# DETERMINANTS OF PORTFOLIO PERFORMANCE: CIBC CANADIAN BALANCED FUNDS

by

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# APPROVAL

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# ABSTRACT

It is widely believed that the *asset allocation decision* is one of the most important components in determining portfolio performance. This paper will attempt to provide a more in-depth discussion about *asset allocation policy* and evaluate whether **passive** asset allocation management can generate a better portfolio return compared to **active** asset allocation management over a 10-year time. Past research finds that an *asset allocation policy* does play a significant part in determining both return and risk in many portfolios. However, other components, such as market timing and security selection, can also contribute to the overall return under certain conditions.

The purpose of paper is to revisit a study of this issue by Brinson, Hood and Beebower using a different data set. In this project, I analyze CIBC Canadian balanced funds over a 10-year period (January 1995 through December 2004).

**Keywords: portfolio performance, asset allocation, and Canadian balanced funds**

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# INTRODUCTION

In recent years, numerous investment advisors and analysts have strongly suggested that the asset allocation decision[1] is a major contributor to the variability in the return on a typical investor portfolio – more so than any other factors, including market timing and security selection. Traditionally, investors tend to focus on the best-performing stocks or mutual funds for a given period, typically a year. Now, it is generally accepted that having a right asset allocation is the key to investing success. Long-term investors can benefit from the allocation mixture of their portfolios through the right diversification of investments. As for market timing and security selection, these components can potentially add value to the portfolio, but are harder to measure and quantify over time.

Optimal asset allocation decision relies heavily on Modern Portfolio Theory (MPT). MPT states that the optimal portfolio enhances the return with acceptable risk. An asset allocation policy assists the portfolio managers in assessing the trade off between the expected return and risk associated with various asset classes. In the early 1950's, Markowitz was the first to propose the concept of Portfolio Theory, and Sharpe further developed the theory in the 1960's. Based on the principle "Don't put all your eggs in one basket", the investors should know intuitively that it is wise to diversify their

[1] Through this paper, the terms *asset allocation decision*, *asset allocation policy* and *investment policy* are interchangeably used.

portfolios. Markowitz also introduced the concept of an "efficient portfolio"[2]. The model developed by Sharpe[3] [supply reference] is known as CAPM (Capital Asset Pricing Model). If CAPM holds, the market exhibits mean-variance efficiency and everyone hold the same combination of the market portfolio based on the separation theory[4].

The other related theory is the Efficient Market Hypothesis (EMH). The EMH is an idea partly developed in the 1960s by Eugene Fama, which has been extended to the asset allocation decision. It states that it is impossible to beat the market because the prices already incorporate and reflect all available information. This is still a highly controversial and disputed theory. If EMH holds, it is futile to search for undervalued stocks or try to predict the market trends through any methodologies or technical analysis; there are no sustainable advantages that investors can outperform the "market". If the market is truly efficient, then do investors really need manage the asset allocation actively? However, several studies, such as Ferson and Hervey (1993), have produced results that seem to indicate stock returns are predictable. They argue that the efficient market theory is a by-product of many investors' expectations on past prices, past earnings, previous tracking records, etc.

Brinson, Hood and Beebower (1986) find that asset allocation is the most important determinant of portfolio performance. In this paper, I decided to utilize the

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[2] An efficient portfolio is the one that has the smallest attainable portfolio risk for a given level of expected return or the largest expected return for a given risk.
[3] Paula H. Hogan, "Portfolio Theory Creates New Investment Opportunities," *Financial Analyst Journal*, vol. 39 (1986): 39-43.
[4] According to the *Separation Theorem*, investors should hold the same composition of assets if they have the same risk tolerance.

BHB framework to analyze the balance funds in Canada over a ten-year period (Jan 1994 through Dec 2004), essentially replicating their study but on a different collection of data.

# LITERATURE REVIEW

The study by Brinson, Hood and Beebower (BHB 1986) tracked the results for 91 large U.S. pension plans over the period spanning 1974 to 1983. They analyzed whether a portfolio's asset allocation policy significantly affects portfolio performance. The results were that over the 10-year period, asset allocation policy represents over 90 percent of the variation in the portfolio returns (Figure 1).

A similar study by Blake et al (1999) on more than 300 U.K. pension plans from 1986 to 1994 produced the same findings. Asset allocation policy was directly responsible for most of the time-series variation in portfolio returns while market timing and asset section appeared to be far less influential.

The Vanguard Group Inc. also used the BHB model to conduct an analysis of a 40-year database of monthly returns on (1) 420 U.S. balanced mutual funds from 1962 to 2001 and (2) the Mercer Pooled Fund Survey of manager balanced and growth funds in Australia over a 10-year period ending in June 2003. They compared the performance to those corresponding to each fund's benchmark return. The study finds that, on average, 77% of the short-term variability of a fund's return can be attributed to it asset allocation policy. However, the result for each fund depends on its degree of active management. For example, a fund that implements its strategy with index funds and rebalances the asset allocation to market benchmarks will clearly produce better a performance. The analysis also shows that asset allocation policy is the dominant influence on US and Australian total fund returns in all market environments. Market timing and stock

selection play only minor roles and over the long-term have detracted value and added risk. Furthermore, the study found that, on average, higher cost funds deliver lower returns relative to the benchmark.

Conversely, there are studies that disprove the significance of asset allocation policy as a determinant of portfolio return. This leads to some criticisms of fixing long-term asset weighting through the passive asset allocation management. According to Hensel et al (1991), asset allocation is not a significant factor if the portfolio is a diversified mix, but still an important determinant of total returns if the portfolio is mainly Treasury bill investments. Jahnke (1997) also argues that the analysis should emphasize the holding period of the returns instead of return variability. He further demonstrates that in the Brinson's sample of 91 large U.S. pension plans over the 1974-1983 periods, asset allocation accounts for less than 15% of the range in actual holding period returns. In John Nuttall's article (1997), supported by Ibbotson and Kaplan (2000), asset allocation decision is usually responsible for only a minor part of portfolio return and an investor who bases a portfolio return on asset allocation should invest in index funds only. This finding challenges the view in Brinson's 1986 article. Furthermore, Zurz et al (1999) and Ibbotson and Kaplan (2000) state that asset allocation decision is less important when explaining the cross-sectional return variation due to the similarity of asset mixes across funds.

## Active Asset Allocation

One of the strong arguments from Jahnke (1997) is that there is no empirical evidence to set long-term fixed asset allocation weight when the expected returns vary over time for a pension plan or an individual investor. Since investment opportunity

changes over time, it will be more advantageous to manage a portfolio actively for a potentially better return. According to Hensel et al (1991)

> "In performance attribution there is usually a base return (representing the naïve portfolio) and a series of effects (representing the impact of judgements). If the base return is itself added to one of the effects, it exaggerates the impact of the corresponding judgment. Essentially, this is equivalent to assuming that the native portfolio always has zero return. The native portfolio thus implies no investment whatsoever; this is clearly unrealistic."

Their study during the period from 1985 to 1988 for seven Russell U.S. sponsors shows that any specific asset allocation policy may have a significant impact on total plan returns, but do not play the dominant role that Brinson had suggested. Market timing and security selection can enhance the portfolio performance.

Anson (2004) takes a very different approach while looking into the asset allocation decision to support the tactical asset allocation. According to him, a two asset-class system generates the asset allocation decision, beta drivers and alpha drivers. Beta drivers are from the asset allocation policy and provide broad economic exposure to the financial markets, such as a 60/40 split into the stock and bond market within a specified risk tolerance. In other words, the performance of the beta drivers can be similar to a market index without any active risk. Alpha drivers tend to provide added return beyond the return offered through passive exposure for the financial market to outperform the market while also providing a downside protection. The alpha drivers are asset classes that either lack a strong correlation to or have non-linear payout function with the

financial market such as through alternative investments into the portfolio to enhance the return performance.

## Passive Asset Allocation

Other studies have consistently argued over time that it seems to be harder for portfolio managers to outperform the benchmark. Therefore, it is better to stick with a fixed asset allocation portfolio that is composed of acceptable risk tolerance and objectives. This is similar to the strategies advocated by Warren Buffett and Charles Ellis. If the EMH exists and CAPM holds, the passive asset allocation management can provide a better return than the active asset allocation management with a lower cost. Most funds would have been better off with their strategic asset allocations placed in passive index funds.

Some empirical testing results at different times are consistent with the EMH. In 1986, Jensen published his findings for 115 mutual funds in the period of 1945 to 1964. He concluded that on average, the performance of the mutual funds selected through predictions of security prices did not outperform the passive asset allocation strategy. In fact, there was also very little evidence that any individual fund significantly outperform those which are based on random security picks. Henriksson also got the similar results with 116 open-end mutual funds for the period 1968 to 1980.

Furthermore, in Brinson et al's finding conducted starting from December 1977 until December 1987, active investment decision by plan sponsors and managers did little to improve performance. In fact, in their first article in 1986, the effect of market timing and security selection actually had a negative contribution to the total return over the 10-

year period from 1977 to 1987. The investment policy with fixed weight asset allocation not only provided the larger portion of return, but also explained 93.6 percent of total return variation. Then in their 1991 article, they further stated

> "Active management not only had no measurable impact on returns, but (in the absence of a proxy for the variability of the respective pension liabilities), it appears to have increased risk by a small margin."[5]

Finally, Brinson et al concluded that extra returns seemed to be unrelated to active management and it is even harder for managers to outperform equity benchmarks than bond and cash benchmarks.

Although Blake et al's study (1999) supports the importance of strategic asset allocation in portfolio returns, they also theorized about how administrative behaviour can affect the asset allocation of U.K. pension plans. Pension managers are motivated to produce similar portfolio returns, and the empirical evidence suggests they do that regardless of the reasonably wide cross-sectional variation in asset allocation dynamics. This can be an agency problem that plan sponsors can keep their high reputation within the mandate; therefore, they only engage in active management to some extent.

Arshanapalli et al's findings (2001) suggest that the fixed-weight asset allocation model is not a bad choice since the tactical asset allocation appears to require the ability to forecast effectively in order to outperform the strategic asset allocation. They also mention that the active management fees can be an important additional factor to consider in comparing tactical asset allocation model to a fixed-weight alternative since

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[5] Gary P. Brinson, Brian D. Singer and Gilbert L. Beebower, "Determinants of Portfolio Performance II: An Update," *Financial Analysts Journal*, vol. 47 (1991): 44-52.

the final performance should be net of management fees to provide a true picture of return.

The most recent relevant study supporting passive asset allocation management is from Jan Annaert et al. (2005). Their study concentrates on an international and multiple-asset investment strategy using weight-based techniques. One of the main reasons is that it is very difficult to invest globally with in-depth knowledge. They do not realize superior performance either through appropriate timing or selection skills due to cultural and geographical limitations. Therefore, the result shows that the strategic asset allocation is better than the tactical asset allocation.

# METHOD

The main purpose of this paper is to update the BHB study with different data set to see whether investment policy is still the dominant force in determining total portfolio outcomes. To tailor this paper specifically to my current employer, only CIBC Securities Inc. Canadian balanced fund category's quarterly data will be used. The data set ranges from January 1995 through December 2004 for this particular case study and includes the following fund types:

- CIBC Balanced Fund
- CIBC Balanced Portfolio
- CIBC Conservative Portfolio
- CIBC Income Portfolio
- CIBC Moderate Portfolio
- CIBC Very Conservative Portfolio

Principally, we follow the original BHB framework (Table 1 to 3) to show our results (Table 5 to 8). All tables are generally the same as what was done in the BHB study. Table 1 illustrates the simplified BHB framework for analyzing portfolio returns. The investment strategy in the BHB study is comprised of a combination of investment policy, market timing, and stock selection and the others. The "others" is generally small around 0.07% that we can assume the others equal to zero. Since the actual return within

each asset class for the funds was not available and the other factor can be assumed zero, the security selection attribution can count for the total active return minus market timing attribution by definition (Table 4). Quadrant I represents the return of investment policy by using the fund's benchmark. We adopt the current benchmark weight under CIBC's Balanced category here as the policy weight for each asset class, 24.4% for cash, 45.33% for bond, and 31.27% for Canadian equity. Quadrant II represents the returns from the investment policy and market timing ability. Marketing timing is the tactical approach for return enhancement or risk reduction to under or over estimate the asset class relative to its normal weighting. Quadrant III represents returns due to investment policy and security selection. Security selection is the active selection of investments within each asset class. Quadrant IV represents the actual fund return for the testing period. Table 2 lists the calculations for the values on these quadrants, and Table 3 gives the computational methods for determining contributors to total fund returns.

Table 5 summarizes the data collected from each fund. Since the data for asset weights was not available, we used the current asset weights of each fund for actual weight calculation to assume that the asset weights do not change much over time here. Since there is always a mandate for the balanced mutual fund, the assets weight typically, do not change much. The balanced portfolios consists of Canadian equity, marketable bonds (fixed income debt with a maturity of one year and longer, and excluding private placement and mortgage-backed-securities), cash equivalents (fixed income obligations with maturities less than one year) and a miscellaneous category, "other" that include convertible securities, international holdings and mortgage-backed-bonds. Four out six CIBC balanced funds have U.S. and international equity exposures from 5.8 to 19.6

percent. To follow the BHB framework, we use a Canadian equity/bonds/cash equivalent sub-portfolio in all quadrants' calculations except the total fund actual return.

The market indexes used as passive benchmark returns are along the following manner. We use the S&P/TSX Composite Index for the Canadian equity. RBC CM Canadian Bond Index for the bond component, and the 30-day Canadian Treasury bill rate for cash equivalents.

# DISCUSSION OF RESULTS

Results are displayed numerically in Table 5 to Table 9 and graphically in Figure 2. The average annualized total return of the entire balanced portfolios (and not just the Canadian equity/bonds/cash equivalents portion of the plan) over the 10-year period (Table 6: Quadrant IV) is 7.04 percent. The average portfolio loses 3.49 percent per year in market timing and loses 2.24% per year in security selection. The average annualized total return of the normal policy portfolio for the sample is 13.06 percent (Table 6: Quadrant I).

Table 7 provides more detail on the various effects of active management and investment policy. The market timing effect of each CIBC Canadian balanced fund ranges from -15.10 to 9.55 percent per year over the period. The security selection factor ranges from -23.24 to 14.34 percent per year. On average, total active management under CIBC Canadian balanced funds costs the average portfolio 5.73 percent per year during our testing period. It clearly shows that investment policy dominates the investment strategy again in Canadian balanced funds. The "Tech Bubble" in 2000, possible mandate changes or active asset allocation management from the fund managers are possible explanations for the wide range of outcomes and standard deviation.

To illustrate the "Tech Bubble" impact further, Table 8 indicates the average annualized return of the entire balanced portfolios from January 2001 to December 2004. The average returns in all four quadrants are far less after the "Tech Bubble. The average active management during this period costs CIBC Canadian balanced portfolios around

4.65%. The only major difference is from the security selection category. The explanation can be that some of underperformed stocks have been out of the equity market in Canada.

Table 9 shows the relative amount of variance contributed by each quadrant to the return of the total portfolio. It demonstrates directly the relative importance of the decision affecting total portfolio return. The result from table 8 is essentially consistent with the BHB study that investment policy or asset allocation policy dominates the portfolio performance. The investment policy return in Quadrant I explain on average 71.10 percent of total return variation. Returns due to policy and timing add values to the variance of 83.68 percent. Since we assume that, the return can be explained only by policy, market timing and stock selection, return due to policy and selection increase the variance of 87.42 percent.

For personal interest, I also ran data from the RBC balanced fund, the largest fund in Canada, with asset under management over $7.3 billion. Data from the same period, January 1995 to December 2004, was used. Interestingly, RBC balanced funds indicates 88.24% from investment policy of total return variation. In addition, total active management for RBC balanced funds will cost the portfolio 6.35 percent per year on average.

# CONCLUSION

The conclusion drawn from this study is that the investment policy is the dominant force in determining total portfolio outcomes and passive asset allocation management provides a better fund return. We actually obtain a very similar result since over 70 percent of investment policies are similar to the Vanguard Group's study on 420 U.S. balanced mutual funds and pooled funds in Australian. This study does not have the same significant level of 90 percent to explain the investment policy play an importance part of the investment strategy, like the study on 91 U.S. pension plans or 300 U.K pension plans.

Because this particular sample period is relatively volatile for the equity market and the numbers of fund is limited, it is reasonable to raise the question whether different results would be obtained by increasing the number of funds and time horizon. In our study, we only consider Canadian equity/bonds/cash equivalents for the asset allocation. Since CIBC Canadian balanced funds contain 5.8 to 19.6 percent in U.S and international equity components, this may potentially lead the result of high variance in the other factors of the total portfolio performance.

In addition, the result of our study also indicates that passive asset allocation management outperforms the active asset allocation management. The active management shows no value-added ability to the performance (Table 7).

# APPENDIX

**Figure 1:** **Percentage of Total Return Variation Explained by Investment Activity, Average of 91 Plans, 1973-1985.**

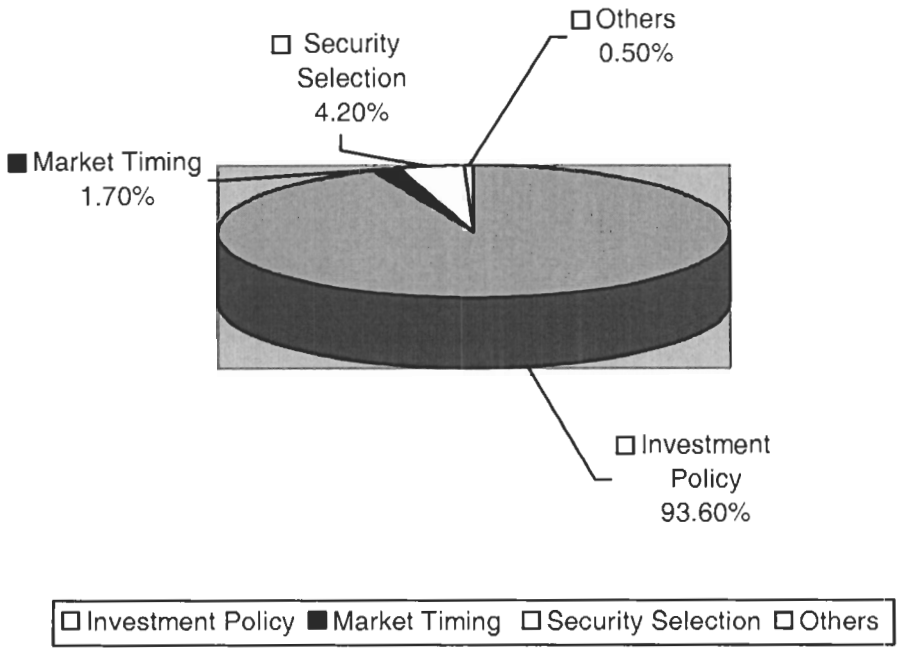


**Table 1: A Simplified Framework for Return Accountability**

| Timing | Selection: Actual | Selection: Passive |
|---|---|---|
| Actual | (IV) Actual Portfolio Return | (II) Policy and Timing Return |
| Passive | (III) Policy and Security Selection Return | (I) Policy Return (Passive Portfolio Benchmark) |

| | |
|---|---|
| Active return due to: | |
| Timing | II – I |
| Selection | III – I |
| Other | IV – III – II + I |
| Total Active Return | IV – I |

Source: Determinants of Portfolio Performance by Gary P. Brinson, L. Randolph Hood and Gilbert L. Beebower

**Table 2: Computational Requirements for Return Accountability**

| Timing | Selection: Actual | Selection: Passive |
|---|---|---|
| Actual | (IV) $\sum(Wai * Rai)$ | (II) $\sum(Wai * Rpi)$ |
| Passive | (III) $\sum(Wpi * Rai)$ | (I) $\sum(Wpi * Rpi)$ |

Wpi = Policy (passive) weight for asset class i

Wai = Actual weight for asset class i

Rpi = Passive return for asset class i

Rai = Actual return for asset class i

Source: Determinants of Portfolio Performance by Gary P. Brinson, L. Randolph Hood and Gilbert L. Beebower

**Table 3: Calculation of Active Contributions to Total Performance**

| Return Due to | Calculated By | Expected Value |
|---|---|---|
| Timing | (Quadrant II–Quadrant I) | >0 |
| | $\sum[(Wai * Rpi) - (Wpi * Rpi)]$ | |
| Security Selection | (Quadrant III–Quadrant I) | >0 |
| | $\sum[(Wpi * Rai) - (Wpi * Rpi)]$ | |
| Other | [Quadrant IV-(Quadrant II + Quadrant III + Quadrant I)] | N/A |
| | $\sum[(Wai - Wpi)(Rai * Rpi)]$ | |
| Total | (Quadrant IV–Quadrant I) | >0 |
| | $\sum[(Wai * Rai) - (Wpi * Rpi)]$ | |

Source: Determinants of Portfolio Performance by Gary P. Brinson, L. Randolph Hood and Gilbert L. Beebower

**Table 4: Modified Calculation of Active Contributions to Total Performance**

| Return Due to | Calculated By | Expected Value |
|---|---|---|
| Timing | (Quadrant II–Quadrant I) | >0 |
| | $\sum[(Wai * Rpi) - (Wpi * Rpi)]$ | |
| Security Selection | (Quadrant IV-Quadrant II) | >0 |
| | $\sum[(Wai * Rai) - (Wpi * Rpi)] - \sum(Wai * Rpi) + \sum(Wpi * Rpi)$ | |
| Total | (Quadrant IV–Quadrant I) | >0 |
| | $\sum[(Wai * Rai) - (Wpi * Rpi)]$ | |

**Table 5:** **Summary of Holdings of Six CIBC Canadian Balanced Funds, 1995-2004.**

| All Holdings | Average | Minimum | Maximum | Standard Deviation | Policy Benchmark |
|---|---|---|---|---|---|
| **Canadian Equity** | 26.0% | 16.0% | 35.6% | 7.4% | TSX Composite Index |
| **Bonds** | 37.6% | 27.7% | 49.0% | 7.1% | RBC CM Cdn Bond Index |
| **Cash Equivalents** | 19.4% | 9.6% | 27.7% | 8.9% | 30-Day Treasury Bills |
| **Other** | 7.1% | 8.1% | 7.4% | 3.4% | None |
| **Other Equity** | 9.9% | 7.0% | 3.8% | 9.9% | |
| | 100.0% | | | | |
| **Canadian Equity, Bonds & Cash Only** | | | | | |
| **Canadian Equity** | 31.3% | 30.0% | 31.7% | 11.5% | |
| **Bonds** | 45.3% | 52.0% | 43.6% | 5.6% | |
| **Cash Equivalents** | 23.4% | 18.0% | 24.7% | 9.2% | |
| | 100.0% | | | | |

**Table 6: Mean Annualized Returns by Activity, Six CIBC Canadian Balanced Funds, 1995-2004**

| Timing | Selection: Actual | Selection: Passive |
|---|---|---|
| Actual | (IV) 7.04% | (II) 9.57% |
| Passive | (III) 10.82% | (I) 13.06% |

| Active return due to: | | |
|---|---|---|
| Timing | II - I | -3.49% |
| Selection | **IV- II** | -2.24% |
| Other | | -0.00% |
| Total Active Return | IV – I | -5.73% |

**Table 7: Annualized 10-Year Returns of Six CIBC Canadian Balanced Funds, 1995-2004**

| Portfolio Total Returns | Average Return | Minimum Return | Maximum Return | Standard Deviation |
|---|---|---|---|---|
| **Policy** | 13.06% | -23.48% | 46.36% | 3.53% |
| **Policy and Timing** | 9.57% | -36.56% | 43.51% | 4.09% |
| **Policy and Selection** | 10.82% | -13.05% | 36.68% | 2.71% |
| **Actual Portfolio** | 7.04% | -26.13% | 26.93% | 7.32% |
| | | | | |
| **Active Returns** | | | | |
| **Timing Only** | -3.49% | -15.10% | 9.55% | 5.42% |
| **Security Selection Only** | -2.24% | -23.24% | 14.34% | 6.92% |
| **Total Active Return** | -5.73% | -26.09% | 9.06% | 7.67% |

**Table 8: Mean Annualized Returns by Activity, Six CIBC Canadian Balanced Funds, 2001-2004**

| Timing \ Selection | Actual | Passive |
|---|---|---|
| Actual | (IV) 3.15% | (II) 4.17% |
| Passive | (III) 6.12% | (I) 7.47% |

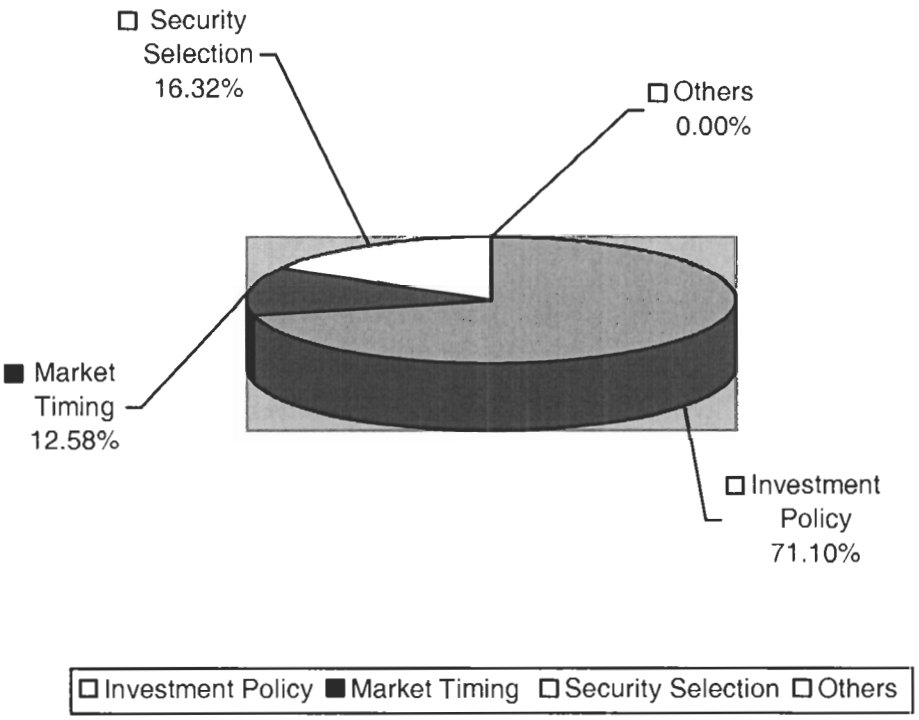
| Active return due to: | | |
|---|---|---|
| Timing | II - I | -3.30% |
| Selection | **IV- II** | -1.35% |
| Other | | -0.00% |
| Total Active Return | IV – I | -4.65% |

**Table 9: Percentage of Total Return Variation Explained by Investment Activity, Average of Six CIBC Canadian Balanced Funds, 1995-2004**

| Timing \ Selection | Actual | Passive |
|---|---|---|
| Actual | (IV) 100.00% | (II) 83.68% |
| Passive | (III) 87.42% | (I) 71.10% |

| | Variance Explained | | | |
|---|---|---|---|---|
| | Average | Minimum | Maximum | Standard Deviation |
| Policy | 71.10% | 56.08% | 74.79% | 6.72% |
| Policy and Timing | 83.68% | 81.19% | 90.17% | 6.37% |
| Policy and Selection | 87.42% | | | |

**Figure 2:** **Percentage of Total Return Variation Explained by Investment Activity, Average of Six CIBC Canadian Balanced Fund in Canada, 1995-2004.**



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