the "South African type" economy (1978). Although Lundahl (1982) claims to historicize Porter's model, his analysis of apartheid is not truly "historical" in the sense of providing an endogenous explanation of the evolution and structure of the property rights system that comprises the apartheid polity. Like Porter, he is prevented by the limited confines of his model from accounting for the remarkable flexibility and adaptability of apartheid institutions in response to shifting constraints. A truly "institutional" explanation of apartheid within the neoclassical paradigm necessitates the inclusion of an economic model of political behaviour which in turn is consistent with a theory of historical change. As pointed out in chapter 2, such an explicitly economic approach to politics requires that the governmental process be viewed as an institutional setting within which persons and groups interact to pursue their own ends, regardless of the roles or positions individuals may take, either as decision makers or as those forced to adjust behaviour to the decisions of others (Brennan and Buchanan, 1980, pp. 13-14).
(4.2) The Model

It will be assumed for the sake of simplicity of exposition that the South African polity consists of three identifiable groups - namely, capitalists (who are all white), white workers (who are all skilled), and black workers, who are themselves divided into skilled and unskilled categories. Following Lundahl (1982), we motivate our assumption that all white workers are skilled by the fact that the "poor white" problem had been effectively eliminated by the end of the Second World War, so that a skilled white work force is a reasonably accurate reflection of the post War situation which the present model is intended to describe.7 Black and white skilled workers are close, but not perfect, substitutes. This means that employers can distinguish between the two categories of skilled labour despite a uniform skilled wage rate applicable to both. Again, following Lundahl and Porter (1978), it will be assumed that the South African economy is fundamentally a market economy, with the various dictates of the apartheid state representing constraints upon the operation of the market.

Black unskilled workers may be employed in the reserves (or "homelands") or in the (white) industrial sector.8 Skilled

7Steenkamp points out that the gold boom of the late 1930s and the industrial development after the Second World War practically eliminated cyclical and structural unemployment among whites and produced instead a widespread shortage of skills (1983, pp. 59, 73).

8Throughout the discussion that follows, the term "industrial sector" will be used to describe the entire "modern" or "capitalistic" economy, and will thus include the service, trade and mining sectors as well as manufacturing and heavy industry.
workers (both black and white) may only be employed in the industrial sector. For the purposes of the present model, we will not distinguish between white commercial agriculture and white-owned industry. While it is true that the former employs largely unskilled black labour and the latter employs both skilled and unskilled labour, we can attain a higher degree of generality by combining the two into a single (white) "capitalistic" sector which employs black skilled and unskilled workers.

In order to simplify the analysis, it will be proposed that the industrial sector produces two goods: a non-traded good which is consumed domestically by blacks and whites, and a single export good (represented by gold, which is South Africa's chief source of foreign exchange).\(^9\) The institution of apartheid enters the model in the form of a state determined quantity constraint on the number of black skilled workers employed in the industrial sector, and a restriction on the flow of black unskilled workers permitted to move from the reserves into the industrial sector. The latter is not a direct quantity constraint on the number of unskilled workers, but is modeled

\[^9\]"Capitalists", or employers, do not comprise a distinct consumer group. We may justify this assumption by regarding the model as a version of Debreu's "private ownership economy", in which each i'th producer receives the value of his resources, \(W_i\), plus shares of the profits of each of the other producers, \(Q_{ij}\). Thus the wealth of the consumer-producer is:

\[Z_i = P_i W_i + \sum_{j=1}^{n} Q_{ij} R_j(P) ,\]

where \(R_j\) is the profit earned by the \(j\)'th producer (Debreu, 1959, pp. 78-80).
instead as a transactions cost in the form of a premium on the unskilled wage rate which must be paid by employers. This assumption reflects the fact that the mobility of unskilled workers is limited by a large number of bureaucratic regulations - including influx control, urban residential zoning restrictions, and industrial location policy - so that the cost of hiring unskilled labourers is effectively increased. The restriction on the number of black skilled workers employed in the industrial sector is a direct quantity constraint, however, since it is determined by such factors as access to education and training facilities by blacks, as well as various types of labour legislation which affect the recognition of black trade unions and the job classifications of black workers. (See appendix 2 for a description of the instruments of apartheid policy.) In this respect we are again following the example set by Lundahl (1982), who likewise identifies constraints on the employment of black skilled and unskilled labour as the sole instruments of apartheid in his third stage of development (the post war period), by which time the allocation of land between blacks and whites has been determined so that land alienation no longer constitutes a relevant tool of economic policy.

Once the state has established the desired degree of geographical and skill mobility of black workers, the goods and labour markets determine endogenously the skilled wage rate, the employment levels of black unskilled and white skilled labour, the output levels of both the traded and non-traded goods, and
the price of the latter. The unskilled black wage rate is determined exogenously by the supply price of black labour in the reserves, and the world gold price is also exogenous. It should be noted that we are abstracting altogether from capital as an input into the production function of the industrial sector. This is done in the interests of clarity of exposition and is motivated by the fact that its incorporation will not significantly alter the results which are of most concern.

The analysis thus far appears to consist of little more than a simplification of economic relationships designed to characterize the allocative and distributive effects of apartheid. The purpose of the present model, however, is to provide a basic framework for explaining the historical evolution of apartheid institutions over time. In order to do this, it must include a theory (however simple) of political choice or collective decision making and at least the rudiments of an economic theory of institutions. Accordingly, we incorporate a model of the predatory state in which politicians, political parties, interest groups and bureaucrats are assumed to maximize their probability of survival or reelection, which in turn involves maximizing a utility function that depends upon the utility of each group of constituents (in this case, white skilled workers and white capitalists who are the only two groups to comprise the electorate) weighted by their respective political influence coefficients (which are equal to each group's share of the total electoral population). Blacks enter
the model by virtue of the fact that the costs to the state of maintaining and defending the apartheid system are inversely related to black utility. This formulation is consistent with much of the public choice literature reviewed in chapter 2 (section 2.2.3), in which collective decisions are treated as the outcome of competitive interaction between self-interested political agents (Breton, 1978; Peacock, 1979, pp. 72-73). Following Downs (1957) and Tullock (1967b), it is assumed that the voting franchise within the white group is general and entry into constitutionally sanctioned political activity is unrestricted. It then follows from Black's theorem (given the necessary assumptions regarding the nature of individual utility functions) that competition between political entrepreneurs leads to the election of a government that chooses a platform identical to the optimal position of the median voter (Borcherding and Deacon, 1972, p. 891; Mueller, 1979, pp. 40-41). According to Freeman, it is plausible to assume that such a government will not directly seek to articulate the interests of a disenfranchised group, but will attempt to maximize the income of the voting population, or some function of its income (1974, p. 38). This approach is also consistent with North's conception of the predatory state, where the purpose of government and other state institutions is to effect a redistribution of wealth from the politically powerless to those who have been able to harness the state's comparative advantage in the exercise of force in order to extract rents for
themselves (see chapter 2, section 2.2.4).

The final essential ingredient contained in the model is a simple theory of institutional change. The Coasian analysis of property rights and transactions costs, when applied to explanation of processes of change in economic history, suggests that choices about institutions can be endogenized in much the same way as other types of economic choices. Any particular set of constitutional rules or any particular assignment of property rights is itself the outcome of a utility maximizing individual choice. Different transactions costs are associated with alternative systems of property rights or institutional arrangements, and the choice-theoretic approach of Coasian microeconomics suggests that the system which ultimately prevails will be that which minimizes the relevant set of transactions costs, and furthermore that shifting transactions costs will produce incentives to alter institutions.

The costs of apartheid include both the direct costs involved in administering and policing the system as well as a loss in efficiency which results from the misallocation of resources. As an example of the latter, Griffiths and Jones (1980) identify the various labour market distortions consequent upon statutory job reservation and influx control, which have the effect of limiting productivity, stimulating inflation and diminishing the rate of growth. Employers are denied the right to hire any qualified worker, which causes inflation of labour costs and prices, and a loss of foreign competitiveness "through
the necessity of paying 'monopoly premiums' to existing labour complements" (Griffiths and Jones, 1980, p. 171). In addition, the quality of work may be adversely affected due to the complacency of workers who are protected from competition from other race groups. Thus the existence of job reservation practices serves to reduce productivity and inhibit growth. It may also cause unemployment since the growth of employment opportunities for unskilled blacks is constrained by the growth of the stock of skilled labour, which is partly politically determined and partly dependent on the rate of expansion of the white labour force. Because the number of blacks entering the labour market grows faster than the number of skilled workers, black unemployment increases absolutely during periods of high economic growth and relatively during periods of low growth (Griffiths and Jones, 1980, p. 278). Attempts have been made to measure the costs attributable to the migrant labour system, which is itself a product of apartheid legislation. These costs include the migrant's travel expenses, periods of unemployment necessitated by periodical return to the reserves, and the relatively unproductive time spent in the subsistence sector (Houghton, 1973, p. 90). The high labour turnover associated

10 In 1955, the Tomlinson Commission for the Socio-Economic Development of the Bantu Areas found that, of a total annual potential of 1.14 million man-years of labour available in the African areas, only 480,000 were economically used, and of this, only 433,000 were in paid employment in the "white" areas. On the assumption that the average black migrant's home is 500 kilometers from his place of work and that the average work stint is 18 months, the transportation requirement would have amounted to 310 million man-kilometers per annum (in addition to the normal daily journey to work) (Houghton, 1973, pp. 90-91).
with the system of influx control tends to restrict the acquisition of skills on the part of black workers. This, together with the discriminatory structure of industrial relations, imposes an inevitable social cost:

In so far as it prevents any man from performing a task for which he is competent, and confines him to one which is less skilled, there is economic waste of scarce resources (Houghton, 1973, p. 153).

The costs of administering apartheid are directly related to the level of black resentment aroused by the system and the consequent extent of black resistance. These costs also include the expenditures required to duplicate numerous facilities for the exclusive use of blacks in order to appease external criticism, and the costs of purchasing support for apartheid from African chiefs and other black leaders. According to Savage (1977), the costs of administering and enforcing the system of influx control and "pass laws" include (i) costs of arrests and summonses for pass violations; (ii) costs of patrolling and policing; (iii) costs of prosecutions; (iv) lost production; (v) imprisonment; (vi) issuing and updating pass documents; (vii) costs of labour bureaux and contracts; and (viii) aid centres and transit camps. These are only the most direct and observable of administrative costs. In addition, account should be taken of the proportion of state spending on national defence, education, foreign affairs and other budgetary

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11In 1962, some $400,000 was allocated under the category of "allowances, presents and rations to chiefs and headmen" (Hutt, 1964, p. 133n).
categories which is attributable to the need to maintain apartheid institutions. A close relationship between South African domestic policy and international relations has developed as a result of the granting of independence to a large number of black African states and the subsequent emergence of a strong anti-colonial and anti-racist lobby in international forums. The mounting pressure of world opinion against apartheid institutions has forced South Africa to devote considerable resources to defending its domestic policies on a wide front:

Thus for a small power its representation abroad became extensive ... Foreign policy became in large part concerned with the attempt to justify Government policy towards the non-white population... (Spence, 1971, p. 507).

The expenses involved in conducting this international defence of apartheid must be counted among the costs of maintaining the system.

Of course, only those costs which are perceived to accrue to the ruling group are relevant for the choice problem faced by that group. We noted in chapter 2 (section 2.2.4) that a "distributional coalition" exercising power through the medium of a predatory state is not constrained by the level of social costs imposed on the economy as a whole, since there is no necessary congruence between economic efficiency and "political efficiency" (Becker, 1983, p. 376; Olson, 1982, p. 44). The inefficient allocation of resources resulting from apartheid does not in itself represent a cost to the ruling group, unless the existence of such inefficiency translates into political
resistance or opposition on the part of non-ruling groups.

An economic theory of history or institutional change requires that the economist identify the constraints and costs facing the relevant decision makers (the "institutional innovators" or "primary action groups", in the terminology of Davis and North (1970)\(^2\)), and then proceed to characterize the emergence and evolution of institutions as the product of rational, utility maximizing choice (see chapter 2, section 2.1). In terms of the present analysis, it is necessary to explicitly identify and define the costs involved in administering, defending and policing the apartheid system, as well as the shift parameters which apply to these cost functions. This type of approach is consistent with Adam's "sociological" theory of institutional change in which "the tenacity of social and political institutions or their resistance to change varies with the degree to which they materially benefit important social groups" (1971, p. 163). The strength of this resistance, according to Adam, is proportional to (i) the number of persons or groups who benefit, (ii) the size and nature of this benefit, and (iii) the social power which these groups wield relative to groups who are not beneficiaries of the particular structural arrangement in question.

Our model consists of three different levels of decision making. First, the problem for capitalists is to maximize

\[^2\text{See chapter 2, section 2.1.}\]
profits by choosing the optimal combination of inputs (white and black skilled labour, and black unskilled labour), given the usual cost constraint as well as the restrictions on labour mobility imposed by the state. Second, white and black workers aim to maximize their utility subject to their disposable income. Third, and most important, the rulers who constitute the government and other state institutions are assumed to maximize their probability of reelection or survival in power, which in turn is a function of the utilities of white capitalists and workers weighted by the extent of their political influence, subject to the constraint imposed by the various transactions costs involved in maintaining the institutional structure (which are themselves a function of black utility) relative to the revenue generating capacity of the state. The policy instruments available to the rulers include the tax rates levied on both blacks and whites, and the "level" or "degree" of apartheid as measured by the number (or rate of increase) of blacks permitted to hold skilled industrial jobs and the transactions cost premium levied on employers of unskilled labour. It is assumed by definition of apartheid that the smaller the number of black skilled workers who are employed in the "white" economy, and the larger the transactions cost

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13Here we are following the example of Frey and Schneider (1979). Their model endogenizes the government's choice of the values of certain policy instruments by assuming that the governing party maximizes its probability of reelection subject to a constraint imposed by the requirement that public expenditure may not exceed tax revenue.
"wedge" in the unskilled labour market, the greater the extent to which apartheid institutions are enforced by the state. We pointed out in chapter 3 (section 3.4) that the application of apartheid policy has followed an extremely flexible pattern. This flexibility is important, since it has long comprised an object of contention among whites, and it is therefore appropriate to treat the degree of flexibility as itself a policy variable, the determination of which is a prime function of the political process (Bromberger, 1974, p. 78). The purpose of our model is therefore to demonstrate how the optimal level of apartheid depends upon such parameters as the costs of the system, the structure of the white electorate, and other exogenous variables.

The state is assumed to set a binding ceiling restriction on the level of employment of black skilled workers in the industrial sector, denoted by $L_{bo}$, and to raise the average cost to employers of hiring unskilled labour by a factor of $T_a$. These two policy parameters together characterize the existence of an apartheid institutional system. The industrial sector produces a single non-traded good, $X$, and a single traded good, $G$, whose production functions are of the form:

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1*Some clarification regarding the notation to be used in the model is necessary at this point. A number placed after a variable refers to a partial derivative (e.g. $X_1$ is the first derivative of $X$ with respect to the first argument in the production function, and $X_{11}$ is the second derivative of $X$ with respect to the same variable). Maximum values are represented by a bar (-), a prime ('), or a star (*) superscript.

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where Lux, Lbx and Lwx are the numbers of unskilled, black skilled and white skilled workers employed in the X-producing sector, and Lug, Lbg and Lwg are defined analogously for the G-producing sector. The unskilled wage rate, Wu, is exogenously determined by the average product of labour in the reserves, and the price of gold, Pg, is also exogenous.

Producers ("capitalists") maximize the following profit function:

\[
\text{Max } Q = (1 - Tc) \cdot \{P_X \cdot X(\text{Lux}, \text{Lbx}, \text{Lwx}) \\
+ \text{Pg} \cdot G(\text{Lug}, \text{Lbg}, \text{Lwg})\}
\]
\[
- (1 + \text{Ta}) \cdot \text{Wu} \cdot \text{Lu} - \text{Ws} \cdot (\text{Lb} + \text{Lw})
\]

where

\[
\text{Lu} = \text{Lux} + \text{Lug}
\]
\[
\text{Lb} = \text{Lbx} + \text{Lbg}
\]
\[
\text{Lw} = \text{Lwx} + \text{Lwg}
\]

Tc is the tax rate applied to capitalists' revenues\(^{15}\), Ws is the

\(^{15}\)The distinction between "capitalists" and "workers" has no real content in a pure general equilibrium setting, since all factors earn a normal rate of return. However, we can distinguish capitalists from workers by assuming that the former possess some specialized skills in organizing and monitoring production.
skilled wage rate, \( P_x \) is the price of the non-traded good, \( P_g \) is the gold price and \( T_a \) is the transactions cost incurred by employers of unskilled labour. The first-order conditions define a maximum profit function, the optimal quantities of \( X \) and \( G \) produced, and the amounts of skilled and unskilled labour demanded in the two industries (\( L_{ud}, L_{bi} \) and \( L_{wd} \)) as functions of prices, wage rates, \( T_c \) and \( T_a \). The partial derivatives of these maximum value functions can then be calculated by applying a lemma of the envelope theorem (Varian, 1978, p. 268). The details of the calculations are presented in appendix 3.

Workers choose to consume \( X \) and supply labour in such a way as to maximize their individual utility functions subject to disposable income constraints. For white skilled workers, the problem may be expressed as follows:

\[
\text{(4) } \quad \max_{X_w, L_w} U_w(X_w, L_w), \quad U_{w1} > 0, \quad U_{w2} < 0
\]

subject to \( P_x X_w = (1 - T_w) W_s L_w \)

where \( X_w \) is the quantity of \( X \) consumed by white workers, \( L_w \) is the quantity of white skilled labour supplied and \( T_w \) is the tax on white earnings. Black workers face a more limited range of choice, since their employment levels are assumed to be constrained by apartheid restrictions. Thus black skilled workers behave as follows:
(5) \[ \text{Max } U_b = U_b(X_b, L_b), \quad U_b1 > 0, U_b2 < 0 \]

subject to \[ P_x X_b = (1 - T_b) W_b L_b \]

where \( X_b \) is the quantity of \( X \) consumed by black skilled workers and \( T_b \) is the tax rate levied on black earnings. Similarly, in the case of black unskilled workers:

(6) \[ \text{Max } U_u = U_u(X_u), \quad U_u1 > 0 \]

subject to \[ P_x X_u = (1 - T_b) W_u L_u (P_x, P_g, W_u, W_s, T_a, T_c) \]

where \( X_u \) is the quantity of \( X \) consumed by black unskilled workers. The supply of unskilled labour is perfectly elastic at the exogenous unskilled wage rate, \( W_u \), so that the number of unskilled workers employed at any given wage rate is determined by the labour demand schedule, \( L_u(.) \). Again, the first-order conditions define maximum value functions for \( X_w, X_b, X_u \) and \( L_w \), whose partial derivatives may be evaluated using the envelope theorem.

Equilibrium in the goods market is defined by:
(7) \[ \bar{X}(P_x, P_g, W_u, W_s, T_a, T_c) = \bar{X}w(P_x, W_s, T_w) \]
\[ + \bar{X}b(P_x, W_s, L_b, T_h) + \bar{X}u(P_x, P_g, W_u, W_s, T_a, T_c, T_h) \]

where the "bar" (-) indicates a maximum value function.

Equilibrium in the skilled labour market is likewise defined by:

(8) \[ \bar{L}w(P_x, P_g, W_u, W_s, T_a, T_c) + \bar{L}b(P_x, P_g, W_u, W_s, T_a, T_c) \]
\[ = \bar{L}w(P_x, W_s, T_w) + L_b \]

Invoking these market clearing conditions, we can obtain reduced form expressions for \( X, G, P_x \) and \( W_s \) which can then be substituted into the maximum value profit, output, white labour supply and white and black utility functions.

Turning now to the political sector of the model, the ruling group is assumed to maximize a utility function of the form:

(9) \[ U_r = U_r(z), \quad U_r1 > 0 \]

where \( z \) is the probability of reelection or survival in office, and is defined as a population share weighted sum of the utilities of the component groups of the (white) electorate. It
will be assumed that producers' utility is a monotonically increasing function of profits, so that we may substitute the profit function, $Q(\cdot)$, for a white capitalist utility function. We can then simplify further by treating $Ur$ as itself a weighted sum of white workers' utility and producers' profits.\(^{16}\) The choice problem facing the ruling group may be represented as follows:

\[
\begin{align*}
\text{Max } Ur &= a \cdot Uw(\cdot) + (1 - a) \cdot Q(\cdot) \\
\text{(Lbo, Ta, Tc, Tw, Tb)} &
\text{(subject to } Tc \cdot Px(\cdot) \cdot X(\cdot) + Tc \cdot Pq \cdot G(\cdot) + Tw \cdot Lw(\cdot) \cdot Ws(\cdot) \\
&
\text{+ Tb \cdot Lu(\cdot) \cdot Wu + Tb \cdot Lbc \cdot Ws(\cdot)} \\
&
\text{= } C(\text{Ub}(\cdot), \text{Uu}(\cdot), D), \\
C1 < 0, C2 < 0, C3 > 0, C13 < 0, C23 < 0
\end{align*}
\]

where $a$ is the proportion of the white population which consists of skilled workers, $C$ is the "apartheid cost function", and $D$ is a shift parameter which depends on such factors as external support or opposition, military technology, organizational

\(^{16}\)In long-run equilibrium all profits are reduced to zero. We may, however, postulate the existence of some fixed factor owned by white employers. The rents accruing to this factor will be diminished if capitalists are constrained in their ability to hire other factors in the desired proportions.
cohesion of internal resistance groups and internal opposition, etc. In effect, the rulers choose optimal levels of the apartheid policy parameters, Lbo and Ta, as well as the tax rates, Tc, Tw and Tb, subject to the constraint that the total tax revenue of the state equals the cost of administering, maintaining and defending the apartheid system, which itself is inversely related to black utility. The first-order conditions for a maximum define the following reduced form expressions for the five policy instruments:

\[\text{expressions}\]

---

17 Pressure upon the South African government which originates outside the country may be conceptually divided into three categories: (i) events in Africa (e.g., transition to black rule in neighbouring countries such as Angola, Mozambique and Zimbabwe, and the changing attitudes of the so-called "front-line states" and the O.A.U.); (ii) international political developments, of which the most important include the policies of major Western industrialized countries. "If Southern Africa is to be defended for the West – and powerful economic interest as well as strategic considerations seem to suggest this intention without doubt – the country has to be made defensible by removing the most objectionable aspects of the present system" (Thomas, 1977, p. 4); (iii) factors related to the world economy, such as the availability of foreign capital and access to markets for South Africa’s industrial exports. Sources of internal political pressure include the activities of blacks, both within the urban areas and the governments of "independent" homelands, the reactions of white opposition groups and the general economic situation, especially rising defence expenditures, increased taxes and unemployment (Thomas, 1977, pp. 8-10).
Because of the general equilibrium structure of the model, it is not possible to derive unambiguous or determinate comparative static results without imposing a number of restrictions on the signs and relative magnitudes of various elasticities and partial effects. The important point for our present purpose is to show that it is possible to choose a particular set of mutually consistent assumptions in order to yield comparative static predictions which are intuitively plausible in the light of these restrictions.

The need for these restrictions arises out of the fact that no explicit assumptions were made at the outset, regarding the relative factor intensities of the gold and consumption goods industries. In a general equilibrium model with two goods and three factors (in which none of the factors is employed uniquely in a particular sector), the effects of changes in goods prices or factor endowments upon output and factor returns depend crucially upon the ranking of factor intensities in the two sectors of production as well as upon the degree of substitutability or complementarity between factors. Thus Jones and Easton (1983) show that, in such a general model where no factor is sector-specific, comparative static results depend upon which factor is chosen as the "middle factor" in terms of intensity in the two sectors and upon whether the "extreme factors" are assumed to be better substitutes for each other than for the middle factor (1983, pp. 68, 84). Unlike "even" models of general equilibrium with equal numbers of factors and commodities, factor prices in the general 2x3 model are determined not only by commodity prices but also by factor intensities and substitutability.
of the underlying economic theory. The specific restrictions which we have imposed are spelled out in appendix 3, where full calculations of the results are also provided. Even after establishing these restrictions, it remains difficult to evaluate the effects of changes in the gold price and the unskilled wage rate on the optimal tax rates levied on employers and on white workers, because of the interdependencies which are inevitable in a general equilibrium model. Nevertheless we are able to assert, with appropriate assumptions, the following comparative static implications of the model:

(1) \( Lbo1' < 0 \); (2) \( Lbo2' > 0 \); (3) \( Lbo3' > 0 \); (4) \( Lbo4' > 0 \);
(5) \( Ta1' > 0 \); (6) \( Ta2' < 0 \); (7) \( Ta3' < 0 \); (8) \( Ta4' < 0 \);
(9) \( Tc1' > 0 \); (10) \( Tc4' < 0 \); (11) \( Tw1' < 0 \); (12) \( Tw4' > 0 \);
(13) \( Tb1' > 0 \); (14) \( Tb2' > 0 \); (15) \( Tb3' > 0 \); (16) \( Tb4' < 0 \)

A discussion of these results follows in the next section.

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The restrictions are essentially of three types: (i) technical conditions regarding the relative slopes of goods and factor demand and supply functions; (ii) those specifying the relative magnitudes of effects on prices and wages of changes in exogenous and policy variables; (iii) those specifying the relative magnitudes of the marginal utility or disutility attached by various groups to changes in policy variables.
14.3 Implications and Predictions of the Model

Perhaps the most striking conclusion to be drawn from the above analysis is the complexity of the relationships between the various groups of beneficiaries and subordinates. The general equilibrium nature of the model ensures that it is not always possible to produce a clear delineation between group interests. In this respect, the model departs most noticeably from those of Porter (1978) and Lundahl (1982). The latter purport to illustrate the determinate effects of apartheid restrictions upon an ad hoc and complex set of objectives which are attributed to the white ruling group. The present model, by contrast, starts out with the simplest possible postulate of individual utility maximization and proceeds to show that the effects of apartheid policies on the endogenous variables are by no means unambiguous. Nevertheless, by appending a model of political decision making and by specifying appropriate assumptions, it is possible to indicate how the optimal "level" or extent of enforcement of apartheid institutions is chosen, and how changes in certain variables are likely to affect this choice. The model is therefore able to provide a "rationale" for apartheid which lies within the boundaries of economic method.

More specifically, the analysis in the previous section shows that an increase in the costs of defending, administering and otherwise maintaining the apartheid system will result, ceteris paribus, in a reduction in the "level" of apartheid (i.e., a reduction in the extent to which apartheid policies are
applied and enforced, which is represented in the model by an increase in the number (or growth rate) of black skilled participants in the labour market and a decrease in the transactions cost premium on the unskilled wage rate) (results 4 and 8). Results 1, 5, 9 and 13 imply that an increase in the degree to which white workers benefit from apartheid, measured in terms of an increase in the proportion of white workers in the total voting population (a), translates into an increase in the "demand" for apartheid. This in turn will result in a larger amount of apartheid being "purchased", in the sense that there will be a reduction in the rate of absorption of blacks into the modern sector economy and taxes on employers and blacks will be raised in order to finance the higher level of enforcement of apartheid institutions, which now have a higher marginal utility to white decision makers. Results 2 and 6 mean that an increase in the world gold price will cause a reduction in the optimal level of apartheid, which in turn derives partially from the positive output effects of such an increase and the consequent decline in the perceived need by white workers to artificially restrict black competition.

For similar reasons, a rise in the exogenous unskilled wage rate will reduce the benefit derived from the maintenance of a given level of apartheid (results 3 and 7). A higher unskilled wage implies that it is no longer necessary to artificially restrict the inflow of black unskilled workers to the same extent because unskilled labour is rendered less competitive by
virtue of the increased wage. The "demand" for apartheid institutions is accordingly reduced. The positive output effects of a rise in the gold price also enable blacks to be taxed at a higher rate without raising the level of resistance by an amount that would impose unacceptably high costs on the maintenance of the system (result 14). Results 10 and 16 imply that an upward shift in the costs of policing and administering apartheid institutions (due to a change in the parameters of the "apartheid cost function") will reduce the optimal tax rate levied on blacks and on white employers, because such taxes enter negatively into black utility functions and therefore lead to resistance by blacks to apartheid policies. Result 15 means that an exogenous increase in black unskilled wages makes it less costly to tax black workers, so that the optimal black tax rate increases. Finally, result 11 shows that a rise in the proportion of white workers in the total white population causes a fall in the optimal tax rate on white wage income, while result 12 shows that this tax rate will increase if the apartheid cost function shifts upwards.

Most of these results are potentially testable. For example, the model leads us to expect a negative relationship between exogenous cost changes and the "level" of apartheid. The latter may be measured either directly by the sizes (or rates of growth) of the urban black skilled and unskilled labour forces, or indirectly by the expenditure of government departments entrusted with the task of administering apartheid policy (e.g.
Bantu Administration, black education and housing, etc.). A shift in the "apartheid cost function" may be proxied by changes in expenditures on national defence, foreign affairs and propaganda efforts, as well as other expenditure categories which are responses to perceived threats to the system. In addition, we will test the predictions of the model regarding the effect of demographic changes (e.g. in the proportion of white workers in the electorate) and alterations in the level of white net immigration on the optimal extent of apartheid policy. We may broaden the definition of "capitalist" to include those white workers possessing large endowments of human capital (e.g. professional and technical workers), and the model will then imply that a shift in the occupational structure of the white population towards these job categories will cause a decline in the application and enforcement of apartheid institutions. In the same light, we may examine the future ramifications of the newly adopted constitution, under which limited numbers of blacks (namely, "Coloureds" and Indians) will be included in the electorate. In terms of our model, this would alter the structure of the ruling group's utility function by increasing the proportion of the voting population who are materially disadvantaged by the system, and we may thus expect a decline in the optimal extent of apartheid.

The theory outlined in this chapter therefore facilitates not only an explanation of the flexibility and adaptability of apartheid institutions which is consistent with individual
rationality, but it also enables us to identify some of the variables which are relevant in determining the ability of these institutions to survive as a viable political system. In the following chapter we will demonstrate how a number of the model's implications may be subjected to empirical testing.
V. AN APPROACH TO EMPIRICAL TESTING OF THE ECONOMIC MODEL OF APARTHEID

(5.1) Introduction

In this chapter an attempt will be made to submit some of the theoretical relationships identified in chapter 4 to empirical testing. It should be stressed at the outset that the quantitative analysis undertaken here is entirely exploratory, and its purpose is primarily to suggest ways in which the theory may be confronted with the real world rather than to present any definitive results. The limited scope of the empirical estimation described in this chapter is not, however, a matter of deliberate choice on the part of the author, but is largely dictated by the inadequacy of the available data and by the difficulties inherent in model specification. The latter, in turn, derive from the problems involved in measuring an elusive and multidimensional phenomenon such as apartheid.

In the next section, certain pertinent methodological aspects of econometric practice will be discussed. We then proceed to outline the method adopted in this study, and to present some of the results. The concluding section indicates avenues for further research along similar lines.
It has long been recognized by economic historians concerned with the application of quantitative techniques, that mis-specification of models and problems of underidentified equations represent the most severe obstacles to meaningful empirical testing of their theories (Fogel, 1967, p. 295; Wright, 1971, pp. 422-423). The same may be said for economic models of political and social behaviour in general, in which clearly identified structural relationships are not as well established as in more traditional branches of economic theory. Thus Desai points out that, in such models, there is a strong likelihood that variables will be missing from equations and that the resultant underidentification will preclude the economist from making any causal inferences. Instead, he will be able to offer little more than statements about "tendencies towards correlation" among the variables he is studying (Desai, 1968, pp. 2-6).

The econometric caveats involved in specification search and diagnostic testing are well known and we need only allude to them here. Hendry has shown that deception is easily practised by econometricians who have found their "Philosophers' Stone" in regression analysis and use it for transforming data into supposedly "significant" results (1980, p. 389). In Hendry's words:

Simply writing down an "economic theory", manipulating it to a "condensed form" ... and "calibrating" the resulting parameters using a pseudo-sophisticated estimator based on poor data which the model does not
In order to avoid such alchemical perversions of econometric techniques and to ensure the status of econometrics as science, Hendry and his collaborators suggest that the researcher concentrate on demonstrating precisely why different models produce different results. In stressing the implications for each model of the results obtained by others, a major role is assigned to mis-specification analysis. Even with the use of a data-based "general" model, it is non-trivial to explain why different researchers arrive at different conclusions:

That the general model is not obtained by every investigator seems to depend on the operation of (self-imposed) constraints limiting the range of specifications, estimators, diagnostic tests, etc., which are employed. Such arbitrary and unnecessary constraints can play a large role in determining the final equations selected ... (Davidson, et. al., 1978, pp. 662-663).

Estimated regression coefficients are often more the product of the a priori beliefs of the investigator than of actual sample information. This is reflected not only in the equation specifications selected by the individual researcher, but, more insidiously, in the (usually) unreported pretesting or "data mining" practices which precede the publication of results. Failure to take account of pretest bias implies that intermediate findings and alternative specifications are not reported, so that "negative results" are under-represented and potentially useful information is concealed (Feige, 1975, p. 1293; Heijdra, 1984, p. 46). The regressions which are reported are usually the outcome of a prolonged specification search, and
therefore do not represent statistical tests unambiguously implied by the theory (Cooley and LeRoy, 1981, p. 826). In fact, specification search renders invalid the application of standard tests. In order to mitigate this problem, Cooley and LeRoy (following Leamer) suggest that uncertainty about equation specification should be addressed directly by dividing potential regressors into two classes - namely, "focus variables" and "doubtful variables" (1981, p. 827). The researcher would then proceed to ascertain the sensitivity of the estimated focus coefficients to the inclusion or non-inclusion of various "doubtful" regressors. This approach would be particularly informative in cases where problems of simultaneity and identification of a structural model prevail, and where the subjective judgement of the researcher is necessary to determine the types of restrictions which should appropriately be placed upon the specification.

Unfortunately the empirical work undertaken in this chapter does not have the advantage of proceeding on the basis of a correctly identified structural model. Instead it bears much in common with a large body of cliometric literature which, according to Wright, is characterized by the "casual" use of regression analysis (1971, p. 422). The term casual is not intended by Wright to carry pejorative connotations. Rather, it refers to the application of regression analysis simply to verify certain correlations which may be present in a set of data, but without the utilization of a large well-specified
system of equations (Wright, 1971, p. 423; Fogel, 1967, p. 298). Mayer points out that the results of most applied econometric work should not be regarded as evidence from a "crucial experiment", but should instead be treated as mere "circumstantial evidence" in favour of or against the hypothesis in question (1980, p. 173). This view is consistent with Friedman's belief that repeated successful application of a theory becomes indirect testimony in its favour (Heijdra, 1984, p. 47n).

The model developed in the preceding chapter suggests that certain types of independent variables may be important determinants of the extent or level of application of apartheid institutions. The regression results presented in this chapter cannot identify relationships of causality among these variables, but can serve only to confirm the existence of what Desai refers to as "tendencies towards correlation". Problems of multicollinearity, the limited range of data observations, and the lack of a priori knowledge about appropriate lag structures, mean that most of the estimated equations are likely to be mis-specified, and the reliability of the coefficient estimates and t-statistics should be discounted accordingly (Kennedy, 1979, pp. 57-59, 128). It is worth repeating at this point that the purpose of the exercise is not to arrive at definitive results which purport to "confirm" the predictions of the model. We are also not able to confront the theory with an alternative explanation in order to test their relative predictive power,
since there does not exist an established orthodoxy capable of yielding empirically testable hypotheses against which a new theory may be compared. Instead, our use of regression analysis is "casual", in Wright's sense of the word, and we claim to offer little more than some initial and somewhat tentative "circumstantial evidence". The most important contribution of this chapter is not to provide actual quantitative findings, but to illustrate how apartheid institutions and their determinants may be "measured" in an operational manner.

(5.3) Regression Results

According to the model proposed in chapter 4, apartheid may be represented by a quantity constraint upon the supply of skilled or educated black workers, and by a premium placed on the price of unskilled labour. Both of these manifestations of the apartheid system are assumed to reduce the extent of black (skilled and unskilled) labour force participation in the industrial economy below that which would prevail in an unconstrained situation. In addition to the instruments of apartheid itself, the ruling group also determines the tax rates applied to black and white workers and (white) employers or "capitalists". All of these endogenous variables are functions of four primary exogenous variables - namely, the proportion of the white electorate which consists of skilled workers as opposed to capitalists, the gold price, the unskilled wage rate, and the costs of defending and administering the apartheid
system (see chapter 4, equations 11-15). By placing appropriate restrictions upon the general equilibrium structure of the model, we obtain qualitative predictions regarding the signs of the partial derivatives of these reduced form functions.

The extent to which we are able to give quantitative substance to these predictions is, of course, conditioned by the data which are available. It was not possible, unfortunately, to obtain separate time series data for tax rates levied on black and white workers, and only corporate taxes and taxes on the mining sector are used in estimation. Explicit data for government expenditure on administering apartheid laws and regulations were also not available, so that various proxies are used to represent the level of resources absorbed in sustaining the apartheid structure. Many of the more interesting and useful time series do not extend over a sufficiently long period, with the result that most of the regression equations are estimated over relatively short ranges and are characterized by limited degrees of freedom. In addition, the data are highly collinear, which produces imprecise and unstable coefficient estimates, high values of the coefficient of determination and low t-ratios (Intriligator, 1978, p. 153). These problems render difficult the process of specification search, since the removal or addition of a single explanatory variable or data point causes dramatic changes in coefficient estimates and tests of significance. Incorrect specification may therefore be inevitable, and in those cases where relevant variables are
omitted, the estimates will be biased and inconsistent. If a larger number of regressors is used, however, the problems of multicollinearity and inadequate degrees of freedom are further exacerbated (Intriligator, 1978, p. 189). It is assumed a priori that the behaviour of politicians and bureaucrats does not adjust instantaneously to changes in constraints, and most of the independent variables are accordingly lagged by one or two years. Lagged dependent variables are sometimes included on the same grounds. However, the theory provides us with no information as to the precise lag structure which is appropriate, so that the specification of lags within the regression equations is unavoidably ad hoc. According to Mayer, this is one of the few instances in which some limited data mining or pretesting is a necessary evil (1980, p. 174). Our equations are estimated using two different types of functional form - loglinear and first differences of logarithms. Representative examples of both are illustrated in tables 5.1 to 5.4. All data are annual and are defined in appendix 4, where their sources are also documented.

In table 5.1, the extent of apartheid is measured by the accessibility of higher education to nonwhites and the potential supply of educated nonwhite workers. This is intended to capture the quantity-constraint aspects of apartheid restrictions on the skilled nonwhite labour force. The actual educational measures used are: the number of blacks enrolled in secondary schools per one thousand of the population (BSECSCSHS), the number of black
and nonwhite students enrolled in universities per one thousand of their respective populations (BUNIVS and WSSUNIVS), and the ratio of the number of coloureds and Indians enrolled in teachers' training colleges to the total coloured and Indian population (CITEACHS).\(^1\) Regressors include the real gold price (RPGM) and various measures of real unskilled wages (AVRWWW, RWASERV).\(^2\) Changes in the exogenous shift parameters of the apartheid cost function are captured by a number of variables which represent the extent of policing and defence activity. These include real government expenditure on national defence (RDEF), indicators of domestic black and nonwhite strike action or work stoppages as proxies for internal resistance (RWAWKSTP, BSTRIKE), and dummy variables representing the 1973 Durban strikes (DST) and the collapse of the Portuguese empire in 1974 (DPT).\(^3\)

\(^1\) In chapter 4 the analysis was simplified by dividing the South African population into black and white components, where the category "black" was intended to include coloureds and Indians as well as Africans. In this chapter we will follow common usage by reserving the term "black" for persons of primarily African descent. The "nonwhite" group embraces blacks, coloureds and Indians.

\(^2\) AVRWWW is the average annual real wage rate of nonwhites employed in mining, manufacturing, construction, transportation and government, and as such it will include some skilled wages in addition to unskilled. Its use as a proxy for the unskilled wage rate is motivated by the fact that a large majority of blacks employed in these sectors is likely to be unskilled. RWASERV is an index of the average annual real cash wages of full-time domestic servants, and its use as a measure of the unskilled wage rate is less problematic, since domestic service is one of the least skilled employment categories.

\(^3\) It is assumed that the Durban strikes of 1973, and their political aftermath, significantly raised the costs of administering and policing the system of industrial relations.
The model developed in chapter 4 predicts that a rise in the proportion of the white electorate which comprises "capitalists" or employers will result in a diminution of apartheid institutions. As pointed out in chapter 4 (section 4.3), we may define professional and technical workers, and others endowed with large amounts of human capital, as members of the capitalist group. Unfortunately, time series data for the occupational structure of the workforce are not available and proxy variables must be used. These include the number of full-time white university students per one thousand of the white population (WUNIVS) and the net immigration flow (IMMIG-EMIG). This choice is justified on the grounds that university attendance is highly correlated with the acquisition of human capital, and on the assumption that the majority of immigrants and emigrants are whites with professional or technical qualifications. The unemployment rate among whites, coloureds and Indians (UNEMPS) is included as a rough measure of the efficiency cost of apartheid. Changes in the unemployment rate may translate into shifts in the apartheid cost function which is relevant to the ruling group's decision making process if some of the unemployment is perceived by their political opponents as a direct outcome of the misallocation of resources

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3(cont'd) In fact, the increased level of black worker consciousness undoubtedly contributed to the liberalization of industrial relations legislation which occurred in 1979 (see appendix 2). The advent of black majority rule in Mozambique and Angola is assumed to have increased the costs of defence against external attack.
consequent upon apartheid restrictions. Finally, various measures of the level of economic activity or rate of economic growth are incorporated in the equations, such as real nonwage income (RNONWAGE), real gross domestic product and national product (RGDP, RGNP) and per capita income (PCRGDP). A linear time trend (T) is included in equation 1, and a one- or two-year lag is applied to most of the explanatory variables.

Examination of table 5.1 reveals significant positive correlations between the numbers of blacks or nonwhites attaining higher levels of education and such regressors as the unskilled wage rate, nonwhite strike activity and white university enrolment and net immigration.* If these variables are interpreted in the manner described above, the signs of their coefficient estimates are consistent with the predictions of the theory — namely that lower levels of application of apartheid policy (represented here by increases in the numbers of nonwhites permitted to acquire higher education) will result from a higher unskilled wage rate, an increase in the proportion of the white electorate who are non-workers or an increase in the costs of defending apartheid. The predicted relationship between the gold price and the dependent variables is not confirmed, except in equation 4 where the gold price has a positive coefficient. It should be stressed once again, of

*The degree of significance is measured in a one-tailed test at both the 95 and 90 percent confidence levels (see tables 5.1 to 5.4 for the relevant critical values of the t-statistics in each case).
course, that the coefficient estimates and t-statistics are not reliable due to multicollinearity and specification error.

One of the endogenous variables in the model proposed in chapter 4 is the tax rate levied on capitalists or employers (Tc), which should bear a negative relation to the proportion of the white electorate consisting of non-workers and a negative relation to the costs of enforcing and defending apartheid institutions. Adequate time series data for tax rates themselves are not available, but data were obtained for tax revenues collected from mining, manufacturing and commercial enterprises. In table 5.2, the variable INTAXFIR is an average index of total taxes paid by such firms, and RTAXRMI is total revenue from taxes on mining companies. Regressors include various measures of the costs of apartheid, such as the share of gross national product allocated to defence spending (DEFS), the unemployment rate, and the number of banning orders served on individuals (BAN). Other independent variables are the unskilled wage rate (RWAREV), the real gold price (RPGM) and per capita national income (PCRMMI). Table 5.2 indicates a strong positive relationship between the volume of corporate tax revenues and the gold price, and a strong negative relationship between these.

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5 The banning order is an instrument used by the South African government to restrict a person to a prescribed place of residence and prevent him from engaging in work which involves contact with more than a small number of people. The writings and utterances of such an individual cannot be published or quoted. Banning orders are applied and enforced through the judicial system and the number of such orders is used here as a proxy for one category of the costs of maintaining and policing the apartheid system in the face of internal resistance.
Table 5.1: Regression Results - Educational Measures of Apartheid *

(1) \[
\log(\text{BSECCHS}) = -9.82 + 0.69 \log(\text{BSECCHS}) \\
\quad + 0.54 \log(\text{RNONWAGE}) - 0.19 \log(\text{RPGM}) \\
\quad + 2.78 \log(\text{AVRWWW}) + 0.05 \log(\text{RWAWKSTP}) \\
\quad - 0.14 \log(\text{UWMEPS}) - 0.03 \log(\text{RDEF}) \\
\quad + 0.02 \log(\text{DPT}) - 0.07 \log(\text{T}) \\
\text{R} = 1.0 \quad \text{range} = 1967-1977 \quad t(0.05) = 6.314 \quad t(0.10) = 3.078
\]

(2) \[
\log(\text{BUNIVS}) = -31.1 - 0.58 \log(\text{BUNIVS}) \\
\quad + 1.97 \log(\text{RGDP}) - 0.05 \log(\text{RPGM}) \\
\quad - 0.24 \log(\text{UWMEPS}) + 0.11 \log(\text{BSRIKE}) \\
\quad + 0.82 \log(\text{WUNIVS}) + 0.20 \log(\text{IMMIG} - \text{EMIG}) \\
\quad + 0.82 \log(\text{AVRWWW}) - 0.19 \log(\text{DST}) \\
\text{R} = 1.0 \quad \text{range} = 1966-1977 \quad t(0.05) = 2.920 \quad t(0.10) = 1.886
(Table 5.1, Continued)

(3) \[ \log(\text{NWSUNIVS} / \text{NWSUNIVS}) = 0.13 - 0.76 \log(\text{RGNP} / \text{RGNP}) \]
\[ t \quad t-1 \quad (8.38) \quad (-3.37) \quad t \quad t-1 \]
\[ - 0.09 \log(\text{RPGM} / \text{RPGM}) \]
\[ (-1.69) \quad t \quad t-1 \]
\[ - 0.11 \log(\text{RWASERV} / \text{RWASERV}) \]
\[ (-0.27) \quad t \quad t-1 \]
\[ + 0.03 \log(\text{BSTRIKE} / \text{BSTRIKE}) \]
\[ (3.34) \quad t \quad t-1 \]

\[ R = 0.763 \quad \text{range} = 1966-1976 \quad T(0.05) = 1.943 \quad T(0.10) = 1.440 \]

(4) \[ \log(\text{CITEACHS} / \text{CITEACHS}) = -0.04 \]
\[ t \quad t-1 \quad (-0.72) \]
\[ - 1.08 \log(\text{PCRGDP} / \text{PCRGDP}) \]
\[ (-0.88) \quad t \quad t-1 \]
\[ + 3.20 \log(\text{RWASERV} / \text{RWASERV}) \]
\[ (1.92) \quad t \quad t-1 \]
\[ - 0.03 \log(\text{BSTRIKE} / \text{BSTRIKE}) \]
\[ (-0.72) \quad t \quad t-1 \]
\[ + 0.19 \log(\text{RPGM} / \text{RPGM}) + 0.02 \times \text{DST} \]
\[ (1.33) \quad t \quad t-1 \quad (0.29) \]

\[ R = 0.099 \quad \text{range} = 1966-1977 \quad T(0.05) = 1.943 \quad T(0.10) = 1.440 \]
All variables are defined and described in appendix 4. The method of estimation is ordinary least squares and the numbers in parentheses are t-statistics. The corrected coefficient of determination is provided at the end of each equation. The Durbin-Watson statistic is not reported since it is not possible to make any meaningful inferences from this statistic when there are fewer than ten degrees of freedom. T(0.05) is the critical value of the t-statistic at the 95 percent confidence level in a one-tailed test, and T(0.10) is the corresponding critical value at the 90 percent confidence level.

Taxes and the unskilled wage rate. Conclusions with regard to the costs of apartheid are ambiguous. Unfortunately, as mentioned above, the lack of suitable data prevents us from examining the effect of apartheid parameters upon personal taxes on white and nonwhite workers.

The model in chapter 4 implies that apartheid restrictions will have a negative effect upon the size of the nonwhite labour force employed in the industrial sector. In table 5.3, LNW is the total number of nonwhites employed in mining, manufacturing, construction, transportation and central government. PARTNW is the nonwhite participation rate, defined as the ratio of nonwhite employment to total nonwhite population. In equations 9 and 10 of table 5.3, the dependent variables are the ratio of nonwhite industrial employment to white employment in the same sectors, and the ratio of the nonwhite participation rate to the white participation rate (defined analogously). The regressors are the same as those included in tables 5.1 and 5.2, with the

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6This definition of the participation rate is necessitated by the fact that data on black unemployment are not published.
Table 5.2: Regression Results - Corporate Taxes *

(5) \[ \log(\text{INTAXFIR}) = -10.4 + 2.15 \log(\text{PCRWNMI}) \]
\[ t \quad (-2.37) \quad (2.23) \quad t-1 \]
\[ + 0.77 \log(\text{RPGM}) - 0.18 \log(\text{UNEMPS}) \]
\[ (3.04) \quad t-1 \quad (-0.89) \quad t-2 \]
\[ + 0.22 \log(\text{DEFS}) \]
\[ (0.64) \quad t-2 \]
\[ R^2 = 0.971 \quad \text{range} = 1967-1977 \quad T(0.05) = 1.943 \quad T(0.10) = 1.440 \]

(6) \[ \log(\text{RTAXRMI}) = 5.83 - 0.22 \log(\text{RTAXRMI}) \]
\[ t \quad (1.20) \quad (-1.80) \quad t-1 \]
\[ + 4.20 \log(\text{PCRWNMI}) + 1.02 \log(\text{RPGM}) \]
\[ (2.08) \quad t-1 \quad (3.99) \quad t-1 \]
\[ + 0.05 \log(\text{UNEMPS}) - 4.62 \log(\text{RWASERV}) \]
\[ (0.28) \quad t-1 \quad (-2.45) \quad t-2 \]
\[ - 0.18 \log(\text{DEFS}) - 0.03 \log(\text{RAN}) \]
\[ (-0.96) \quad t-2 \quad (-0.20) \quad t-1 \]
\[ R^2 = 0.958 \quad \text{range} = 1963-1977 \quad T(0.05) = 1.895 \quad T(0.10) = 1.415 \]

* See notes to table 5.1.

addition of RGEXHOM (total real expenditure by South African government institutions in the black homelands), WKSTOPS (ratio of the number of nonwhites involved in work stoppages to total nonwhite industrial employment) and DEFS (real per capita defence expenditure). The former two represent measures of the
domestic administration and policing costs of apartheid, while the latter is an indicator of external defence costs. Since the employment of nonwhite labour is likely to depend upon the prices of substitute factors and the price of output, the real white industrial wage rate (AVRWW) is incorporated together with the long-term interest rate (INT) in equation 9 and the consumer price index (CPI) in equation 7. A dummy for the Soweto riots of 1976 (DSO) is included in equations 8 and 10, on the grounds that a sudden exogenous increase in the level of internal black resistance translates into an upward shift in the apartheid cost function. In equations 7 and 9, there is a notable positive correlation between the magnitude of nonwhite employment (or the participation rate) and the number of whites who identify their interests with the capitalist or employer group (represented by WUNIVS or IMMIG-EMIG). The gold price is positively related to nonwhite employment in equation 7, as is the unskilled wage rate (RWASERV) in equation 9. The most striking result to be derived from table 5.3, however, is the consistently significant positive correlation between the various measures of the costs of policing and defending apartheid (RDEF, DEFSP, BSTRIKE and WKSTOPS) and the relative size of the nonwhite labour force. The dummy variable for the Soweto riots (DSO) also bears a positive relationship to the absorption of nonwhite workers in the industrial sectors of the economy.

The level of enforcement of apartheid policy is measured more directly in table 5.4. The variable WADETS (the ratio of
Table 5.3: Regression Results - Labour Force Measures of Apartheid *

(7) \[ \log(LNW) = 13.5 + 0.11 \log(IMMIG - EMIG) + 0.05 \log(RPGM) + 0.14 \log(RWASERV) - 0.23 \log(AVRWW) - 0.34 \log(CPI) + 0.06 \log(RDEF) + 1.09 \log(WUNIVS) + 0.01 \times DST \]
\[t\ (9.71) \ (2.48) \ (1.65) \times t-1 \ (0.74) \times t-1 \ (0.96) \times t-1 \ (-3.33) \times t-1 \ (1.31) \times t-1 \ (3.42) \times t-1 \ (0.51) \times t-1 \]

\[ R^2 = 0.993 \quad \text{range} = 1966-1977 \quad T(0.05) = 2.353 \quad T(0.10) = 1.638 \]

(8) \[ \log(PARTNW) = -2.41 + 0.16 \log(PARTNW) - 0.08 \log(RGDP) - 0.13 \log(AVRWW) + 0.13 \log(AVRWW) + 0.09 \log(RDEF) + 0.02 \log(RGEXHOM) + 0.03 \times DST + 0.03 \times DS0 \]
\[t \ (-2.63) \ (0.80) \times t-1 \ (-0.34) \times t-1 \ (0.50) \times t-1 \ (2.75) \times t-1 \ (0.60) \times t-2 \ (1.03) \times t-1 \ (1.14) \times t-1 \]

\[ R^2 = 0.897 \quad \text{range} = 1962-1978 \quad T(0.05) = 1.360 \quad T(0.10) = 1.397 \]
(Table 5.3, Continued)

(9) \[ \log(\text{LW} / \text{LW}) = -0.41 - 0.66 \log(\text{LW} / \text{LW}) \]
\[ t \quad t \quad (-0.43) \quad (-3.82) \quad t-1 \quad t-1 \]
\[ - 0.15 \log(\text{RGDP}) + 0.05 \log(\text{IMMIG} - \text{EMIG}) \]
\[ (-0.84) \quad t-1 \quad (1.97) \quad t-2 \quad t-2 \]
\[ + 0.42 \log(\text{RWASERV}) - 0.19 \log(\text{INT}) \]
\[ (2.34) \quad t-1 \quad (-5.06) \quad t-2 \]
\[ + 0.03 \log(\text{BSTRIKE}) + 0.91 \log(\text{WUNIVS}) \]
\[ (4.37) \quad t-1 \quad (4.23) \quad t-1 \]
\[ - 0.05 \text{DST} \]
\[ (-2.87) \quad t-1 \]

\[ R^2 = 0.99 \quad \text{range} = 1966-1976 \quad T(0.05) = 2.920 \quad T(0.10) = 1.896 \]

(10) \[ \log(\text{PARTNW} / \text{PARTW}) = -2.73 + 0.41 \log(\text{PCCGDP}) \]
\[ t \quad t \quad (-3.04) \quad (0.69) \quad t-2 \]
\[ - 0.05 \log(\text{IMMIG} - \text{EMIG}) + 0.28 \log(\text{AVRWWW}) \]
\[ (-1.55) \quad t-2 \quad t-2 \quad (0.81) \quad t-1 \]
\[ - 0.41 \log(\text{AVRWWW}) + 0.17 \log(\text{DEFS}) \]
\[ (-2.91) \quad t-1 \quad (2.20) \quad t-1 \]
\[ + 0.03 \log(\text{WKSTOP}) + 0.04 \text{DST} \]
\[ (3.84) \quad t-1 \quad (1.18) \quad t-1 \]

\[ R^2 = 0.941 \quad \text{range} = 1966-1978 \quad T(0.05) = 2.015 \quad T(0.10) = 1.475 \]

* See notes to table 5.1.

nonwhite to white employees covered by statutory minimum wage determinations enacted by the Wage Board) is assumed to
inversely reflect the extent of apartheid in the sense that a rise in this ratio is associated with a diminution of apartheid. On the other hand, CIBURS (the number of coloured and Indian adults placed in employment annually by government labour bureaux per one thousand of the coloured and Indian population) is a direct index of the extent of apartheid. Labour bureaux are one of the chief instruments of influx control (see appendix 2), and the volume of their activity can therefore be regarded as a useful indicator of the extent to which apartheid policy is being enforced. The same is true of the variable PASLAW (the number of persons prosecuted annually for offences relating to reference books, influx control and other "pass law" violations) and PASLAWS, which is the same series weighted by the size of the total black population.

The regressors used in table 5.4 include a number of those which appeared in tables 5.1 to 5.3, as well as AVRWUUNSK, which is the average annual nonwhite wage rate paid in the mining sector, and is intended to represent a general measure of the unskilled wage rate. Since apartheid is approximated more closely by the dependent variables in this table than by those of the previous tables, it is perhaps not surprising that the most consistently significant results are to be found in table 5.4. There is a strong negative correlation between the real gold price (RPGM or RPGC) and the level of apartheid in all the equations which contain this variable as a regressor.

*See footnote 9 to chapter 3.*
Furthermore, in equations 11, 12 and 15, there is a significant negative relationship between government spending on the black homelands (a proxy for one component of the costs of maintaining apartheid) and the extent of enforcement of apartheid laws or ideology. In equation 15 there is also a significant negative correlation between real per capita defence expenditure (DEPSP) and the number of "pass law" prosecutions. In equation 13 the regressor WUNIVS may be regarded as a proxy index of the proportion of the white population who are non-workers, and it demonstrates a strong inverse relation to the PASLAWS measure of apartheid enforcement. In equations 12, 13 and 14, inclusion of the dummy variables DST and DSO suggests an appreciable decline in the application of apartheid policy consequent upon exogenous upward shifts in the apartheid cost function due to increased levels of internal black resistance.

(5.4) Conclusions and Avenues for Further Research

As pointed out in section 5.2 above, no definitive quantitative conclusions can be derived from the regression analysis undertaken in the present chapter. This is the result of data problems which inevitably preclude correct specification and undermine the reliability of estimates. Under such conditions, the purpose of empirical work cannot extend much beyond an attempt to verify certain "tendencies towards correlation" which are implied by the theory in question. To the extent that this is successful, some "circumstantial evidence"
### Table 5.4: Regression Results - Direct Measures of Apartheid Enforcement *

\[(11)\] \[\log(WADETS) = -5.10 - 0.32\log(WADETS) + 0.17\log(RWASI) + 0.35\log(RPGM) - 0.09\log(RWASERV) - 0.36\log(CPI) + 0.19\log(RDEF) + 0.35\log(REGEXHOM) - 0.02\cdot DST\]

\[
\begin{align*}
\text{t} & \quad (-1.57) \quad (-0.65) \quad \text{t-1} \\
0.32 & \quad \text{t-1} \quad (3.18) \quad \text{t-1} \\
-0.12 & \quad \text{t-1} \quad (-0.95) \quad \text{t-1} \\
0.91 & \quad \text{t-1} \quad (3.52) \quad \text{t-2} \\
\end{align*}
\]

\[R^2 = 0.98\] \[\text{range} = 1966-1978\] \[T(0.05) = 2.132\] \[T(0.10) = 1.533\]

\[(12)\] \[\log(CIBURS) = 2.92 + 0.23\log(CIBURS) + 0.55\log(RGNP) - 0.61\log(RPGM) + 0.25\log(AVRWUNSK) + 0.08\log(RDEF) + 0.06\log(WKSTOPS) - 0.50\log(RegEXHOM) - 0.13\cdot DST\]

\[
\begin{align*}
\text{t} & \quad (1.98) \quad (0.85) \quad \text{t-1} \\
1.66 & \quad \text{t-2} \quad (-5.56) \quad \text{t-2} \\
1.40 & \quad \text{t-1} \quad (0.50) \quad \text{t-1} \\
1.84 & \quad \text{t-2} \quad (-3.04) \quad \text{t-1} \\
\end{align*}
\]

\[R^2 = 0.993\] \[\text{range} = 1967-1978\] \[T(0.05) = 2.353\] \[T(0.10) = 1.638\]
\[(13) \quad \log(\text{PASLAWS}) = 1.69 + 0.35\log(\text{PASLAWS}) + 0.77\log(\text{RGNP}) + 0.09\log(\text{AVRWUNSK}) \\
\quad t \quad (0.55) \quad (1.73) \quad t-1 \]

\[+ 0.60\log(\text{DEFSP}) \quad - 2.97\log(\text{WUNIVS}) \\
(1.57) \quad t-2 \quad (-3.27) \quad t-1 \]

\[- 0.26\log(\text{DST}) \quad (-2.65) \quad t-2 \]

\[\bar{R} = 0.978 \quad \text{range} = 1967-1976 \quad T(0.05) = 2.353 \quad T(0.10) = 1.638 \]

\[(14) \quad \log(\text{PASLAWS}/\text{PASLAWS}) = 0.05 \\
\quad t \quad t-1 \quad (0.46) \]

\[- 0.31\log(\text{RPGC}/\text{RPGC}) \quad (-1.16) \quad t \quad t-1 \]

\[- 0.05\log(\text{BSTRIKE}/\text{BSTRIKE}) \quad (-0.60) \quad t \quad t-1 \]

\[- 0.38\log(\text{RGEHOM}/\text{RGEHOM}) \quad - 0.27\log(\text{DSO}) \quad (-0.79) \quad t \quad t-1 \quad (-2.20) \quad t-1 \]

\[\bar{R} = 0.211 \quad \text{range} = 1966-1981 \quad T(0.05) = 1.796 \quad T(0.10) = 1.363 \]
may be provided in favour of that theory. It is with this limited objective in mind that we have embarked upon the analysis described in the previous section, and the significance of our conclusions should be judged accordingly.

The theory of the apartheid polity developed in chapter 4 implies a negative relationship between the extent to which apartheid policies are enforced, defended and maintained on the one hand, and the gold price, the unskilled wage rate, exogenous shift parameters in the apartheid cost function, and the proportion of the white electorate who are non-workers, on the other hand. The predictions of the theory with regard to tax rates could not be tested due to a lack of data, except for some cursory and inconclusive analysis of company taxes. The most important results are therefore those which relate the level of
apartheid (whether measured directly, or in terms of educational access or industrial employment) to the various explanatory variables suggested by the theory. Since the theory itself provides no explicit guidelines as to the correct specification of the regression equations, it is hardly surprising that the results presented in tables 5.1 to 5.4 are not always consistent. The only legitimate conclusion is that we have not succeeded in either confirming or refuting our theory. We have provided some "circumstantial evidence" in favour of the idea that the system of apartheid is responsive to the costs of its own maintenance and other objective economic constraints, although admittedly, this itself is the outcome of our preconceived judgements reflected in the chosen specifications.

Nevertheless, we have shown how it is possible for such circumstantial evidence to be accumulated in the future. It would first be necessary, in the context of an ongoing research program, to obtain improved data. The empirical exercise undertaken in this study has, if nothing else, at least indicated which types of data may be useful in testing such a theory, and how these data may be interpreted and analyzed in an operational manner. It would be particularly helpful if the number of data observations contained in several of the time series used in this chapter could be increased, so that future empirical work would not be constrained by inadequate degrees of freedom. This would also facilitate the use of additional dummy variables to capture the effects of important historical events.
which currently lie outside the range of most of our regressions. (For example, it would be interesting to examine the impact on apartheid of the Sharpeville incident of 1960.8) Data for nonwhite strike activity, work stoppages and other indexes of internal opposition have been shown to be particularly useful. The same is true of such explanatory variables as national defence expenditure and expenditure on maintaining the institutional structure of the black homelands. Collection of additional data of this type (including a consistent time series of relevant components of government spending on Bantu administration and other "apartheid departments") is a necessary task for any further research. Only once improved data have been obtained will it be desirable to proceed to the application of more sophisticated econometric techniques. At that point it will also be possible to judge the success of the model's predictions relative to those of alternative hypotheses.

8On March 21, 1960, the police fired on a crowd of unarmed blacks demonstrating against the pass laws. The incident signalled not only a rise in domestic opposition to apartheid policy, but also an increase in the level of international opprobrium. The Sharpeville shootings, coinciding with an increase in African membership of the United Nations, brought the conduct of South Africa to the attention of the Security Council which passed a resolution (S/4300) stating that the South African government's policies had "led to international friction and if continued might endanger international peace and security". The support of the United States for the resolution marked a dramatic change in its attitude to South Africa (Kuper, 1971, p. 470; Spence, 1971, p. 513).
VI. IMPLICATIONS AND CONCLUSIONS

(6.1) Concluding Remarks

In chapters 1 and 2 it is shown that the methodology of neoclassical economics is able to accommodate an explanation of various forms of behaviour which are normally regarded as lying beyond the boundaries of economics. We have been particularly concerned in this study with the application of the postulate of utility maximization and rational individual choice to the structure and change of political institutions. To this end, it is necessary to review in some detail the contributions of both modern public choice theory and the "new" economic history. The common problematic addressed by these two bodies of literature is that of the transformation of individual utility maximizing behaviour into collective choice of institutional or contractual forms. The structure of property rights and the costs attaching to transactions in these rights between individuals or groups will inevitably constitute important constraints relevant to this process of social or political choice.

In chapter 3 we survey a number of approaches to the explanation of apartheid or race discrimination which are current in the social sciences. Certain economic theories of discrimination and sociological perspectives on racially differentiated communities suggest that a set of institutions,
such as those constituted by South African apartheid, may be the outcome of rational choice rather than traditional belief or atavistic prejudice. In an attempt to formalize this idea, we proceed in chapter 4 to develop a model of the South African polity, based on the simplest assumptions of individual utility maximization. A highly abstract general equilibrium representation of the economy is augmented by an equally simple model of collective choice founded on the concept of a predatory state. It is thereby shown that the extent to which apartheid institutions are enforced or applied can be determined endogenously through the operation of a number of economic and political constraints perceived by the ruling group, of which the most important are the costs incurred in administering, defending and policing the apartheid system. A theory of the state framed in these terms is capable of yielding empirically testable (i.e. potentially refutable) implications. For example, it is predicted that the level of enforcement of apartheid will depend not only on the costs of maintaining apartheid institutions in the face of internal and external political resistance, but also on other exogenous factors such as the occupational structure of the white electorate and the gold price.

In chapter 5 the problems inherent in submitting such a model of political behaviour to the litmus test of real-world data are described. Econometric theory warns against the dangers of attributing too much credibility to statistical tests of
significant when data problems and difficulties of model specification are present. Nevertheless we are able to show how apartheid institutions may be endowed with quantitative substance in such a way as to render operational the theory proposed in chapter 4. In the remaining section of this chapter, we will attempt to locate the approach suggested in this study within the ongoing debate over the survivability and evolutionary or revolutionary potential of the apartheid system. It should be emphasized that the remarks made in this regard are speculative, and are included only to place in broader perspective the implications of our economic model of the apartheid polity.

(6.2) The Future of the Apartheid System

It has become almost obligatory to conclude studies of contemporary South African society with speculation or "informed guesses" by the author about the survivability of apartheid. No attempt will be made here to predict the future in a deterministic fashion. In the words of Hicks:

... we shall not be able ... to extrapolate into the future; all we shall be able to do, all the economist is ever able to do, is to speculate about things which, more or less probably, may happen (1977, p. 8).

The best that we can hope to achieve is to show what implications the analysis in chapters 4 and 5 holds for the ongoing debate on the possibilities of future change in the apartheid system. To this end it will be useful to provide a brief review of the different perspectives on such change which
are currently popular in the social sciences literature.

One approach, which (as noted in chapter 3) is particularly prevalent among liberal economists, is the view that economic growth and development will gradually erode away the apartheid edifice. Thus Bromberger (1974) proposes that white prosperity and white security or supremacy are substitute inputs into a "social production function". For example, if the practice of allowing blacks to perform increasingly sophisticated technical and organizational work by constantly redefining apartheid restrictions were abandoned in order to promote "white security", then "the authorities would be substituting supremacy for prosperity on the margin and the opportunity cost of supremacy in terms of prosperity would increase over time as actual output and consumption fell further below potential levels" (Bromberger, 1974, p. 71). It is Bromberger's belief that whites will, in fact, trade "security" for increased prosperity and will accommodate the needs of a stable urban black labour force by making it ideologically acceptable to administer the colour bar with increasing flexibility. In this way, economic growth will lead to an enlargement of the feasible set of desirable social arrangements (Ibid., p. 63).

Not all theorists subscribe to the view that there is an inherent incompatibility between apartheid and economic growth (see chapter 3, section 3.4). Nevertheless, in an era marking the end of political colonialism, most critical analysts of South Africa have forecast the inevitable failure of apartheid
(Adam, 1971, p. 4). The increasing polarization between opposing blocs of Afrikaner and African nationalism was believed to presage revolutionary change. "Hence, almost all social science studies on South Africa published during the sixties have predicted violence, bloodbath, unrest, and upheaval for this polarized situation" (Adam, 1971, p. 13). In the light of the remarkable durability and resilience of the apartheid regime throughout the 1970s, however, many writers have now come to believe that it is extremely unlikely that white-rulled South Africa will, in the foreseeable future, succumb to violent opposition, either from inside or outside the country. It is claimed that the apartheid state is simply too powerful relative to its enemies. For example, Johnson (1977) points out that the South African government is not comparable to previous white regimes in Africa, since it does not depend upon a metropolitan country to protect it from the discontent of local blacks:

The South African state is incomparably stronger than that of any earlier white society in Africa. In the face of possible internal rebellion, at least, white South Africa can look after itself ... There is no colonial power to exercise leverage towards black majority rule. The laager is intact and can be defended (Johnson, 1977, p. 305).

Johnson speculates that challenges to the apartheid state originating internally - from black urban workers, the urban unemployed, or from rural Africans - are unlikely to succeed in bringing about significant liberalization. If the government adopts a sufficiently ruthless policy of suppression at home, and an accommodative, laissez-faire approach to its immediate
northern neighbours, there is no reason, according to Johnson, why it should not be able to survive well into the twenty-first century (1977, p. 314). This view is corroborated in a study by Hanf, Weiland and Vierdag, who maintain that neither guerilla warfare nor internal demonstrations and strikes will constitute a serious threat to the existing system of domination (1981, pp. 409, 419). Furthermore, according to Gann and Duignan, South Africa's industrial strength, its ability to pay for imports in gold and the nature of international trading "leaks" have rendered the country largely immune to formal trade boycotts or sanctions (1979, p. 29). In Johnson's view, however, any dismantling of apartheid which does occur in the future will have to be induced from outside. He bases this opinion upon the historical precedent created by transitions to black rule in other African countries, where pressure placed upon minority white regimes by metropolitan colonial countries was always the catalyst for change (1977, pp. 320-327). It is conceivable that in the future some foreign power, perhaps the U.S., may come to adopt an informal "metropolitan role" vis-a-vis South Africa, but until such time the South African apartheid state should be able to resist all adversaries. This view is shared by Gann and Duignan:

... the South African establishment is not likely to be overthrown for a long time to come, if at all. The opposition is divided. The army and the administration are neither inefficient, corrupt, nor subject to revolutionary infiltration ... The country's military expenditures, though impressive by African standards, do not constitute an insupportable burden. South Africa is not on the point of breakdown (1978, p. 62).
The idea that the apartheid system is virtually impermeable to change is based upon the belief that white South Africans will solidify into a monolithic and intransigent political bloc (Johnson, 1977, p. 304). It also tends to deny the rationality of the apartheid system in the face of changing constraints. Adam and Giliomee (1979) point out that South Africa's ability to change depends upon how the ruling group perceives the costs of apartheid relative to the advantages of abandoning past beliefs. Increased pressure does not necessarily mean that a threatened group will close ranks in obstinate defiance (Adam and Giliomee, 1979, pp. 64, 301). The apartheid system is not the outdated relic of a dying colonialism, but is in fact one of the most advanced and effective patterns of rational, oligarchic domination (Adam, 1971, p. 16). In addition, the white constituency is heterogenous, in the sense that various sections are affected differently by the costs and benefits of particular institutions, and the relationship between these costs and benefits ultimately determines the potential for social change. This suggests that the elimination of apartheid may be possible without requiring a cataclysmic revolution. In Adam's words:

It is likely that the evolutionary change of white South Africa will take place through more concessions under the pressure of increasingly powerful challenges that would otherwise jeopardize white interests altogether through a structural change. The question of transfer of power could develop into a problem of sharing power, not because both antagonists have become less hostile toward each other, but because they both would lose more by insisting on the final solution of their hostility than by settling for mutual concessions on the basis of mutual strength (1971, p. 168).
If such a reasoned and rational adjustment in the distribution of political power is to take place, the question immediately arises as to the specific institutional form it is likely to take. The work of the political scientist Arend Lijphart (1977) has been particularly influential in shaping the opinions of those who believe in the possibility of evolutionary democratization in South Africa. Lijphart criticizes the view that social homogeneity is a necessary condition for democratic government, and points to the fact that several "plural societies" in Europe are also stable democracies.† The political system which facilitates such stability is referred to by Lijphart as "consociational democracy". The latter is designed to counteract the centrifugal tendencies inherent in a plural society by providing for cooperative behaviour on the part of the leaders of the different segments of the population. Consociational democracy can be defined in terms of four characteristics: (i) government by a "grand coalition" of political elites who jointly decide upon those matters affecting all groups in common; (ii) mutual veto or "concurrent majority rule" to protect vital minority interests; (iii) strict proportionality of political representation, civil service appointments and allocation of funds; and (iv) a high degree of autonomy for each segment to run its own internal affairs (Lijphart, 1977, p. 25). If consociational democracy has worked

†For a definition of pluralism, see chapter 3, section 3,2. The term "democracy" is defined in a broad sense to denote polyarchic decision making.
in the Netherlands, Belgium, Switzerland and Austria, then Lijphart maintains that it could also be tried in certain less developed countries.

This idea has been seized by some theorists as a possible means of effecting a transition from apartheid to an integrated nonracial society in South Africa. Thus Thomas (1977) speculates that a movement towards consociationalism would be feasible if provided with enough support from the liberal elements within the ruling National Party, the business community, churches, black leaders and foreign governments. He recognizes, however, that such a change would be opposed strongly by many radicals and liberals who reject any political dispensation based on racial cleavages, and would also be resisted by white conservatives. The success of consociational democracy, according to Thomas, presupposes that South African blacks and international pressure will not allow any long-term strategy which is not based on the territorial unity of the country and a system of multiracial power-sharing (1977, p. 21). In their extensive survey of opinions and attitudes towards social change in South Africa, Hanf, Weiland and Vierdag (1981) conclude that the white electorate poses no insurmountable obstacle to the peaceful evolution of a consociational system (providing the political leadership acts decisively). They also find that the black political leadership is seriously prepared to consider compromises along these lines, and that the majority of urban blacks would accept them. The chief obstacle to change lies with
the position of the white power-elite, which is oriented towards the status quo (Hanf, Weiland and Vierdag, 1981, pp. 398-401). One possibility is that a split may emerge between the liberal and conservative elements in the white leadership. According to Schlemmer, however, such a split is unlikely in the case of the ruling National Party which articulates the broad interests of a "popular social communalism" and is therefore not susceptible to factional divisiveness (1977, p. 14). Hanf, Weiland and Vierdag believe that the conservative wing of the National party is most likely to prevail and that a form of "sham consociationalism" will be adopted in order to disguise the perpetuation of minority rule and thereby prolong the survival of the apartheid system (1981, p. 419).

Lijphart himself admits that the likelihood of true consociational democracy emerging in South Africa is not very great. In fact Lijphart, following van den Berghe, identifies South Africa as one of the rare cases where discrepancies in levels of development are so extreme that one group can easily achieve a monopoly over the means of violence, which severely reduces the chances of democracy, even of the consociational variety (1977, pp. 235-236). The reasons for Lijphart's pessimism are the same as the reasons why, in chapter 4, we opted for a predatory rather than contractarian theory of the South African state.

A number of basic conditions for consociational democracy, as identified by Lijphart, are absent in the South African
context. For example, Lijphart requires that the elites who form the "grand coalition" be recognized as legitimate representatives by their constituents (Lijphart, 1977, p. 53), whereas in South Africa this condition would probably be fulfilled only for the white leaders (Schlemmer, 1977, p. 14; Adam and Giliomee, 1979, p. 290). Another condition for consociational democracy is the existence of "overarching loyalties" and "crosscutting cleavages" between groups, which facilitates moderate attitudes and actions (Lijphart, 1977, pp. 54, 75). It is doubtful that these prevail to a sufficient extent between black and white South Africans. Lijphart maintains that small countries are most suitable for consociational democracy because a feeling of vulnerability and insecurity provides strong incentives to maintain internal solidarity. However, foreign threats need to be perceived as a common danger by all segments of the society in order to have a unifying effect (Lijphart, 1977, pp. 66-67), and this is not the case in South Africa where only the whites are threatened (Adam and Giliomee, 1979, p. 301). Also, consociational democracy requires that the non-elite public be "politically inert" and display "deferential attitudes" towards the group leaders (Lijphart, 1977, p. 169). In South Africa, however, blacks especially are becoming increasingly politicized.

We will not enter the debate upon the feasibility or likelihood of consociational democracy in South Africa. It will suffice to note that the new constitution, adopted in 1983,
appears to vindicate the prediction made by Hanf, Weiland and Vierdag (1981) that a "sham consociationalism" would be introduced in an attempt to accommodate opposition to the apartheid regime. The analysis developed in this thesis leads us to agree with Adam (1971) and Adam and Giliomee (1979) that the apartheid system represents an essentially rational response of a heterogenous white oligarchy to the costs and benefits associated with alternative institutional arrangements. This ruling oligarchy is neither monolithic nor intransigent, but has displayed a remarkable pragmatism in adjusting institutional forms and policies to changing constraints. As particular aspects of apartheid have become too costly to maintain and defend, they have been abandoned or modified. If the system as a whole became so expensive as to eliminate all benefits accruing to its protagonists, there is no reason to believe that it would not be dismantled. While these benefits are relatively simple to identify, the costs of apartheid derive from numerous sources, both internal and external. Political pressure aimed at destroying apartheid can therefore take many different forms and emanate from widely disparate groups of opponents. In an analytical sense, the effect of increased insurgent activity on the borders of South Africa is identical to that of the election of a Democrat to the U.S. presidency or the registration of a black trade union in Durban. Our model has shown that all such influences may be incorporated in a similar way in the political decision making process.
APPENDIX 1: THE NEW ECONOMIC HISTORY

As indicated in chapter 2 (section 2.1), one of the characteristics of the so-called "new" economic history has been the application of quantitative techniques to historical explanation (cliometrics). Fogel identifies the fundamental methodological feature of the new economic history as "its attempt to cast all explanations of past economic development in the form of valid hypothetico-deductive models" (1971a, p. 10). In the course of developing and testing these models, the new brand of historian is forced to recognize the intimate relationship between measurement and theory (Ibid., p. 7), and thus to combine a strongly empirical orientation with deductive reasoning.

This may be expressed as a theoretical commitment to the validity of operationalizing every research problem, considering most forms of information to be numbered events (observations) in one or more sequences or classes dependent upon or independent of other sequences (Rowney and Graham, 1969, p. viii).

Of course, quantification of any kind must not diminish the historian's control over his material.

On the contrary, the scholar needs to have the distinct sense that his control has been increased before any quantitative procedure will warrant confidence (Ibid., p. ix).

This presupposes the existence of an organizing theory prior to the employment of any quantitative techniques.

The work of the new economic historian is seldom characterized by the application of the most advanced econometric methods. Indeed, according to Wright:
The distinctive contribution of the New Economic History has not been so much the use of "econometrics" but the use of economics - the application of standard economic reasoning in the posing and answering of historical questions (1971, p. 416).

Hicks (1977) maintains that the role of economic theory is to provide "general ideas" which can be used as a means of ordering historical material. Every historical event has some unique aspect, but most are also members of larger groups and can thus be discussed in terms of the notion of statistical uniformity. By focusing upon the norm or average of the group, the economic historian attempts to discover some extra-historical support for the observed historical pattern (Hicks, 1977, pp. 2-3). Wright points out that many historical issues have been substantially clarified simply by analytical thinking and measurement, without the necessity for elaborate quantitative methods. As long as the basic econometric technique of drawing inference from non-experimental data is used, however, such studies will continue to qualify as examples of "econometric history" (Wright, 1971, p. 417).

The union between measurement and theory is most clearly evident when the historian attempts to establish the net effects of innovations, institutions or processes on the course of economic development. This type of analysis involves a comparison between what actually happened and what would have happened in the absence of the specified circumstance (i.e. the construction of a "counterfactual"). The economic historian therefore requires a set of general statements (a theory or a model) that will enable him to deduce a counterfactual situation
from institutions and relationships that actually existed (Fogel, 1971a, p. 8).

Applications of the new economic history and cliometric methods have substantially altered some of the best established propositions of traditional historiography. One of the first and most influential reinterpretations concerns the effects of slavery on the development of the pre-Civil War American South. Conrad and Meyer (1958) challenged the traditional view that slavery was responsible for retarding the growth of the South's economy and that it was rapidly turning into an unprofitable institution. Their calculations of the rates of return accruing to slaveowners showed instead that slavery was a viable economic system. In a subsequent study, Fogel and Engerman (1974) have tested the traditional hypothesis that, immediately prior to the Civil War, slaveowners were extremely pessimistic about the future of their "peculiar institution" due to the impending exhaustion of existing cotton lands and the unstable state of the international cotton market. Fogel and Engerman construct an "index of sanguinity" of slaveowners, which is essentially the ratio of the purchase price of slaves to their annual average rental rate. They hypothesize that, if investors expected a more lucrative future, the purchase price of slaves would rise relative to the rental rate (1974, vol. 1, p. 103). Contrary to the traditional view, Fogel and Engerman find that during the 1850s sanguinity was rising rapidly (accounting for 75% of the rise in slave prices) indicating that slaveowners not only
expected their system to endure, but even foresaw an era of prosperity (Ibid., p. 105).

A well known instance of counterfactual modeling is Fogel's attempt to determine whether railroads were a necessary condition for extending the area of commercial agriculture in the U.S. (1971b). In order to do this it is necessary to perform a counterfactual experiment - i.e. to determine how much of the land actually settled after the advent of railroads would have been settled in their absence. Fogel postulates that even without railroads, a certain area of farmland would have remained in use as long as the rental value of that land was at least as great as the transportation costs. Therefore, the theory of rent may be used to calculate that area of land and thereby establish the boundaries to feasible agriculture in a non-rail society.

The methods of the new economic historians have not escaped severe criticism on the part of their more traditional colleagues. Some historians believe that it is fruitless to apply powerful statistical techniques to economic history because the available data are poor and unreliable. However, it could be argued with equal force that the correlation runs in the opposite direction. When the data are very good, simple statistical procedures will suffice; the poorer the data, the more powerful the methods which have to be employed (Fogel, 1971a, p. 8). Desai (1968) maintains that the application of quantitative techniques to historical problems may serve not
only to test the validity of existing economic theories, but may even facilitate the development of new theories:

Appropriate theory will not just arrive on the scene fully fledged and ready for use. Many empirical regularities will have to be discovered by empirical work. In the absence of a theoretical framework, we introduce certain variables on grounds of quantitative institutionalism - because we know the variable is important and its effect can be understood ex post but not predicted a priori (Desai, 1968, p. 7).

Fritz Redlich (1965) argues that attempts to answer counterfactual questions by the use of hypothetico-deductive models constitute both the most novel and the most dubious methodological aspect of the new economic history. He maintains that counterfactual propositions are fundamentally alien to economic history because they are untestable and thus comprise at best "quasi-history" (Redlich, 1965, pp. 490-491). Redlich refers to the counterfactual method rather pejoratively as "conjectural history", because it is based on "figments", which are assumptions having no counterpart in reality (Ibid., p. 484). However, Murphy (1965) identifies those features of the new history which Redlich finds most offensive as its chief virtues. By rigorously developing hypothetico-deductive models, cliometicians are effectively providing the discipline of economic history with a defensible set of empirical techniques (Murphy, 1965, p. 145). By contrast, the "old" economic history produced "explanations" which did not follow from "a train of deductive logic", nor did they rest on statistical inference. Rather, these "explanations" were "urged upon the reader by a whole mass of descriptive sentences which attempted to warrant
the acceptance of the "explanation" (Ibid., p. 136). The strongest defence of counterfactual experimentation as a legitimate tool of historical explanation has come, not surprisingly, from Fogel. He argues that if we are to exclude from history all those studies which are based on counterfactual propositions, "we will have to expurgate not only the new work, but much of the old work as well" (Fogel, 1971a, p. 10). Traditional economic history is full of hidden counterfactual assertions. They occur in any discussion which makes a legal, social, technological, administrative or political innovation a cause of a change in economic activity.

All of these arguments involve implicit comparisons between the actual state of the nation and the state that would have prevailed in the absence of the specified circumstance (Ibid., p. 10).

The only difference between the old and new history in this regard is that the latter tends to make its counterfactual propositions explicit, whereas the former does not. In the words of Cochran:

Historians, economic or otherwise, have necessarily approached their work with at least implicit models to guide them, and all history is a tissue of presuppositions and resulting conclusions (1969, p. 1566). In chapter 4 we construct a relatively formal explanatory model of the development of the apartheid state, and subject it to some empirical testing in chapter 5. Our method is thus in accord with the recent movement towards cliometric techniques. While we do not resort to explicit counterfactual modeling, we tend to agree with Fogel that there is an element of
counterfactual speculation present in any attempt to explain the evolution of social institutions, and this study is no exception.
APPENDIX 2: A BRIEF DESCRIPTIVE SURVEY OF THE INSTRUMENTS OF APARTHEID POLICY

The legislative and administrative instruments of apartheid may be divided conceptually into three categories: (i) those providing for the physical or geographical separation of the races, (ii) those affecting the operation of the labour market, and (iii) those measures concerning the overall socio-economic status of blacks, of which discriminatory educational policy is the most important. We will deal with each of these in turn.

(A2.1) Geographical Separation ('Grand Apartheid')

One of the primary ideological principles of apartheid is that blacks within white areas are to be regarded merely as "temporary sojourners", who are tolerated only in so far as they are necessary to the white economy (Griffiths and Jones, 1980, p. 144). Apartheid itself, however, represents the final stage in a long process of evolution of racial differentiation and segregationist policy (Rhoodie and Venter, 1960, p. 243). The earliest contacts between black and white communities at the eastern frontier of the Cape colony resulted in efforts by the colonial administration to establish "native reserves" exclusively for black occupation (see chapter 4, section 4.1). Similar policies of territorial separation were subsequently adopted by the Boer republics north of the Orange River (Rhoodie and Venter, 1960, p. 92). Restriction on the movement of blacks from tribal districts to white-occupied areas of the country has
been achieved in a number of ways - by direct controls on geographical mobility, by the denial of civil rights within "white" South Africa, and by attempting to increase the attractiveness of the traditional black "homelands" (Griffiths and Jones, 1980, p. 144).

The Native Land Act of 1913 contained a schedule of all existing tribal land, mission reserves and some African-owned farms. In terms of the act, Africans were not allowed to acquire land outside the "scheduled areas", while non-Africans could not occupy land within these areas. Another important piece of early segregationist legislation was the Native Urban Areas Act of 1923, which was essentially a consolidation of 41 existing statutes and ordinances. The act provided mainly for residential segregation and the control of black influx into the cities (Hutt, 1964, p. 128; Griffiths and Jones, 1980, p. 46; Hoodie and Venter, 1960, pp. 123-124). It was succeeded in 1945 by the Native Urban Areas Consolidation Act (Jones and Griffiths, 1980, pp. 63-75). Section 10 of this act defined the circumstances under which a black person may enter and remain within a prescribed white area. Specifically, no black may occupy such an area for more than 72 hours unless he qualifies as an "urban black", defined as someone who has resided there continuously since birth or for at least fifteen years, or has worked uninterruptedly for the same employer for at least ten years (Griffiths and Jones, 1980, p. 46). The Development Trust and Land Act of 1936 added a number of "released areas" to those
scheduled for black occupation in the 1913 act. This additional land has gradually been acquired since 1936, and approximately 14 percent of the total land area of South Africa now consists of scheduled and released areas.

One of the central tenets of apartheid ideology is that blacks be permitted to exercise political self-determination within these areas. The Black Authorities Act of 1951 accordingly commenced a process of devolution of local political authority to the homelands. This was followed by the Promotion of Black Self-Government Act of 1959, which paved the way for the Transkei to become the first self-governing black territory in 1963. It was recognized that if the reserves were to obtain political sovereignty, they would also have to become more viable economically. In 1955 the report of the Commission for the Socio-Economic Development of the Bantu Areas ("Tomlinson Commission") recommended the creation of a class of full-time farmers settled on economically feasible land units, and the simultaneous establishment of non-agricultural sectors within the reserves to absorb the population displaced by land reform and additional population growth (Knight and Lenta, 1980, pp. 175-176). In an attempt to raise levels of output and productivity in the black rural areas, the Promotion of the Economic Development of Black Homelands Act was passed in 1958, and provided for the establishment of Economic Development Corporations to plan, finance and coordinate the development of the various homelands (Griffiths and Jones, 1980, pp. 148-149).
Government policy was also changed to permit and encourage white capital to enter the homelands on an agency basis (Knight and Lenta, 1980, p. 176). The Black Homelands Citizenship Act of 1970 and the Black Homelands Constitution Act of 1971 facilitated self-governing status for a number of black territorial authorities in addition to the Transkei, and prepared the way for full political independence. There are now three black states which are nominally independent of the Republic of South Africa.

In order to implement the apartheid ideal of complete separation of the races in all spheres of life, a complicated set of regulations governing the position of blacks within the "white" areas has come into existence. One of the key pieces of legislation in this regard is the Black (Abolition of Passes and Coordination of Documents) Act of 1952, in terms of which every black person over the age of sixteen is obliged to carry, and produce on demand, a "reference book" or identity document, which contains a record of the individual's employment history and constitutes the necessary permission required to remain within a particular "white" area (Jones and Griffiths, 1980, pp. 88-90). "All the typically totalitarian paraphernalia of central, regional, district and local African labour bureaux was created in 1952 ... to supercede the market by outright direction of African labour" (Hutt, 1964, p. 129). The 1979 report of the Commission of Inquiry into Legislation Affecting the Utilization of Manpower ("Rieckert Commission") recommended
that the government accept the permanence of urban blacks within "white" South Africa, at least for economic purposes if not in terms of political affiliation. This led the authorities to consider certain minor reforms, such as amendments to the 1945 Urban Areas Act to provide for nationwide mobility of urban blacks, and the delegation of influx control responsibility to local community councils in black townships. Africans are not the only blacks, however, to fall under the aegis of the grand scheme of apartheid. The Group Areas Act of 1966 prohibits any person from occupying premises in a "group area" which has not been proclaimed for his own particular race group. The practical effect of this law is to restrict the geographical mobility of Indians and "coloureds" (people of mixed race) within the urban areas.

(A2.2) Apartheid in the Labour Market

Steenkamp (1983) traces the origins of the economic colour bar back to the pre-Union era of diamond and gold mining, when white workers feared that blacks would be admitted to skilled jobs in large numbers, thereby placing downward pressure on skilled wages. Laws were enacted to exclude blacks from skilled occupations on the mines of the Transvaal and Orange Free State. The Union parliament's first colour bar law was the Native Labour Regulation Act of 1911, which consolidated earlier colonial labour legislation. It prohibited blacks from undertaking specified tasks, and thus initiated the principle of
racial job reservation (Rhoadie and Venter, 1960, p. 121).

The concept of white labour supremacy was entrenched by three acts passed by the Pact government in the 1920s (Nattrass, 1982, p. 76; Jones and Griffiths, 1980, pp. 23-29). The first of these was the Industrial Conciliation Act of 1924 (amended in 1937), which provided for collective bargaining and arbitration of disputes for employees defined to include whites only. In terms of the act, negotiations between employers and white workers would result in legally binding industrial agreements according to which the wage rates applicable to all grades of labour were determined. The Wage Act of 1925 applied to those industries and trades in which workers were not covered by the Industrial Conciliation Act. It established a Wage Board appointed by the Minister of Labour and entrusted with the task of setting minimum wages and investigating working conditions. The third important item of industrial relations legislation at this time was the Mines and Works Amendment Act of 1926, which reaffirmed the principle of race discrimination and job reservation in the mining sector (Houghton, 1973, p. 150). Other early legislative acts that contributed to the protection of white workers include the Apprenticeship Act of 1922, in terms of which the conditions laid down for apprenticeship effectively precluded blacks from qualifying as skilled artisans. One of the most significant policies introduced by the Pact government was the concept of "the rate for the job". This was usually implemented in the form of a standard wage rate for a particular
work category, maintained above the market-clearing level, and the effect was to prevent the entry of subordinate races or classes into the protected occupation. According to Hutt, the "rate for the job" principle was even more detrimental to blacks than formal job reservation or influx control:

It has tended to determine the broad occupational structure of society by authority instead of the market, and on a racial basis instead of by trainable ability (Hutt, 1964, p. 117).

The Industrial Conciliation Act was amended in 1956. Blacks continued to be excluded from the formal industrial relations framework established by the act, since only whites were permitted to belong to registered trade unions. Although black unions were legal, they could not be registered. The act provided for industrial council agreements between unions and management which could stipulate closed-shop arrangements and thereby exclude non-union labour (mostly black) from certain categories of employment. Until 1979 (when the Industrial Conciliation Act was amended again to allow for the registration of black unions), negotiations between black workers and employers could only be conducted at the level of the individual firm, under the provisions of the Black Labour Relations Regulation Act of 1953. This act established black "works committees" in firms with more than twenty black employees. Negotiations would take place between the works committee and management, and any disputes would be settled by regional committees in consultation with the works committee. Failing this, the issue would be referred to a Central Black Labour
Board, or even to the Wage Board itself, for binding arbitration (Jones and Griffiths, 1980, pp. 90-98). Although strikes were not actually illegal in terms of the 1953 act, the Minister of Labour could effectively prohibit any strike by black workers by referring the dispute to the Wage Board for a decision. Following widespread labour unrest in Natal in 1973, the act was amended to allow for the creation of "liaison committees" at firm level. The liaison committee differed from the works committee in that equal numbers of representatives were elected by workers and management. In addition, blacks were now permitted to sit on the Central Black Labour Board and to become Labour Officers, and permission was granted to strike on the same terms as unionized workers covered by the 1956 Industrial Conciliation Act. These measures enhanced the popularity of firm-level negotiating procedures, and a relatively large number of liaison committees was formed by workers and employers (Griffiths and Jones, 1980, p. 161). The government hoped that the liaison committee system would forestall the growth of the black trade union movement. However, the latter flourished after 1973, with a dramatic increase in membership as black workers realized that they had the power to force change through strike action. The Commission of Inquiry into Labour Legislation ("Wiehahn Commission") reported in 1979 that "the continued existence and growth of black unions outside the statutory system of negotiation could well bring extreme stress to bear on the system within a short period of time and pose a grave danger
to industrial peace" (Griffiths and Jones, 1980, p. 163). The 1956 Industrial Conciliation Act was therefore replaced by the Labour Relations Act of 1979, which extended membership of registered unions first to blacks permanently resident in "white" areas, and then, in 1981, to all black workers, including migrants, commuters and aliens (Steenkamp, 1983, p. 85). This provides one more indication of the fact that apartheid was never a dogmatically unbending set of policies, but has been applied with a remarkable degree of pragmatism. (See chapter, section 3.4, for further discussion of this point.)

The 1956 version of the Industrial Conciliation Act contained an important clause which had been missing from its 1924 and 1937 predecessors — namely, the infamous "Section 77" which contained provisions for direct racial job reservation (Hutt, 1964, p. 117). Its function was to enable the Minister of Labour to instruct a statutory body (the Industrial Tribunal) to investigate the desirability of reserving certain classes of work in certain areas for specified race groups (Jones and Griffiths, 1980, pp. 108-121). Although by 1975 only 2.5 percent of the country's labour force was affected directly by Section 77 determinations, the number of those indirectly affected was probably much larger because of the uncertainty which the existence of this section created among employers (Griffiths and Jones, 1980, p. 172). The latter may have been deterred from opening certain job categories to blacks if they feared that the
government would respond by extending Section 77 to cover their particular industry. In 1979 the report of the Wiehahn Commission recommended the repeal of Section 77, and the government concurred by omitting it from the new Labour Relations Act. Only five job reservation determinations continued to retain the force of law, although most of these have now been suspended. Once again, the rigidity of apartheid ideology was belied by its practical application in the face of real-world exigencies.

As we noted above, direct curbs on the occupational mobility of blacks were first introduced in the mining industry. The Mines and Works Act of 1956 reproduced and elaborated much of the earlier legislation. In terms of a series of regulations promulgated under this act, all the administrative and technical positions in the mining sector, together with numerous jobs involving responsibility and supervision, were reserved for "scheduled persons" only (defined as whites and coloureds). This was achieved by requiring a "certificate of competency" for these jobs, while denying the possibility of obtaining such a certificate to non-scheduled persons (Griffiths and Jones, 1980, p. 179). The statutory colour bar was first introduced to the non-mining sector in 1951, with the Building Workers Act, which prohibited the employment of black artisans in the construction industry in white urban areas. The 1959 Motor Transportation Amendment Act empowered the National Transportation Commission to require that members of a particular race be employed in
specific transport jobs (Steenkamp, 1983, p. 72).

The Black Labour Relations Act of 1964 served not only to regulate the movement of black workers between the homelands and the urban areas through the medium of labour bureaux, but also provided for effective racial job reservation (Steenkamp, 1983, pp. 69-70). Section 20A of this act enabled the Minister of Cooperation and Development (formerly Bantu Administration) to prohibit the performance of work or the employment of a black worker in a specified area, or class of employment, or in the service of a specified employer or class of employer, with the proclaimed intention of defusing any potential racial hostility or conflict in the field of employment (Griffiths and Jones, 1980, p. 176). This section was invoked in 1970 to prevent the employment of blacks in a number of occupations, such as sales clerk, receptionist, telephonist, cashier and typist. Although these restrictions were withdrawn in 1977, the section remained on the statute books. While the original 1964 act did provide for the training of blacks as construction workers, it was stipulated that they would only be able to practise their trade in the black homelands or townships (Steenkamp, 1983, p. 72).

Although the proclaimed purpose of the Physical Planning and Employment of Resources Act of 1967 was the encouragement of industrial decentralization, Section 3 of this act works as an effective instrument of job reservation. Its aim is to reduce the inflow of blacks into the main "white" industrial centres by limiting the number of new factories or the expansion of
existing ones. Firms which are designated by the act as "locality bound" are permitted to hire additional black workers as required, but those which are non-locality bound are assigned a fixed ratio of black to white workers (Jones and Griffiths, 1980, p. 175). The official intention is to encourage firms to decentralize to areas contiguous to the black homelands (so-called "border areas") where no restrictions are placed on the number of blacks who may be employed. The most important impact of the act, however, has been to inhibit black occupational mobility. An employer will be reluctant to promote a black employee to a position previously held by a white worker, since a newly recruited black will then be required to replace the promoted worker and this will violate the black-white ratio prescribed by the act (Griffiths and Jones, 1980, p. 178).

The 1966 Group Areas Act not only restricts the geographical mobility of Indians and coloureds, but also prevents blacks from holding managerial or entrepreneurial positions, and thus effectively promotes racial job reservation. The act has been applied in such a way as to prohibit a member of one race group, without a permit, from being employed by a member of another group in the latter's designated "group area", in an executive, professional, technical, administrative, managerial or supervisory capacity (Griffiths and Jones, 1980, p. 177). A number of other legislative impediments to black advancement or employment have functioned as instruments of job
reservation. For example, the minimum educational qualification required for acceptance as an apprentice was set by the 1944 Apprenticeship Act at a level sufficiently high to preclude most blacks. In any case, the 1966 Group Areas Act situated the majority of technical and vocational colleges in white areas, thus limiting black attendance. In addition, apprenticeship committees, which must approve acceptance of all apprentice applications, contain union representatives and generally reflect the racial policies of the (mainly white) craft unions. As a result, in 1977 only 1.9 percent of all apprentices in training were black (Griffiths and Jones, 1980, p. 180). One of the most effective means of achieving racial job reservation, however, was the inclusion of closed-shop arrangements in the 1956 Industrial Conciliation Act. Every grade of job covered by a closed-shop agreement was effectively barred to blacks, since blacks were denied membership of registered unions until 1979. A closed-shop agreement, once published, becomes legally binding, so that provision for such agreements in the 1956 act amounted to another form of statutory job reservation.

With the publication of the Wiehahn and Riekert Commission reports in 1979, South Africa entered a new phase of labour relations. The National Manpower Commission was constituted in that year as the chief instrument of the new dispensation (Steenkamp, 1993, p. 82). Influx control remains in existence, although the government has undertaken to ameliorate some of the "social problems" created by the system. The right of blacks to
reside in white areas has been accorded some recognition with the introduction of a 99-year leasehold arrangement. In addition, the restrictions formerly imposed on black businesses have been relaxed, and greater provision has been made for black local government.

(A2.c) Differential Access to Educational Opportunities

Even in the absence of explicit wage or job discrimination, human capital theory leads us to expect racial segregation of the labour market if one race group is largely excluded from attaining higher levels of education. Krueger remarks upon the possibility of this type of discrimination:

Since, in educational investment, the recipient of education collects the returns on his skills, it would be in white labor's interests to invest as much public capital in itself and as little in Negroes, as possible ... It is also possible that it might use its voting power to maintain a monopoly of skills... (Krueger, 1963, p. 434).

In fact, restrictions on human capital formation by blacks in the form of inferior educational opportunities provided by a white-dominated public schools system have been identified as important characteristics of a discriminatory labour market (Borcherding, 1977, p. 55). Thus Borcherding shows that segregation of public education can be an efficient means of achieving fiscal redistribution from blacks to whites. The decision to provide education collectively requires that each white individual obtain agreement from other whites to allocate funds to the education of his child, and the "price" for such
agreement is the education of all other white children. This is accomplished by means of implicit logrolling by political entrepreneurs seeking office. If blacks are excluded because they are disenfranchised, they will not be part of this logrolling procedure, and any black education provided by the white administration can be interpreted as resulting from a demand by whites for inputs complementary to those they own (Borcherding, 1977, pp. 55-56).

In South Africa, the set of government policies which impedes blacks from acquiring knowledge and skills appropriate for modern sector employment is identified by Knight and McGrath as one of the major instruments of apartheid, equalled in importance only by influx control and the homelands policy (1977, p. 246). Differential access to education is illustrated by the fact that more than 90 percent of urban male Africans had completed less than eight years of schooling in 1970, compared with 20 percent of equivalent whites. According to the 1970 Population Census, only 18 percent of the urban black labour force, and less than 6 percent of rural black workers, possessed a grade 8 education (Griffiths and Jones, 1980, p. 188; Knight and McGrath, 1977, p. 248). The high dropout rate of black children results from the inability of their parents to continue to support them. Even for those blacks who do manage to stay in school, the benefits are not as great as those enjoyed by their white counterparts:

"Bantu education" is notorious for its low quality, high pupil-teacher ratios, overcrowded classrooms, poorly
qualified teachers not fluent in the medium of instruction, and rote learning (Knight and McGrath, 1977, p. 260).

Thus the set of discriminatory expenditure priorities applied by the South African government to education and other public services constitutes one of the most powerful instruments of apartheid policy.
Maximization of the profit function in equation 3 (chapter 4) yields the following first-order conditions:

\[(A1) \quad \bar{Q} = \bar{Q}(P_x, P_g, W_u, W_s, T_a, T_c)\]
\[(A2) \quad \bar{X} = \bar{X}(P_x, P_g, W_u, W_s, T_a, T_c)\]
\[(A3) \quad \bar{G} = \bar{G}(P_x, P_g, W_u, W_s, T_a, T_c)\]
\[(A4) \quad \bar{L}_u = \bar{L}_u(P_x, P_g, W_u, W_s, T_a, T_c)\]
\[(A5) \quad \bar{L}_b = \bar{L}_b(P_x, P_g, W_u, W_s, T_a, T_c)\]
\[(A6) \quad \bar{L}_w = \bar{L}_w(P_x, P_g, W_u, W_s, T_a, T_c)\]

Using the envelope theorem (Varian, 1979, p. 268) we can calculate the following partial derivatives:

\[(A7) \quad \bar{Q}1 = (1 - T_c) \cdot X(\bar{L}_u, \bar{L}_b, \bar{L}_w) > 0\]
\[(A8) \quad \bar{Q}2 = (1 - T_c) \cdot G(\bar{L}_u, \bar{L}_b, \bar{L}_w) > 0\]
(A9) \( \bar{Q}3 = -(1 - Ta) \cdot (Lux + Lug) < 0 \)

(A10) \( \bar{Q}4 = -(Lbx + Lwx + Lbg + Lwg) < 0 \)

(A11) \( \bar{Q}5 = -Wu \cdot (Lux + Lug) < 0 \)

(A12) \( \bar{Q}6 = -Px \cdot X(Lux, Lbx, Lwx) - Pg \cdot G(Lug, Lbg, Lwg) < 0 \)

Applying a lemma of the envelope theorem (Roy's identity) we can also calculate:

\[
\begin{align*}
\bar{L}u1 &= -\frac{2}{d \frac{Q(Lu(Px), Px)}{dLu} dPx} \\
&= -(1 - Tc) \cdot \frac{x1}{(1 - Tc) \cdot (Px \cdot X11 + Pg \cdot G11)} \\
&= -\frac{x1}{(Px \cdot X11 + Pg \cdot G11)} > 0
\end{align*}
\]

(since \( X11 < 0, G11 < 0 \))

(A14) \( \bar{L}u2 = -(1 - Tc) \cdot G1/(1 - Tc) \cdot (Px \cdot X11 + Pg \cdot G11) \)

\( = -\frac{G1}{(Px \cdot X11 + Pg \cdot G11)} > 0 \)
\[(A15) \quad \overline{\mu}_3 = \frac{(1 + T_a)}{(1 - T_c)} \cdot (P_x \cdot X_{11} + P_g \cdot G_{11}) < 0 \]

\[
d\left\{ (1 - T_c) \cdot P_x \cdot X_1 + (1 - T_c) \cdot P_g \cdot G_1 \right\} - (1 + T_a) \cdot \mu_u \right\} / d\mu_u \\
\quad \frac{\left(1 - T_c\right) \cdot (P_x \cdot X_{11} + P_g \cdot G_{11})}{(A16) \quad \overline{\mu}_4 = \frac{(1 + T_a)}{(1 - T_c)} \cdot (P_x \cdot X_{11} + P_g \cdot G_{11}) < 0} \]

\[(A17) \quad \overline{\mu}_5 = \frac{\mu_u}{(1 - T_c) \cdot (P_x \cdot X_{11} + P_g \cdot G_{11})} < 0 \]

\[(A18) \quad \overline{\mu}_6 = \frac{(P_x \cdot X_1 + P_g \cdot G_1)}{(1 - T_c) \cdot (P_x \cdot X_{11} + P_g \cdot G_{11})} < 0 \]

Similarly:

\[(A19) \quad \overline{b}_1 = -\frac{X_2}{P_x \cdot X_{22} + P_g \cdot G_{22}} > 0 \]

\[
\quad \text{(since } X_{22} < 0, G_{22} < 0) \]

\[(A20) \quad \overline{b}_2 = -\frac{G_2}{P_x \cdot X_{22} + P_g \cdot G_{22}} > 0 \]

\[(A21) \quad \overline{b}_3 = 0 \]

\[(A22) \quad \overline{b}_4 = \frac{1}{(1 - T_c) \cdot (P_x \cdot X_{22} + P_g \cdot G_{22})} < 0 \]

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(A23) \( \bar{L}_{b5} = 0 \)

(A24) \( \bar{L}_{b6} = \frac{P_x X_2 + P_g G_2}{(1 - T_c)(P_x X_2 + P_g G_2)} < 0 \)

And:

(A25) \( \bar{L}_{w1} = -\frac{X_3}{(P_x X_3 + P_g G_3)} > 0 \)

(since \( X_3 < 0, G_3 < 0 \))

(A26) \( \bar{L}_{w2} = -\frac{G_3}{(P_x X_3 + P_g G_3)} > 0 \)

(A27) \( \bar{L}_{w3} = 0 \)

(A28) \( \bar{L}_{w4} = \frac{1}{(1 - T_c)(P_x X_3 + P_g G_3)} < 0 \)

(A29) \( \bar{L}_{w5} = 0 \)

(A30) \( \bar{L}_{w6} = \frac{P_x X_3 + P_g G_3}{(1 - T_c)(P_x X_3 + P_g G_3)} < 0 \)

Noting that

\[ \bar{x}_i = x_1 \bar{L}_{ui} + x_2 \bar{L}_{bi} + x_3 \bar{L}_{wi} \quad (i = 1, \ldots, 6), \]

we obtain the following:
\( \ddot{x}_1 = - \frac{x_1}{(P_{x,x11} + P_{g,G11})} - \frac{x_2}{(P_{x,x22} + P_{g,G22})} - \frac{x_3}{(P_{x,x33} + P_{g,G33})} > 0 \)

\( \ddot{x}_2 = - \frac{x_1 \cdot G_1}{P_{x,x11} + P_{g,G11}} - \frac{x_2 \cdot G_2}{P_{x,x22} + P_{g,G22}} - \frac{x_3 \cdot G_3}{P_{x,x33} + P_{g,G33}} > 0 \)

\( \ddot{x}_3 = \frac{x_1 \cdot (1 + T_a)}{(1 - T_c) \cdot (P_{x,x11} + P_{g,G11})} < 0 \)

\( \ddot{x}_4 = \frac{x_2}{(1 - T_c) \cdot (P_{x,x22} + P_{g,G22})} + \frac{x_3}{(1 - T_c) \cdot (P_{x,x33} + P_{g,G33})} < 0 \)

\( \ddot{x}_5 = \frac{x_1 \cdot W_u}{(1 - T_c) \cdot (P_{x,x11} + P_{g,G11})} < 0 \)

\( \ddot{x}_6 = \frac{x_1 \cdot (P_{x,x1} + P_{g,G1})}{(1 - T_c) \cdot (P_{x,x11} + P_{g,G11})} + \frac{x_2 \cdot (P_{x,x2} + P_{g,G2})}{(1 - T_c) \cdot (P_{x,x22} + P_{g,G22})} + \frac{x_3 \cdot (P_{x,x3} + P_{g,G3})}{(1 - T_c) \cdot (P_{x,x33} + P_{g,G33})} < 0 \)

Similarly:

\( \ddot{G}_1 = G_1 \cdot \ddot{Lu}_1 + G_2 \cdot \ddot{Lb}_1 + G_3 \cdot \ddot{Lw}_1 > 0 \)
The constrained utility maximization problem facing white skilled workers is defined in equation 4 (chapter 4). The resulting first-order conditions produce the following reduced form expressions:

\[(A38) \quad \bar{G}_2 = G_1 \bar{L}_u + G_2 \bar{L}_b + G_3 \bar{L}_w > 0\]
\[(A39) \quad \bar{G}_3 = G_1 \bar{L}_u + G_2 \bar{L}_b + G_3 \bar{L}_w < 0\]
\[(A40) \quad \bar{G}_4 = G_1 \bar{L}_u + G_2 \bar{L}_b + G_3 \bar{L}_w < 0\]
\[(A41) \quad \bar{G}_5 = G_1 \bar{L}_u + G_2 \bar{L}_b + G_3 \bar{L}_w < 0\]
\[(A42) \quad \bar{G}_6 = G_1 \bar{L}_u + G_2 \bar{L}_b + G_3 \bar{L}_w < 0\]

Using Roy's identity we obtain the following partial derivatives (where \( \text{M1} \) represents the Lagrangean multiplier):

\[(A43) \quad \bar{U}_w = \bar{U}_w(P_x, W_s, T_w)\]
\[(A44) \quad \bar{X}_w = \bar{X}_w(P_x, W_s, T_w)\]
\[(A45) \quad \bar{L}_w = \bar{L}_w(P_x, W_s, T_w)\]
(A46) \( \bar{x}_{w1} = m_1/u_{w11} < 0 \)  (since \( u_{w11} < 0 \))

(A47) \( \bar{x}_{w2} = 0 \)

(A48) \( \bar{x}_{w3} = 0 \)

(A49) \( \bar{l}_{w1} = 0 \)

(A50) \( \bar{l}_{w2} = -m_1(1 - t_w)/u_{w22} < 0 \)

(since \( u_{w22} > 0 \), by the assumption of diminishing marginal utility of leisure)

(A51) \( \bar{l}_{w3} = m_1w_s/u_{w22} > 0 \)

Furthermore, since

\[ \bar{u}_{wi} = u_{w1}\bar{x}_{wi} + u_{w2}\bar{l}_{wi} \quad (i = 1, 2), \]

we may derive the following:

(A52) \( \bar{u}_{w1} = u_{w1}m_1/u_{w11} < 0 \)
\[ (A53) \quad \bar{u}_w^2 = - Uw2.M1,(1 - Tw)/Uw22 > 0 \]

\[ (A54) \quad \bar{u}_w^3 = Uw2.M1.Ws/Uw22 < 0 \]

Solving the maximization problem for black skilled workers in equation 5 (chapter 4) results in the following first-order conditions:

\[ (A55) \quad \bar{u}_b = \bar{u}_b(Px, Ws, Lbo, Tb) \]

\[ (A56) \quad \bar{x}_b = \bar{x}_b(Px, Ws, Lbo, Tb) \]
\[ = Ws.Lbo.(1 - Tb)/Px \]

Differentiating these expressions we obtain:

\[ (A57) \quad \bar{x}_b^1 = - Ws.Lbo.(1 - Tb)/Px < 0 \]
\[ (A58) \quad \bar{x}_b^2 = \frac{L_{bo}}{P_x} \cdot (1 - T_b) > 0 \]

\[ (A59) \quad \bar{x}_b^3 = \frac{W_s}{P_x} \cdot (1 - T_b) > 0 \]

\[ (A60) \quad \bar{x}_b^4 = - W_s \cdot L_{bo}/P_x < 0 \]

\[ (A61) \quad \bar{u}_b^1 = \frac{U_b}{P_x} \cdot \bar{x}_b^1 < 0 \]

\[ (A62) \quad \bar{u}_b^2 = \frac{U_b}{P_x} \cdot \bar{x}_b^2 > 0 \]

\[ (A63) \quad \bar{u}_b^3 = \frac{U_b}{P_x} \cdot \bar{x}_b^3 + \frac{U_b}{P_x} > 0 \]

(if we assume that the marginal utility of the additional income generated by additional hours of work exceeds the marginal disutility of that work)

\[ (A64) \quad \bar{u}_b^4 = \frac{U_b}{P_x} \cdot \bar{x}_b^4 < 0 \]

Solving the maximization problem for black unskilled workers in equation 6 (chapter 4) we obtain the following first-order conditions:

\[ (A65) \quad \bar{u}_u = \bar{u}_u(P_x, P_g, W_u, W_s, T_a, T_c, T_b) \]
\[ (A66) \quad \bar{\bar{\mu}} = \bar{\bar{\mu}}(P_x, P_g, W_u, W_s, T_a, T_c, T_b) \]

\[ = (1 - T_b).W_u.\bar{\bar{\mu}}(P_x, P_g, W_u, W_s, T_a, T_c)/P_x \]

We can then evaluate the following partial derivatives:

\[ (A67) \quad \bar{\bar{\mu}}_1 = - (1 - T_b).W_u.\bar{\bar{\mu}}(\cdot)/P_x + (1 - T_b).W_u.\bar{\bar{\mu}}_1/P_x < 0 \]

(if we assume that the substitution effect of a price increase, perceived by black unskilled workers, is greater than the income effect which results from increased employment)

\[ (A68) \quad \bar{\bar{\mu}}_2 = (1 - T_b).W_u.\bar{\bar{\mu}}_2/P_x > 0 \]

\[ (A69) \quad \bar{\bar{\mu}}_3 = (1 - T_b).\{\bar{\bar{\mu}}(\cdot) + W_u.\bar{\bar{\mu}}_3\}/P_x > 0 \]

(if we assume that the positive income effect of an increase in the unskilled wage rate exceeds the negative employment effect)
Therefore follows that:

(A70) $\overline{xu}_{4} = (1 - T_{b}) \overline{w_{2}} \overline{lu}_{4} / P_{x} = 0$

(A71) $\overline{xu}_{5} = (1 - T_{b}) \overline{w_{2}} \overline{lu}_{5} / P_{x} < 0$

(A72) $\overline{xu}_{6} = (1 - T_{b}) \overline{w_{2}} \overline{lu}_{6} / P_{x} < 0$

(A73) $\overline{xu}_{7} = - \overline{w_{2}} \overline{lu}_{7} / P_{x} < 0$

It therefore follows that:

(A74) $\overline{uu}_{1} = \overline{u}_{2} \overline{uu}_{1} < 0$

(A75) $\overline{uu}_{2} = \overline{u}_{2} \overline{uu}_{2} > 0$

(A76) $\overline{uu}_{3} = \overline{u}_{2} \overline{uu}_{3} > 0$

(A77) $\overline{uu}_{4} = \overline{u}_{2} \overline{uu}_{4} = 0$

(A78) $\overline{uu}_{5} = \overline{u}_{2} \overline{uu}_{5} < 0$

(A79) $\overline{uu}_{6} = \overline{u}_{2} \overline{uu}_{6} < 0$

(A80) $\overline{uu}_{7} = \overline{u}_{2} \overline{uu}_{7} < 0$

Invoking the market clearing conditions given by equations 7 and 8, we obtain the following reduced form expressions:
(A81) \[ \bar{X}^* = \bar{X}'(Pg, Wu, Lbo, Ta, Tc, Tw, Tb) \]

(A82) \[ \bar{C}^* = \bar{G}'(Pg, Wu, Lbo, Ta, Tc, Tw, Tb) \]

(A83) \[ \bar{P}_x = \bar{P}_x(Pg, Wu, Lbo, Ta, Tc, Tw, Tb) \]

(A84) \[ \bar{W}_s = \bar{W}_s(Pg, Wu, Lbo, Ta, Tc, Tw, Tb) \]

In order to evaluate the partial derivatives of the price of \( X \) and the skilled wage rate with respect to the exogenous variables, we totally differentiate equations 7 and 8 (chapter 4). We then define the following Jacobian:

\[
\begin{vmatrix}
\bar{x}_1 - \bar{x}_{11} & \bar{x}_4 - \bar{x}_{12} \\
- \bar{x}_{b1} - \bar{x}_{u1} & - \bar{x}_{b2} - \bar{x}_{u4} \\
\bar{L}_w d_1 + \bar{L}_b d_1 & \bar{L}_w d_4 + \bar{L}_b d_4 \\
- \bar{L}_w & - \bar{L}_w
\end{vmatrix}
\]

(A85) \[ J = \]

In the analysis that follows we will assume that \( |J| < 0 \). The necessity for imposing such an arbitrary restriction upon the sign of this determinant derives from the fact that no initial assumptions were made regarding relative factor intensities in
the two industries and the degree of substitutability between factors (see footnote 18, chapter 4). Applying Cramer's rule we may now calculate:

\[
\begin{vmatrix}
-\bar{x}_2 + \bar{x}_u2 & \bar{x}_4 - \bar{x}_w2 \\
-\bar{x}_b2 - \bar{x}_u2 & \\
-\bar{L}_{wd2} - \bar{L}_{bd2} & \bar{L}_{wd4} + \bar{L}_{bd4} \\
\end{vmatrix}
\]

\[
\frac{dP_x}{dP_g} = \frac{-\bar{L}_w2}{\boxed{1}} > 0
\]

if we assume that

\[
\bar{x}_2 = \bar{x}_u2 ,
\]

which means that there is a zero net output effect of a change in the gold price. For example, the additional output of \(X\) produced as a result of a rise in \(P_g\) is consumed by black workers (i.e. the value marginal product of unskilled workers is equal to their wage). Similarly:
The latter assumption means that the negative effect on output of the apartheid premium \((Ta)\) is greater than its negative effect on black unskilled workers' consumption. Using the same method, we may also evaluate the following:
\( \frac{dF_x}{dT_c} < 0 \)
assuming that \( x_6 > \bar{x}_6 \)

\( \frac{d\bar{w}_s}{dT_c} < 0 \)
assuming that \( \bar{x}_6 > \bar{x}_u \)

\( \frac{dF_x}{dT_w} < 0 \)

\( \frac{d\bar{w}_s}{dT_w} < 0 \)

\( \frac{dF_x}{dT_b} < 0 \)

\( \frac{d\bar{w}_s}{dT_b} < 0 \)

We obtain equation A81 by substituting equations A83 and A84 into equation A2. Similarly, we obtain equation A82 by substituting equations A83 and A84 into equation A3. In a similar manner, we can obtain "true" reduced form expressions for:

\[ \bar{Q}, \bar{L}_u, \bar{L}_w, \bar{U}_w, \bar{U}_b, \bar{U}_u \]

In order to evaluate the signs of the partial derivatives of these reduced form functions, however, it is necessary to make some assumptions regarding the relative magnitudes of direct and
indirect effects of changes in exogenous variables on the endogenous variables. It is also necessary to make certain assumptions about the relative dominance of changes in $P_X$ vis-a-vis changes in $W_s$. In almost all cases we will assume, first, that direct effects always outweigh indirect effects, and second, that the effect of a change in the skilled wage rate outweighs the effect of a change in the price of consumption goods. These assumptions are admittedly arbitrary, but it is necessary to impose some restrictions on the general equilibrium structure of the model in order to arrive at qualitative results.

Substituting equations A93 and A84 into equation A1:

$$(A1') \quad \tilde{Q} = \tilde{Q}(\tilde{P}_X, P_g, W_u, \tilde{W}_s, \tau_a, \tau_c)$$

In other words, we obtain a "true" reduced form profit function:

$$(A100) \quad \tilde{Q}' = \tilde{Q}'(P_g, W_u, L_{bo}, \tau_a, \tau_c, \tau_w, \tau_b)$$

Invoking the assumptions described above, regarding the relative magnitudes of direct and indirect effects, and wage and price effects, we may evaluate the following partial derivatives of the profit function given in equation A100:
\( Q^*1 = \ddot{Q}2 + \ddot{Q}1 \cdot (d\dddot{p}_x/d\rho_g) + \ddot{Q}4 \cdot (d\dddot{w}_s/d\rho_g) > 0 \)

\( Q^*2 = \ddot{Q}3 + \ddot{Q}1 \cdot (d\dddot{p}_x/d\rho_w) + \ddot{Q}4 \cdot (d\dddot{w}_s/d\rho_w) < 0 \)

\( Q^*3 = \ddot{Q}1 \cdot (d\dddot{p}_x/d\rho_{bo}) + \ddot{Q}4 \cdot (d\dddot{w}_s/d\rho_{bo}) > 0 \)

\( Q^*4 = \ddot{Q}5 + \ddot{Q}1 \cdot (d\dddot{p}_x/d\rho_{a}) + \ddot{Q}4 \cdot (d\dddot{w}_s/d\rho_{a}) < 0 \)

\( Q^*5 = \ddot{Q}6 + \ddot{Q}1 \cdot (d\dddot{p}_x/d\rho_{c}) + \ddot{Q}4 \cdot (d\dddot{w}_s/d\rho_{c}) < 0 \)

\( Q^*6 = \ddot{Q}1 \cdot (d\dddot{p}_x/d\rho_{w}) + \ddot{Q}4 \cdot (d\dddot{w}_s/d\rho_{w}) > 0 \)

\( Q^*7 = \ddot{Q}1 \cdot (d\dddot{p}_x/d\rho_{b}) + \ddot{Q}4 \cdot (d\dddot{w}_s/d\rho_{b}) > 0 \)

Similarly:

\( x^*1 > 0 \)

\( x^*2 < 0 \)

\( x^*3 > 0 \)

\( x^*4 < 0 \)

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Substituting equations A83 and A84 into the white labour supply function (equation A45), we obtain:

\[(A45') \quad \bar{L}w = \bar{L}w(Px(\cdot), \bar{W}s(\cdot), Tw)\]

We may thus derive a "true" reduced form expression for white skilled labour supply:
Again, invoking the assumptions described above, we may evaluate the following partial derivatives:

\[(A122) \quad \tilde{L}w' = \tilde{L}w'(Pg, Wu, Lbo, Ta, Tc, Tw, Tb)\]

\[(A123) \quad \tilde{L}w'1 = \tilde{L}w1.(d\tilde{P}/dpq) + \tilde{L}w2.(d\tilde{W}/dpq) < 0\]

\[(A124) \quad \tilde{L}w'2 = \tilde{L}w1.(d\tilde{P}/dWu) + \tilde{L}w2.(d\tilde{W}/dWu) < 0\]

\[(A125) \quad \tilde{L}w'3 = \tilde{L}w1.(d\tilde{P}/dLbo) + \tilde{L}w2.(d\tilde{W}/dLbo) > 0\]

\[(A126) \quad \tilde{L}w'4 = \tilde{L}w1.(d\tilde{P}/dTa) + \tilde{L}w2.(d\tilde{W}/dTa) < 0\]

\[(A127) \quad \tilde{L}w'5 = \tilde{L}w1.(d\tilde{P}/dTc) + \tilde{L}w2.(d\tilde{W}/dTc) > 0\]

\[(A128) \quad \tilde{L}w'6 = \tilde{L}w3 + \tilde{L}w1.(d\tilde{P}/dTw) + \tilde{L}w2.(d\tilde{W}/dTw) > 0\]

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In an analogous manner we may calculate the signs of the partial
derivatives of the "true" reduced form unskilled labour supply
function and the utility functions of black and white workers:

\[(A129) \quad \tilde{w}_7 = \tilde{w}_1 \cdot (d\tilde{p}_x/d\tilde{t}_b) + \tilde{w}_2 \cdot (d\tilde{w}_s/d\tilde{t}_b) > 0\]

Solving the constrained maximization problem faced by the ruling
group in equation 10 (chapter 4) results in the first-order
conditions listed in equations 11 to 15. Using Roy's identity,
we may evaluate the signs of the partial derivatives of these
reduced form functions. However, it will again be necessary, in
some cases, to impose restrictions on the relative magnitudes of
various cross-effects in order to obtain determinate qualitative
results:
\[
\begin{align*}
\text{(A134) } \quad L_{bo^*1} &= - \frac{2}{dZ(\cdot)/dL_{bo^*}} \frac{2}{dZ(\cdot)/dL_{bo^*}} \\
&= - \frac{dZ(\cdot)/dL_{bo^*}}{dZ(\cdot)/dL_{bo^*}} < 0 \\
\tilde{u}_{w^*3} - \tilde{q}_{s^*3} &= - \frac{2}{dZ(\cdot)/dL_{bo^*}} \frac{2}{dZ(\cdot)/dL_{bo^*}} < 0
\end{align*}
\]

where

\[
Z = a.\tilde{u}_{w^*}(\cdot) + (1 - a) .\tilde{q}_{s^*}(\cdot) + M_2 \{ T_c.P_x(\cdot).X^*(\cdot) \\
+ T_c.P_g.\tilde{c}^*(\cdot) + T_w.\tilde{l}_{w^*}(\cdot).\tilde{w}_s(\cdot) + T_h.\tilde{u}_{u^*}(\cdot).\tilde{u}_u \\
+ T_h.L_{bo^*}.\tilde{w}_s(\cdot) - C(\tilde{u}_{b^*}(\cdot), \tilde{u}_{u^*}(\cdot), D)\}
\]

where \(M_2\) is the Lagrangean multiplier and
\[ E = \frac{dZ(\cdot)}{dLbo} \]
\[ = a_{\bar{u}}w_{b}3 + (1 - a)_{\bar{G}}3 + M2_{\cdot}(\bar{Tc}_{\cdot}\bar{Px}(\cdot)_{\bar{X}}3 + Tc_{\cdot}\bar{X}(\cdot)_{\bar{P}x3} + Tc_{\cdot}P_g_{\cdot}\bar{G}3 + Tw_{\cdot}L_{W}(\cdot)_{\bar{W}s3} + T_{\cdot}W_{\cdot}s(\cdot)_{\bar{L}w3} + T_{\cdot}W_{\cdot}u_{\cdot}L_{\cdot}u3 + T_{\cdot}L_{\cdot}b_{\cdot}W_{\cdot}s3 - C1(\cdot)_{\bar{U}b_{\cdot}3} - C2(\cdot)_{\bar{U}u_{\cdot}3} \]
if we assume that

\[ T_c \overline{X}_3 \overline{P} x_1 + T_c \overline{P} x_3 \overline{X}_1 + T_w \overline{W}_3 \overline{L} w_1 + T_w \overline{L} w_3 \overline{W}_1 > 0, \]

which is not an unreasonable assumption since all of these terms are positive except for the second one.

\[
\frac{2}{dZ(\cdot)/dLbo \cdot dWu}
\]

(A136) \[ Lbo \cdot 3 = - \frac{2}{dZ(\cdot)/dLbo} \]

\[
\frac{dE/dWu}{2} = - \frac{2}{dZ(\cdot)/dLbo} > 0
\]

if we assume that
which is again not an unreasonable assumption since only the first of these terms is negative.

\[ \frac{2}{d} Z(\cdot)/dLbo \cdot dD \]

\[ (A137) \quad Lbo^*4 = - \frac{\frac{2}{d} Z(\cdot)}{dZ(\cdot)/dLbo} \]

\[ = - \frac{\frac{2}{d} Z(\cdot)}{dZ(\cdot)/dLbo} \]

\[ \frac{dE}{dD} = - \frac{\frac{2}{d} Z(\cdot)}{dZ(\cdot)/dLbo} \]
\[
\mathbf{M}_2 ( - \bar{\mathbf{u}} b^* \mathbf{3} c^1 - \bar{\mathbf{u}} u^* \mathbf{3} c^2 )
\]
\[
\geq \frac{d^2 \mathbf{Z} (\cdot) / d\mathbf{Ib}^*}{2 d \mathbf{Z} (\cdot) / d\mathbf{Ib}^*}
\]

\[
\frac{d^2 \mathbf{Z} (\cdot) / d\mathbf{Ta}^* \cdot \mathbf{a}}{2 d \mathbf{Z} (\cdot) / d\mathbf{Ta}}
\]

(A139) \[
\mathbf{T} \mathbf{a}^* \mathbf{1} = \frac{d\mathbf{F} / d\mathbf{a}}{2 d \mathbf{Z} (\cdot) / d\mathbf{Ta}}
\]

\[
= \frac{d\mathbf{F} / d\mathbf{a}}{2 d \mathbf{Z} (\cdot) / d\mathbf{Ta}}
\]

\[
= \frac{d\mathbf{F} / d\mathbf{a}}{2 d \mathbf{Z} (\cdot) / d\mathbf{Ta}}
\]

\[
= \frac{d\mathbf{F} / d\mathbf{a}}{2 d \mathbf{Z} (\cdot) / d\mathbf{Ta}}
\]

where

\[
\mathbf{F} = \frac{d\mathbf{Z} (\cdot) / d\mathbf{Ta}}{2 d \mathbf{Z} (\cdot) / d\mathbf{Ta}}
\]

\[
= a \cdot \bar{\mathbf{u}} w^* \mathbf{4} + (1 - a) \cdot q^* \mathbf{4} + \mathbf{M}_2 (\mathbf{Tc} \cdot \mathbf{P} \mathbf{x} (\cdot) \cdot \bar{x}^* \mathbf{4})
\]
\[ + \text{TC} \cdot \overline{x} \cdot \overline{p} \cdot x + \text{TC} \cdot \overline{p} \cdot \overline{c} \cdot u + \text{TW} \cdot \overline{l} \cdot \overline{w} \cdot \overline{s} \cdot \overline{u} \cdot 4 + \text{TW} \cdot \overline{w} \cdot \overline{s} \cdot (.) \cdot \overline{w} \cdot 4 + \text{Tb} \cdot \overline{w} \cdot \overline{w} \cdot \overline{u} \cdot 4 + \text{Tb} \cdot \overline{l} \cdot \overline{b} \cdot \overline{w} \cdot \overline{w} \cdot 4 - \text{C1} \cdot (. \cdot \overline{u} \cdot 4 - \text{C2} \cdot (. \cdot \overline{b} \cdot 4) \}

Similarly:

\[
\frac{\partial^2}{\partial z (.) / \partial \text{Ta} \cdot \partial p} \\
(\text{A139}) \quad \text{Ta}^2 = \frac{2}{2} \\
\frac{\partial f}{\partial p} = \frac{2}{2} < 0 \\
\frac{\partial z (.) / \partial \text{Ta}}

if we assume that

\[
\text{TC} \cdot \overline{x} \cdot 4 \cdot \overline{p} \cdot x + \text{TC} \cdot \overline{p} \cdot x \cdot \overline{x} \cdot 1 + \text{TW} \cdot \overline{w} \cdot 4 \cdot \overline{w} \cdot 1 + \text{TW} \cdot \overline{w} \cdot 4 \cdot \overline{w} \cdot 1 \cdot 4 \cdot \overline{w} \cdot 1 < 0
\]
2 \frac{d Z(\cdot)/dT_{a,w}}{d^{2}} 

(A140) \quad T_{a} = 3 = - \frac{d^{2}}{d^{2} Z(\cdot)/dT_{a,w}} < 0 

\frac{dF/dW_{w}}{d^{2}} = - \frac{d^{2}}{d^{2} Z(\cdot)/dT_{a,w}} < 0 

2 \frac{d Z(\cdot)/dT_{a,w,d}}{d^{2}} 

(A141) \quad T_{a} = 4 = - \frac{d^{2}}{d^{2} Z(\cdot)/dT_{a,w}} < 0 

\frac{dF/dD_{D}}{d^{2}} = - \frac{d^{2}}{d^{2} Z(\cdot)/dT_{a,w}} < 0 

\frac{M_{2}.(- \bar{u}_{b}^{u}c_{13} - \bar{u}_{u}^{u}c_{23})}{d^{2} Z(\cdot)/dT_{a,w}} < 0 

if we assume that the marginal disutility to black unskilled workers exceeds, in absolute terms, the marginal utility to black skilled workers. This does not seem to be an unreasonable assumption, since black unskilled workers numerically dominate black skilled workers, so that their disutility is likely to
carry greater weight.

\[
\begin{align*}
Tc^1 &= -\frac{2}{d Z(\cdot)/dTc}.da \\
(A142)
\end{align*}
\]

if the marginal disutility of a rise in \( Tc \) has a greater absolute value for capitalists than for white workers, and where

\[
H = \frac{dZ(\cdot)/dTc}{2} \frac{dH/da}{dZ(\cdot)/dTc}
\]

\[
= a.\overline{w}5 + (1 - a).\overline{Q}5 + M2.\{Tc,Fx(\cdot).\bar{x}\}.5
\]
\[ + Tc \cdot \bar{X} (\cdot), \bar{P} x 5 + \bar{P} x (\cdot), \bar{X} (\cdot) + Tc \cdot P g \cdot \bar{G} \cdot 5 \]

\[ + P g \cdot \bar{G} (\cdot) + Tw \cdot \bar{I} w (\cdot) \cdot \bar{W} s 5 + Tw \cdot \bar{W} s (\cdot) \cdot \bar{I} w \cdot 5 \]

\[ + T b \cdot W u \cdot \bar{I} u \cdot 5 + T b \cdot L b o \cdot \bar{W} s 5 - C 1 (\cdot) \cdot \bar{U} b \cdot 5 \]

\[ - C 2 (\cdot) \cdot \bar{U} u \cdot 5 \}

Similarly:

\[ \frac{d^2 Z (\cdot)}{dTc \cdot dPg} \]

(A143) \[ Tc^2 = - \frac{\frac{d^2 Z (\cdot)}{dTc}}{2} \]

\[ \frac{dH}{dPg} \]

\[ = - \frac{\frac{d^2 Z (\cdot)}{dTc}}{2} < 0 \]
\[
\begin{align*}
\text{A144) } & \quad Tc'3 = - \frac{d z(\ast)/dTc \cdot dWu}{2}\frac{d H/dWu}{2} > 0 \\
\text{A145) } & \quad Tc'4 = - \frac{d z(\ast)/dTc \cdot dD}{2}\frac{d H/dD}{2} < 0
\end{align*}
\]

\[
= \frac{-M2 \cdot (-\bar{\Omega}b^{5.0} C13 - \bar{\Omega}u^{5.0} C23)}{d z(\ast)/dTc} < 0
\]
\[
\begin{align*}
(\text{A146}) \quad T_w^1 &= - \frac{\frac{2}{\frac{\partial Z(\cdot)/\partial T_w}{\partial T_w}}}{\frac{\partial Z(\cdot)/\partial T_w}{\partial T_w}} \\
&= - \frac{\frac{\partial K}{\partial a}}{\frac{\partial Z(\cdot)/\partial T_w}{\partial T_w}} \\
&= - \frac{\bar{U}w^*6 - \bar{Q}^*6}{\frac{\partial Z(\cdot)/\partial T_w}{\partial T_w}} < 0
\end{align*}
\]

where

\[
K = \frac{\partial Z(\cdot)/\partial T_w}{\partial T_w} = a \cdot \bar{U}w^*6 + (1 - a) \cdot \bar{Q}^*6 + M_2 \cdot (Tc \cdot Px(\cdot) \cdot \bar{R}^*6)
\]
\[ + Tc, X^6(\cdot), Px6 + Tc, Pg, G^6 + Tw, Lw^6(\cdot), Ws6 \\
+ Tw, Ws(\cdot), Lw^6 + Lw^6(\cdot), Ws(\cdot) + Tb, Wu, Lu^6 \\
+ Tb, Lbo, Ws6 - C1(\cdot), Ub^6 - C2(\cdot), Vu^6 \] 

Similarly:

\[
(A147) \quad Tw^2 = - \frac{\frac{dK}{dpg}}{2^2} > 0 \\
\quad \frac{dZ(\cdot)}{dtw} < 
\]

\[
(A148) \quad Tw^3 = - \frac{\frac{dK}{dwu}}{2^2} > 0 \\
\quad \frac{dZ(\cdot)}{dtw} < 
\]
\( (A149) \quad T_w^4 = \frac{dK/dD}{d \frac{Z(*)}{dTw}} \)

\[ = - \frac{M_2 (- \bar{\bar{u}}b^6*, c13 - \bar{\bar{u}}u^6*, c23)}{d \frac{Z(*)}{dTw}} > 0 \]

if we assume that the absolute magnitude of the marginal utility to black unskilled workers consequent upon a rise in \( T_w \) exceeds that of the marginal disutility to black skilled workers.

\( (A150) \quad T_b^1 = \frac{2}{d \frac{Z(*)}{dTb}} \)

\[ = - \frac{2}{d \frac{Z(*)}{dTb}} \]
\[
\frac{dW}{da} = - \frac{1}{2} \frac{dZ}{dTb} \frac{2}{2}
\]

\[
= - \frac{Uw'7 - Q'7}{2} > 0
\]
\[
\frac{dZ}{dTb}
\]

if we assume that the magnitude of the marginal utility to white workers associated with an increase in Tb exceeds that to employers. \(W\) is defined as follows:

\[
W = \frac{dZ}{dTb}
\]

\[
= aUw'7 + (1 - a)Q'7 + M2(TcPz(0)z'7
\]

\[
+ TcX'(0)px7 + TcPxTcPqG'7 + TwLw'(0)\bar{w}s7
\]

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if we assume that

\[ + Tw.\bar{W}7.\bar{L} + Th.Wu.\bar{L} + \bar{L}.{Wu} \]

\[ + Th.Lbo.\bar{W} + Lbo.\bar{W} - C1.(.)\bar{U} \]

\[-C2.(.)\bar{U} \]

Similarly:

\[ \frac{dN/dPg}{2 - \frac{2}{dZ(\cdot)/dTb}} > 0 \]

if we assume that

\[ Tc.\bar{X}7.Px1 + Tc.\bar{P}x7.\bar{X} + Tw.\bar{W}7.\bar{L} \]

\[ + Tw.\bar{L}7.\bar{W} + Wu.\bar{L} + Lbo.\bar{W} > 0 \]

And:

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\[(A152) \quad T_4^3 = - \frac{dN/d\mu}{d Z(\cdot)/dT} > 0\]

if we assume that

\[Tc.\bar{x}7.\bar{p}x^2 + Tc.\bar{p}x7.\bar{x}'^2 + Tw.\bar{w}s7.\bar{L}w7.2\]
\[+ Tw.\bar{L}w7.\bar{w}s2 + Wu.\bar{L}u7.2 + Lbo.\bar{w}s2 > 0\]

And:

\[(A153) \quad T_4^4 = - \frac{dN/d\theta}{d Z(\cdot)/dT} \]

\[= \frac{m2.(- \bar{u}b7.\bar{c}13 - \bar{u}u7.\bar{c}23)}{d Z(\cdot)/dT} < 0\]
### APPENDIX 4: DEFINITION AND DESCRIPTION OF THE DATA USED IN CHAPTER 5

#### (A4.1) Alphabetical List of Symbols and Definitions

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVRWNW</td>
<td>Average annual real wage rate of nonwhites employed in mining, manufacturing, construction, transportation and government, in constant (1953) Rands</td>
</tr>
<tr>
<td>AVRWUNS</td>
<td>Average annual real unskilled wage rate (wage rate of nonwhites employed in mining), in constant (1953) Rands</td>
</tr>
<tr>
<td>AVRWW</td>
<td>Annual average real wage rate of whites employed in mining, manufacturing, construction, transportation and government, in constant (1953) Rands</td>
</tr>
<tr>
<td>BAN</td>
<td>Number of banning orders in force against persons</td>
</tr>
<tr>
<td>BSECSCHS</td>
<td>Number of blacks enrolled in secondary school, per 1000 of the total black population</td>
</tr>
<tr>
<td>BSTRIKE</td>
<td>Number of black workers involved in strikes and work stoppages</td>
</tr>
<tr>
<td>BUNIVS</td>
<td>Number of students enrolled in black universities (Fort Hare, University of the North, Zululand and Medunsa), per 1000 of the total black population</td>
</tr>
<tr>
<td>CIBURS</td>
<td>Number of Indian and coloured adults placed in employment by labour bureaux, per 1000 of the Indian and coloured population</td>
</tr>
<tr>
<td>CITEACHS</td>
<td>Ratio of the number of coloureds and Indians enrolled in teachers' training colleges to the total coloured and Indian population</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer price index (all items), 1953 = 100</td>
</tr>
<tr>
<td>DEFS</td>
<td>Ratio of government defence expenditure (amount voted annually to defence budget from central government revenue account) to gross national product at market prices</td>
</tr>
<tr>
<td>DEFSP</td>
<td>Real per capita defence expenditure (amount voted annually to defence budget from central government revenue account), in constant (1953) Rands</td>
</tr>
<tr>
<td>DPT</td>
<td>Dummy variable for the Portuguese decolonization of 1974</td>
</tr>
<tr>
<td>DSO</td>
<td>Dummy variable for the Soweto riots of 1976</td>
</tr>
<tr>
<td>DST</td>
<td>Dummy variable for the Durban strikes of 1973</td>
</tr>
<tr>
<td>EMIG</td>
<td>Total number of emigrants leaving South Africa</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>IMMIG</td>
<td>Total number of immigrants arriving in South Africa</td>
</tr>
<tr>
<td>INT</td>
<td>Nominal rate of interest on long-term government stock</td>
</tr>
<tr>
<td>INTAXFIR</td>
<td>Average index of total taxes paid by manufacturing, mining and commercial enterprises, 1960-70 = 100</td>
</tr>
<tr>
<td>LNW</td>
<td>Total number of nonwhites employed in mining, manufacturing, construction, transportation and central government</td>
</tr>
<tr>
<td>LW</td>
<td>Total number of whites employed in mining, manufacturing, construction, transportation and central government</td>
</tr>
<tr>
<td>NWSUNIVS</td>
<td>Number of nonwhite students in all universities and university colleges, per 1000 of the total nonwhite population</td>
</tr>
<tr>
<td>PARTNW</td>
<td>Nonwhite participation rate (ratio of total nonwhite employment in mining, manufacturing, construction, transportation and government to total nonwhite population)</td>
</tr>
<tr>
<td>PARTW</td>
<td>White participation rate (ratio of total white employment in mining, manufacturing, construction, transportation and government to total white population)</td>
</tr>
<tr>
<td>PASLAW</td>
<td>Number of persons prosecuted for offences relating to reference books and influx control</td>
</tr>
<tr>
<td>PASLAWN</td>
<td>Number of persons prosecuted for offences relating to reference books and influx control, per 1000 of the black population</td>
</tr>
<tr>
<td>PCRGDP</td>
<td>Per capita real gross domestic product at factor incomes in constant (1970) Rands</td>
</tr>
<tr>
<td>PCRNNI</td>
<td>Per capita real net national income at factor prices, in constant (1953) Rands</td>
</tr>
<tr>
<td>RDEF</td>
<td>Amount voted annually to defence budget from central government revenue account, in thousands of constant (1953) Rands</td>
</tr>
<tr>
<td>RGDP</td>
<td>Real gross domestic product at factor incomes in millions of constant (1970) Rands</td>
</tr>
<tr>
<td>RGEWHOM</td>
<td>Total real expenditure by South African government institutions in the black homelands, in thousands of constant (1953) Rands</td>
</tr>
<tr>
<td>RGNP</td>
<td>Real gross national product at market prices in millions of constant (1953) Rands</td>
</tr>
<tr>
<td>RNNI</td>
<td>Real net national income at factor prices in millions of constant (1953) Rands</td>
</tr>
<tr>
<td>RNONWAGE</td>
<td>Real nonwage income in millions of constant (1953) Rands, defined as the contribution of gross operating surplus to gross domestic product at factor prices</td>
</tr>
<tr>
<td>RPGC</td>
<td>Real gold price in constant (1953) Rands per ounce, deflated by the consumer price index</td>
</tr>
</tbody>
</table>
### The Data

**RGMP: REAL GROSS NATIONAL PRODUCT AT MARKET PRICES IN MILLIONS OF CONSTANT (1953) RANDS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Values</th>
</tr>
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<tbody>
<tr>
<td>1960</td>
<td>4394.02</td>
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<tr>
<td>1961</td>
<td>5717.01</td>
</tr>
<tr>
<td>1962</td>
<td>6890.99</td>
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<td>1963</td>
<td>7508.46</td>
</tr>
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<td>1964</td>
<td>9699.02</td>
</tr>
<tr>
<td>1965</td>
<td>1046.4</td>
</tr>
<tr>
<td>1966</td>
<td>4275.8</td>
</tr>
</tbody>
</table>

**Source:** South African Reserve Bank, 1961-1982.
**RGDP: REAL GROSS DOMESTIC PRODUCT AT FACTOR INCOMES**

<table>
<thead>
<tr>
<th>Year</th>
<th>RGDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946</td>
<td>3651</td>
</tr>
<tr>
<td>1950</td>
<td>4434</td>
</tr>
<tr>
<td>1954</td>
<td>5347</td>
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<tr>
<td>1958</td>
<td>6218</td>
</tr>
<tr>
<td>1962</td>
<td>7383</td>
</tr>
<tr>
<td>1966</td>
<td>9448</td>
</tr>
<tr>
<td>1970</td>
<td>11839</td>
</tr>
<tr>
<td>1974</td>
<td>14116</td>
</tr>
</tbody>
</table>

**Source:** South Africa, Department of Statistics, 1978.

**RNMI: REAL NET NATIONAL INCOME AT FACTOR PRICES**

<table>
<thead>
<tr>
<th>Year</th>
<th>RNMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946</td>
<td>2080.34</td>
</tr>
<tr>
<td>1950</td>
<td>2685.99</td>
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<tr>
<td>1954</td>
<td>3067.78</td>
</tr>
<tr>
<td>1958</td>
<td>3328.95</td>
</tr>
<tr>
<td>1962</td>
<td>3983.47</td>
</tr>
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<td>1966</td>
<td>5178.46</td>
</tr>
<tr>
<td>1970</td>
<td>6651.92</td>
</tr>
<tr>
<td>1974</td>
<td>9135.22</td>
</tr>
<tr>
<td>1978</td>
<td>9017.43</td>
</tr>
</tbody>
</table>

**Source:** South Africa, Department of Statistics, 1978; South African Reserve Bank, 1961-1982.

**PCRGDP: PER CAPITA REAL GROSS DOMESTIC PRODUCT AT FACTOR INCOMES IN CONSTANT (1970) RANDS (**)**

<table>
<thead>
<tr>
<th>Year</th>
<th>PCRGDP</th>
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<tbody>
<tr>
<td>1946</td>
<td>287</td>
</tr>
<tr>
<td>1950</td>
<td>318</td>
</tr>
<tr>
<td>1954</td>
<td>349</td>
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<tr>
<td>1958</td>
<td>368</td>
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<tr>
<td>1962</td>
<td>396</td>
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<tr>
<td>1966</td>
<td>453</td>
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<td>1970</td>
<td>510</td>
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<tr>
<td>1974</td>
<td>548</td>
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</table>

**Source:** South Africa, Department of Statistics, 1978.
### PCNNRI: PER CAPITA REAL NET NATIONAL INCOME AT FACTOR PRICES IN CONSTANT (1953) RANDS (4)

<table>
<thead>
<tr>
<th>Year</th>
<th>PCNNRI</th>
<th>1950</th>
<th>1955</th>
<th>1960</th>
<th>1965</th>
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<tbody>
<tr>
<td>1946</td>
<td>181.689</td>
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<td>193.075</td>
<td>196.59</td>
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<td>1950</td>
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<td>212.41</td>
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<td>218.451</td>
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<td>223.649</td>
<td>221.509</td>
<td>228.25</td>
<td>228.502</td>
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<tr>
<td>1958</td>
<td>219.588</td>
<td>222.964</td>
<td>211.803</td>
<td>213.741</td>
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<td>1962</td>
<td>220.716</td>
<td>237.481</td>
<td>246.493</td>
<td>252.555</td>
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<td>1970</td>
<td>296.101</td>
<td>302.479</td>
<td>310.232</td>
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<tr>
<td>1974</td>
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<td>343.32</td>
<td>374.287</td>
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<tr>
<td>1978</td>
<td>377.393</td>
<td>398.612</td>
<td>459.45</td>
<td>433.764</td>
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### RNOWNGE: REAL NONWAGE INCOME IN MILLIONS OF CONSTANT (1953) RANDS, DEFINED AS THE CONTRIBUTION OF GROSS OPERATING SURPLUS TO GROSS DOMESTIC PRODUCT AT FACTOR PRICES

<table>
<thead>
<tr>
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<th>1955</th>
<th>1960</th>
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<td>1949</td>
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<td>1465.65</td>
<td>1456.32</td>
<td>1317.81</td>
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<tr>
<td>1953</td>
<td>1537.</td>
<td>1639.51</td>
<td>1644.76</td>
<td>1756.08</td>
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<tr>
<td>1957</td>
<td>1780.4</td>
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<td>1893.16</td>
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<tr>
<td>1961</td>
<td>1967.31</td>
<td>2076.03</td>
<td>2300.98</td>
<td>2435.61</td>
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<tr>
<td>1965</td>
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<td>2839.63</td>
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<tr>
<td>1969</td>
<td>3173.33</td>
<td>3154.35</td>
<td>3174.77</td>
<td>3451.76</td>
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<tr>
<td>1973</td>
<td>4150.39</td>
<td>4678.48</td>
<td>4325.28</td>
<td>4245.69</td>
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<tr>
<td>1977</td>
<td>4499.32</td>
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**Sources:** South Africa, Department of Statistics, 1978; South African Reserve Bank, 1961-1982.

### UNEMP: RATIO OF REGISTERED UNEMPLOYED TO TOTAL POPULATION (WHITES, COLOURED AND INDIANS) (5)

<table>
<thead>
<tr>
<th>Year</th>
<th>UNEMP</th>
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<th>1955</th>
<th>1960</th>
<th>1965</th>
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</thead>
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<td>0.003173</td>
<td>0.004338</td>
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<tr>
<td>1959</td>
<td>0.005553</td>
<td>0.005369</td>
<td>0.005887</td>
<td>0.005519</td>
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<tr>
<td>1963</td>
<td>0.003664</td>
<td>0.002671</td>
<td>0.002031</td>
<td>0.002293</td>
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<tr>
<td>1967</td>
<td>0.00229</td>
<td>0.002197</td>
<td>0.001705</td>
<td>0.001297</td>
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<tr>
<td>1971</td>
<td>0.001281</td>
<td>0.001781</td>
<td>0.001541</td>
<td>0.001169</td>
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<td>1975</td>
<td>0.001413</td>
<td>0.001948</td>
<td>0.003768</td>
<td>0.004027</td>
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</tr>
<tr>
<td>1979</td>
<td>0.003634</td>
<td>0.002752</td>
<td>0.001966</td>
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### IMMIG: TOTAL NUMBER OF IMMIGRANTS ARRIVING IN SOUTH AFRICA

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Source: South Africa, Department of Statistics, 1978.</th>
</tr>
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<tbody>
<tr>
<td>1945</td>
<td>2949</td>
<td></td>
</tr>
<tr>
<td>1949</td>
<td>15576</td>
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</tr>
<tr>
<td>1953</td>
<td>17267</td>
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<tr>
<td>1957</td>
<td>14631</td>
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<tr>
<td>1961</td>
<td>16373</td>
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<tr>
<td>1965</td>
<td>38337</td>
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</tr>
<tr>
<td>1969</td>
<td>41446</td>
<td></td>
</tr>
<tr>
<td>1973</td>
<td>24016</td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>24822</td>
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</tr>
</tbody>
</table>

### EMIG: TOTAL NUMBER OF EMIGRANTS LEAVING SOUTH AFRICA

<table>
<thead>
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<th>Year</th>
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<th>Source: South Africa, Department of Statistics, 1978.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1945</td>
<td>4881</td>
<td></td>
</tr>
<tr>
<td>1949</td>
<td>9403</td>
<td></td>
</tr>
<tr>
<td>1953</td>
<td>10328</td>
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</tr>
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<td>1957</td>
<td>11034</td>
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<td>1961</td>
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<td>1965</td>
<td>9479</td>
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<td>1969</td>
<td>9313</td>
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<tr>
<td>1973</td>
<td>6401</td>
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<tr>
<td>1977</td>
<td>26000</td>
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</tbody>
</table>

### INATXPIR: AVERAGE INDEX OF TOTAL TAXES PAID BY MANUFACTURING, MINING AND COMMERCIAL ENTERPRISES, 1969-70 = 100

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1958</td>
<td>28.6667</td>
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<tr>
<td>1962</td>
<td>45.3333</td>
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<tr>
<td>1966</td>
<td>67.</td>
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<tr>
<td>1970</td>
<td>100.</td>
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</tr>
<tr>
<td>1974</td>
<td>301.667</td>
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</tr>
</tbody>
</table>
### RTAXRMI: Total Real Revenue from Taxes on Mining Companies, in Thousands of Constant (1953) Rand

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>41058.1</td>
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<tr>
<td>1959</td>
<td>40183.7</td>
</tr>
<tr>
<td>1963</td>
<td>86279.7</td>
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<tr>
<td>1967</td>
<td>84107.4</td>
</tr>
<tr>
<td>1971</td>
<td>92822.7</td>
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<tr>
<td>1975</td>
<td>276481.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>45219.6</td>
</tr>
<tr>
<td>1959</td>
<td>54013.7</td>
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<tr>
<td>1963</td>
<td>85434.6</td>
</tr>
<tr>
<td>1967</td>
<td>90782.6</td>
</tr>
<tr>
<td>1971</td>
<td>75775.2</td>
</tr>
<tr>
<td>1975</td>
<td>193882.2</td>
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</table>


### RPRG: Real Gold Price in Constant (1953) Rand per Ounce, Deflated by the Price of Imports (+)

<table>
<thead>
<tr>
<th>Year</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1945</td>
<td>45.9559</td>
</tr>
<tr>
<td>1949</td>
<td>35.2609</td>
</tr>
<tr>
<td>1953</td>
<td>25.</td>
</tr>
<tr>
<td>1957</td>
<td>23.9433</td>
</tr>
<tr>
<td>1961</td>
<td>24.7871</td>
</tr>
<tr>
<td>1965</td>
<td>23.1922</td>
</tr>
<tr>
<td>1969</td>
<td>26.6407</td>
</tr>
<tr>
<td>1973</td>
<td>50.4733</td>
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<tr>
<td>1977</td>
<td>46.7735</td>
</tr>
<tr>
<td>1981</td>
<td>76.7773</td>
</tr>
</tbody>
</table>

**Source:** South African Reserve Bank, 1961-1982.

### RPRG: Real Gold Price in Constant (1953) Rand per Ounce, Deflated by the Consumer Price Index (+)

<table>
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<tr>
<th>Year</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1945</td>
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</tr>
<tr>
<td>1949</td>
<td>31.407</td>
</tr>
<tr>
<td>1953</td>
<td>25.</td>
</tr>
<tr>
<td>1957</td>
<td>22.613</td>
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<tr>
<td>1961</td>
<td>20.9849</td>
</tr>
<tr>
<td>1965</td>
<td>19.185</td>
</tr>
<tr>
<td>1969</td>
<td>19.8768</td>
</tr>
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<td>1973</td>
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<td>1977</td>
<td>43.2749</td>
</tr>
<tr>
<td>1981</td>
<td>82.5578</td>
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</table>

**Source:** South African Reserve Bank, 1961-1982.
### CPI: CONSUMER PRICE INDEX (ALL ITEMS), 1953 = 100

<table>
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<tbody>
<tr>
<td>Index</td>
<td>68.7</td>
<td>79.6</td>
<td>100.</td>
<td>110.2</td>
<td>119.3</td>
<td>130.8</td>
<td>147.7</td>
<td>189.5</td>
<td>296.8</td>
<td>484.8</td>
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</table>


### INT: NOMINAL RATE OF INTEREST ON LONG-TERM GOVERNMENT STOCK

<table>
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<tbody>
<tr>
<td>Rate</td>
<td>2.63</td>
<td>3.6</td>
<td>4.33</td>
<td>5.25</td>
<td>4.75</td>
<td>6.5</td>
<td>8.13</td>
<td>10.</td>
<td>9.38</td>
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</table>


### LNW: TOTAL NUMBER OF NONWHITES EMPLOYED IN MINING, MANUFACTURING, CONSTRUCTION, TRANSPORTATION AND CENTRAL GOVERNMENT (‡‡)

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Number</td>
<td>1295914.</td>
<td>1390415.</td>
<td>1747114.</td>
<td>1961314.</td>
<td>2222037.</td>
<td>2249445.</td>
</tr>
</tbody>
</table>

LW: TOTAL NUMBER OF WHITES EMPLOYED IN MINING,
MANUFACTURING, CONSTRUCTION, TRANSPORTATION AND GOVERNMENT (**)  

1958 473081  478257  476366  483933  
1962 498526  517104  542898  532289  
1966 551383  564520  571409  577265  
1970 575324  594025  585273  588364  
1974 591979  613461  635212  637765  
1978 634587  


PARTNW: NONWHITE PARTICIPATION RATE (RATIO OF TOTAL NONWHITE EMPLOYMENT IN MINING, MANUFACTURING, CONSTRUCTION, TRANSPORTATION AND GOVERNMENT TO TOTAL NONWHITE POPULATION) (*) (**)  

1958 0.106423  0.106895  0.094951  0.094439  
1962 0.093498  0.095321  0.099909  0.102409  
1966 0.104812  0.103553  0.102674  0.104058  
1970 0.105255  0.10652  0.101432  0.105458  
1974 0.107024  0.105944  0.105961  0.113658  
1978 0.115439  


PARTW: WHITE PARTICIPATION RATE (RATIO OF TOTAL WHITE EMPLOYMENT IN MINING, MANUFACTURING, CONSTRUCTION, TRANSPORTATION AND GOVERNMENT TO TOTAL WHITE POPULATION) (*) (**)  

1958 0.158592  0.157581  0.155219  0.155156  
1962 0.157066  0.159403  0.162983  0.156188  
1966 0.157954  0.157819  0.156336  0.154102  
1970 0.150176  0.149138  0.146282  0.144313  
1974 0.142582  0.144923  0.14704  0.146109  
1978 0.143963  

AVRWM: AVERAGE ANNUAL REAL WAGE RATE OF
NONWHITEs EMPLOYED IN MINING, MANUFACTURING,
CONSTRUCTION, TRANSPORTATION AND GOVERNMENT,
IN CONSTANT (1953) RANDS (**)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage</td>
<td>236.561</td>
<td>255.029</td>
<td>322.249</td>
<td>361.909</td>
<td>479.186</td>
</tr>
<tr>
<td>Wage</td>
<td>236.209</td>
<td>259.541</td>
<td>328.965</td>
<td>379.923</td>
<td>532.387</td>
</tr>
<tr>
<td>Wage</td>
<td>245.955</td>
<td>268.168</td>
<td>347.945</td>
<td>406.351</td>
<td>549.99</td>
</tr>
<tr>
<td>Wage</td>
<td>249.849</td>
<td>317.514</td>
<td>348.98</td>
<td>427.306</td>
<td>549.664</td>
</tr>
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</table>


AVRWM: ANNUAL AVERAGE REAL WAGE RATE OF
WHITEs EMPLOYED IN MINING, MANUFACTURING,
CONSTRUCTION, TRANSPORTATION AND GOVERNMENT,
IN CONSTANT (1953) RANDS (**)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wage</td>
<td>1489.35</td>
<td>1600.11</td>
<td>1942.61</td>
<td>2361.07</td>
<td>2537.51</td>
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<tr>
<td>Wage</td>
<td>1543.65</td>
<td>1619.94</td>
<td>1982.2</td>
<td>2439.16</td>
<td>2549.86</td>
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<tr>
<td>Wage</td>
<td>1578.85</td>
<td>1709.7</td>
<td>2104.31</td>
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<td>2484.29</td>
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<td>Wage</td>
<td>1592.16</td>
<td>1849.22</td>
<td>2163.15</td>
<td>2470.78</td>
<td>2406.8</td>
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</table>


RWASERV: INDEX OF AVERAGE ANNUAL REAL CASH WAGES OF FULL-TIME
DOMESTIC SERVANTS

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Wage</td>
<td>54.8198</td>
<td>58.3333</td>
<td>64.7935</td>
<td>75.4617</td>
<td>76.2466</td>
</tr>
<tr>
<td>Wage</td>
<td>55.6199</td>
<td>58.4808</td>
<td>67.8595</td>
<td>75.461</td>
<td>76.2466</td>
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<tr>
<td>Wage</td>
<td>56.2806</td>
<td>60.727</td>
<td>71.4462</td>
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<td>76.8165</td>
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<tr>
<td>Wage</td>
<td>57.3132</td>
<td>62.6854</td>
<td>72.9636</td>
<td>76.8165</td>
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# Average Annual Real Unskilled Wage Rate (Wage Rate of Nonwhites Employed in Mining), in Constant (1953) RandS

<table>
<thead>
<tr>
<th>Year</th>
<th>Wage Rate</th>
<th>Wage Rate</th>
<th>Wage Rate</th>
<th>Wage Rate</th>
</tr>
</thead>
<tbody>
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<td>1955</td>
<td>123.264</td>
<td>123.196</td>
<td>122.123</td>
<td>127.625</td>
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<td>1959</td>
<td>120.963</td>
<td>133.263</td>
<td>127.531</td>
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<tr>
<td>1963</td>
<td>130.064</td>
<td>132.467</td>
<td>136.756</td>
<td>140.065</td>
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<tr>
<td>1967</td>
<td>141.234</td>
<td>142.718</td>
<td>144.36</td>
<td>145.646</td>
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<tr>
<td>1971</td>
<td>145.384</td>
<td>187.027</td>
<td>139.801</td>
<td>264.341</td>
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<tr>
<td>1975</td>
<td>376.35</td>
<td>402.855</td>
<td>411.429</td>
<td>439.446</td>
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</table>


# BSECSCHS: Number of Blacks Enrolled in Secondary School, per 1000 of the Total Black Population (*)

<table>
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<tr>
<th>Year</th>
<th>Black Enrollment</th>
<th>Black Enrollment</th>
<th>Black Enrollment</th>
<th>Black Enrollment</th>
</tr>
</thead>
<tbody>
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<td>1956</td>
<td>3.29876</td>
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<td>1964</td>
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<td>7.79492</td>
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<td>1976</td>
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<tr>
<td>1980</td>
<td>30.4383</td>
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**Sources:** South Africa, Bureau of Statistics, 1965, 1966; South Africa, Department of Statistics, 1968, 1978; South Africa, Department of Information, 1974-1983; South African Institute of Race Relations, 1958-1982. Observations for the years 1957 and 1959 were not obtained, and these values are linearly interpolated.

# BUNIVS: Number of Students Enrolled in Black Universities (Fort Hare, University of the North, Zululand and Medunsa), per 1000 of the Total Black Population (*)

<table>
<thead>
<tr>
<th>Year</th>
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<th>Students Enrollment</th>
<th>Students Enrollment</th>
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<tr>
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<td>0.19112</td>
<td>0.193471</td>
<td>0.227425</td>
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<tr>
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<td>0.279065</td>
<td>0.267139</td>
<td>0.294252</td>
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<td>1980</td>
<td>0.485701</td>
<td>0.456262</td>
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NWUNIVS: NUMBER ON NONWHITE STUDENTS IN ALL UNIVERSITIES AND UNIVERSITY COLLEGES, PER 1000 OF THE TOTAL NONWHITE POPULATION (*)

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<td></td>
<td>0.1096</td>
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CITEACHS: RATIO OF THE NUMBER OF COLOURED AND INDIANS ENROLLED IN TEACHERS' TRAINING COLLEGES TO THE TOTAL COLOURED AND INDIAN POPULATION (*)

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<td>0.0017</td>
<td>0.0017</td>
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</table>


WUNIVS: NUMBER OF WHITE FULL-TIME STUDENTS ENROLLED IN SOUTH AFRICAN UNIVERSITIES, PER 1000 OF THE WHITE POPULATION (*)

|------|-------|-------|-------|-------|-------|-------|

RDEF: AMOUNT VOTED ANNUALLY TO DEFENCE BUDGET FROM CENTRAL GOVERNMENT REVENUE ACCOUNT, IN THOUSANDS OF CONSTANT (1953) RANDS (++)

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<tr>
<td></td>
<td>32979.5</td>
<td>38427.5</td>
<td>59392.6</td>
<td>101710.</td>
<td>19656.6</td>
<td>144631.</td>
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DEFS: RATIO OF GOVERNMENT DEFENCE EXPENDITURE (AMOUNT VOTED TO DEFENCE BUDGET FROM CENTRAL GOVERNMENT REVENUE ACCOUNT) TO GROSS NATIONAL PRODUCT AT MARKET PRICES (++)

<table>
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<tr>
<td></td>
<td>0.007506</td>
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<td>0.016032</td>
<td>0.024979</td>
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</table>


DEFSP: REAL PER CAPITA DEFENCE EXPENDITURE (AMOUNT VOTED ANNUALLY TO DEFENCE BUDGET FROM CENTRAL GOVERNMENT REVENUE ACCOUNT), IN CONSTANT (1953) RANDS (*) (++)

|------|-------|-------|-------|-------|-------|-------|

**REGHOM: TOTAL REAL EXPENDITURE BY SOUTH AFRICAN GOVERNMENT INSTITUTIONS IN THE BLACK HOMELANDS, IN THOUSANDS OF CONSTANT (1953) RANDS**

<table>
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<td></td>
<td>23117.1</td>
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<td>44550.1</td>
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**BSTRIKE: NUMBER OF BLACK WORKERS INVOLVED IN STRIKES AND WORK STOPPAGES**

<table>
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<tbody>
<tr>
<td></td>
<td>3223.</td>
<td>4165.</td>
<td>90082.</td>
<td>14950.</td>
<td>84706.</td>
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<td>3210.</td>
<td>57656.</td>
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<td>2100.</td>
<td>4067.</td>
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<td>1660.</td>
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**Source:** South Africa, Department of Information, 1974–1983.

**WKSTOPS: RATIO OF THE NUMBER OF NONWHITE WORKERS INVOLVED IN WORK STOPPAGES TO THE NUMBER OF NONWHITES EMPLOYED IN MINING, MANUFACTURING, CONSTRUCTION, TRANSPORTATION AND GOVERNMENT (++)**

<table>
<thead>
<tr>
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<td>0.002134</td>
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**RWAWKSTP: REAL WAGES LOST DUE TO WORK STOPPAGES BY NONWHITE WORKERS, IN CONSTANT (1953) RANDS**

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td>1683.49</td>
<td>4002.71</td>
<td>194471.</td>
<td>15605.1</td>
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<td>2481.56</td>
<td>2052.05</td>
<td>115456.</td>
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<tr>
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<td>1338.56</td>
<td>1723.69</td>
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<td>660.377</td>
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<td>18015.7</td>
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</table>

**Sources:** South Africa, Department of Information, 1981; South African Reserve Bank, 1961–1982.
BAN: NUMBER OF BANNING ORDERS IN FORCE AGAINST PERSONS

<table>
<thead>
<tr>
<th>Year</th>
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<td>71</td>
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<tr>
<td>1960</td>
<td>92</td>
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<tr>
<td>1964</td>
<td>343</td>
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<tr>
<td>1968</td>
<td>490</td>
</tr>
<tr>
<td>1972</td>
<td>237</td>
</tr>
<tr>
<td>1976</td>
<td>146</td>
</tr>
<tr>
<td>1980</td>
<td>155</td>
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</table>


WADETS: RATIO OF THE NUMBER OF NONWHITE EMPLOYEES TO WHITE EMPLOYEES COVERED BY MINIMUM WAGE DETERMINATIONS BY THE WAGE BOARD

<table>
<thead>
<tr>
<th>Year</th>
<th>Value 1</th>
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<th>Value 3</th>
<th>Value 4</th>
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</thead>
<tbody>
<tr>
<td>1965</td>
<td>2.79486</td>
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<td>2.84225</td>
<td>3.24636</td>
</tr>
<tr>
<td>1969</td>
<td>3.30781</td>
<td>3.25966</td>
<td>3.28025</td>
<td>3.40333</td>
</tr>
<tr>
<td>1977</td>
<td>5.12351</td>
<td>5.13771</td>
<td>5.32075</td>
<td>6.15166</td>
</tr>
</tbody>
</table>

Source: South Africa, Department of Information, 1981.

CIBURS: NUMBER OF INDIAN AND COLOURED ADULTS PLACED IN EMPLOYMENT BY LABOUR BUREAUX, PER 1000 OF THE INDIAN AND COLOURED POPULATION (*)

<table>
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<tr>
<th>Year</th>
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<tr>
<td>1977</td>
<td>7.27964</td>
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271
PASLAW: NUMBER OF PERSONS PROSECUTED FOR OFFENCES RELATING TO REFERENCE BOOKS AND INFLUX CONTROL (**)

<table>
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<tr>
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<tbody>
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<td>232420.</td>
<td>337604.</td>
<td>413639.</td>
<td>390031.</td>
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<td>264324.</td>
<td>356812.</td>
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<td>395666.</td>
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<td>283439.</td>
<td>365911.</td>
<td>375417.</td>
<td>437390.</td>
<td>632077.</td>
<td>515608.</td>
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<td>314208.</td>
<td>396836.</td>
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PASLAW: NUMBER OF PERSONS PROSECUTED FOR OFFENCES RELATING TO REFERENCE BOOKS AND INFLUX CONTROL, PER 1000 OF THE BLACK POPULATION (*) (**)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
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<td>27.0476</td>
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<td>29.725</td>
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<td>7.34491</td>
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<td>28.7623</td>
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DST: DUMMY VARIABLE FOR THE DURBAN STRIKES OF 1973

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(PT: DUMMY VARIABLE FOR THE PORTUGUESE DECOLONIZATION OF 1974)

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(DSO: DUMMY VARIABLE FOR THE SOWETO RIOTS OF 1976)

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(T: LINEAR TIME TREND (1945 = 1))

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<td>33.</td>
<td>37.</td>
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</table>

(*) Population data required to construct per capita series exclude the population of the Transkei after 1977 and of Bophutatswana after 1978.

(+) From 1945 to 1957 the nominal price of gold is assumed to be fixed at R25 per ounce. After 1957 it follows the average of daily fixings in the London market.

(**) From 1951 to 1977 these data refer to the number of persons
prosecuted or sent to trial. From 1978 to 1981 they include all those persons arrested for "pass law" offences. The relevant laws are mainly the Black Urban Areas (Consolidation) Act and the Black Labour Relations Regulation Act, or their predecessors (see appendix 2). Observations for 1963 and 1965 were not obtained and these values are linearly interpolated.

(**) Data for the years 1968 and 1969 were not obtained, and these values are linearly interpolated.

(*+) The central government sector is defined to include the Post Office.
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