A Test of Momentum Trading Strategies in Foreign Exchange Markets: Evidence from the G7

Rob Bianchi, Michael E. Drew* and John Polichronis

School of Economics and Finance, Queensland University of Technology,

GPO Box 2434, Brisbane, Queensland, Australia, 4000.

* Corresponding author: Email: m.drew@qut.edu.au; Tel: +61-7-3864-1481; Fax: +61-7-3864-1500. We gratefully acknowledge the 'Applied Modeling in Economics & Finance (AMEF)' Research Centre, School of Economics and Finance, Faculty of Business, Queensland University of Technology for financial assistance. Any remaining errors are our own.

Abstract

In this trading strategy study, we ask three questions. First, does momentum exist in foreign exchange markets? Second, what is the impact of transactions costs on excess returns? And, third, can a consolidated trading signal garner excess returns and, if so, what is the source of such returns? Using total return momentum strategies in the foreign exchange markets of the G7 for the period 1980 through 2004, the answers from this study are as follows: we find evidence of momentum; however, such momentum appears transitory, particularly for longer look back periods. As expected, transaction costs have a material negative impact on excess returns. Finally, a consolidated signal garners excess returns; however, a bootstrap simulation finds the source of these returns is a function of autocorrelation.

JEL Classification: F31, G14

Key words: Foreign exchange, momentum, trading rules

---

1. Introduction

One of the most hotly contested ideas in the study of financial economics relates to the notion that capital markets are efficient in an informational sense. Trading rules, based on the premise that historical data is information rich about the future direction of asset prices, defies the received academic position of the efficient markets hypothesis (EMH) (Fama, 1970). However, one of the empirical challenges with tests of the EMH relates to the ambivalence that researchers have in rejecting the null hypothesis (in turn, providing acceptance to an extreme alternate hypothesis, that is, market inefficiency) and having employed a methodology limited by issues including: data mining, structural change and model instability; and, market volatility. It is our conjecture that it is this combination of an extreme alternate hypothesis (that is, market inefficiency), methodological limitations, and, the chance for profit, that has led to nothing short of a fascination regarding the topic of capital market efficiency by academe and practitioners alike.

While a complete review of the voluminous number of empirical tests of trading rules in capital markets is beyond the scope of this paper, it is appropriate to identify those seminal contributions that provide a rationale for the agenda undertaken in this study. Shiller (2003) contends that up to the end of the 1970s, a naïve strategy of asset selection was supported by the body of theoretical and empirical work in financial economics. However, in the 1980s, Brozynski, Menkhoff, and Schmidt (2003) note that an influential challenge arose in the work of De Bondt and Thaler (1985), which claimed that a contrarian strategy would be profitable over a time period of several years (see also Lakonishok, Shleifer and Vishny, 1994). The 1990s saw the work of Jegadeesh and

Titman (1993) exploit momentum-based strategies for profit at horizons of around six months.[1]

These ideas, historically tested in stock markets, have also been considered in foreign exchange markets, with various studies attempting to explain the presence of excess returns. Trading rule studies, such as Sweeney (1986), Taylor and Allen (1992) and Brock, Lakonishok and LeBaron (1992) have questioned the notion of market efficiency in foreign exchange markets on the basis of return predictability. Other studies such as Kho (1996) argue that excess returns are the result of time varying risk premia and test for the presence of GARCH processes in foreign exchange returns. A further strand of literature, led by Szakmary and Mathur (1997), consider the role of central bank intervention in markets, suggesting the central banks lack incentives to profit from market fluctuations.

While the source of excess returns is up for debate, the literature overwhelmingly provides corroborating results of the profitability of trading strategies in foreign exchange markets. Important contributions by Sweeney (1986), Taylor and Allen (1992), Levich and Thomas (1993), Kho (1996), Dutt and Ghosh (1999), LeBaron (1999), Marsh (2000) and, into the new century by Okunev and White (2003), have reported excess returns using a variety of ex-ante trading rules, particularly rules based on moving average filters. However, while the foreign exchange literature is voluminous on empirical research that has defined momentum in the form of moving averages (that is, when a trading decision is the result of some form of moving average crossover), there is a paucity of research

[1] See also the update by Jegadeesh and Titman (2001).

that considers momentum-based filters as defined by Jegadeesh and Titman (1993), that is, measuring momentum as total returns over a historical formation period.

In this paper, we test the practitioner (and emerging academic) consensus that movements in foreign exchange markets are predictable. In an excellent recent survey of tests of foreign exchange market efficiency, Lewis (1995) demonstrates that the results are, at times, inconsistent and are open to important criticisms in terms of the methodological approach employed.[2] Lewis (1995) is not alone in this critique, with an important contribution by Neely, Weller and Dittmar (1997) regarding the "narrowness" of the definition of various trading strategies and resultant excess returns reported by empirical studies being open to question. We respond to the methodological challenge in this paper by employing a range of commonly employed momentum strategies (of the form of Jegadeesh and Titman, 1993) used on the dealing desks of foreign exchange traders around the world.

2. Data Collection

The dataset employed in this study consisted of the G7 countries (Canada, France, Germany, Italy, Japan, the U.K., and the U.S.) which were sourced from Global Financial Data, Inc. The data consisted of monthly observations from November 1980 to January 2004. Due to the introduction of the Euro currency on 31 December 1998 whereby the German Deutchemark, French Franc and Italian Lira currencies were fixed to the value of the Euro, the analysis in this paper is divided into two time periods. The first time period is from November 1980 through December 1998, consisting of 217 monthly return

[2] This study is structured as a detailed empirical investigation examining foreign exchange market efficiency using popular momentum strategies currently employed by practitioners. We are motivated in this empirical study to focus on the methodological and results sections of the larger study, and hence we are brief about reviewing the literature to date. For an excellent survey of this area, see Lewis (1995).

observations, and, the second period is from January 1999 through January 2004, consisting of 61 monthly return observations.[3] The dataset consisted of the monthly spot exchange rates and the three-month interbank rates of each G7 nation.

From this dataset, two types of data series were constructed. The first data series consisted of the spot monthly returns of the G7 countries. These base currency returns of each currency pair were computed as follows:

$$R_{B,t} = \frac{S_t}{S_{t-1}} - 1 \qquad [1]$$

where $R_{B,t}$ equates to the base currency return, S_t is the spot foreign exchange rate at month t and S_{t-1} equates to the spot foreign exchange rate at month $t-1$. The foreign currency spot rate returns for each currency pair of the G7 countries were then calculated. These base currency returns are returns of the domestic (base) currency per unit of foreign currency. Effectively, these calculations are a time series of monthly returns of the fluctuations of each cross rate combination of all G7 currency pairs.

The second data series comprises the first dataset of spot returns, and incorporates the interest rate differential of each currency pair. Effectively, an investor that allocates capital to a foreign currency is not only exposed to fluctuations of the spot rates between the domestic (base) currency and the foreign currency, but the investor is also exposed to

[3] The first data period ceases at December 1998 as the German Deutschemark, French Franc and Italian Lira exchange rates were fixed to form the Euro currency on 01 January 1999 at the respective exchange rates of 1 Euro equal to 1.95583 German marks, 6.55957 French Francs and 1,936.27 Italian Lire (Official Journal of the European Communities, 1998).

the interest rate differential during the investment time horizon. As this study analyses monthly returns, we assume that the investor is exposed to the one-month interest rate differential of each currency pair. The returns in the second data series were computed as follows:

$$R_{I,t} = (r_f - r_d) * \frac{1}{12} + \frac{S_t}{S_{t-1}} - 1 \qquad [2]$$

where $R_{I,t}$ equates to the interest adjusted foreign currency monthly return, r_f is the one month interest rate of the foreign currency, r_d is the one month interest rate of the domestic (i.e. base) currency, and $(r_f - r_d) * \frac{1}{12}$ equates to the monthly interest rate differential gain or loss, S_t is the spot foreign exchange rate at month t and S_{t-1} equates to the spot foreign exchange rate at month $t-1$.

Considering that Global Financial Data, Inc did not make available the historical one-month interest rate for each G7 nation, we resorted to utilising the three-month interest rates, and thus, we therefore assumed a flat yield curve in each currency from one month to three months in order to use the three month interest rate as the proxy for the one month interest rate.[4] For future reference, this second data series is referred to as the "interest-adjusted returns", representing the actual returns that investors would earn if they converted their base currencies into each foreign currency and held that currency for a one month time horizon.

[4] This approach has some standing in the literature; see Okunev and White (2003).

Tables 1 and 2 present the summary statistics for the base currency returns of each country and each respective currency pair. The descriptive statistics from Table 1 indicate that the Japanese yen clearly appreciated across all currencies while the Italian Lira depreciated across all currencies during the 1980 to 1998 period. During this period, the Jarque-Bera statistic indicates that thirty-three out of the forty-two cross rates reject the hypothesis of normally distributed returns. It is clear that the IID assumption is unreasonable when performing an analysis of spot rate returns on the G7 countries during this time period and this finding is consistent with similar findings on weekly currency data in Kho (1996). Table 2 considers the same summary statistics for the time period since the introduction of the Euro currency from January 1999 to January 2004. Contrary to Table 1, the returns in Table 2 do not reject the hypothesis of normally distributed returns with the exception of the Japanese Yen-Euro currency pair.

[Insert Tables 1 and 2 about here]

Similar to the summary statistics presented for base currency returns, Tables 3 and 4 provide the descriptive statistics of the interest-adjusted returns for the 1980 to 1998 and 1999 to 2004 time periods. The evidence provided in Tables 3 and 4 highlight that when the interest rate differential between each currency pair is considered in the total return to the investor, one can see that the losses on spot rate appreciation by Japanese investors are offset by the higher interest rate earned by holding foreign currencies. Conversely, the spot rate currency profits achieved by Italian investors were offset by the negative interest rate differential when holding those foreign currencies.[5]

[5] One may interpret this result as being consistent with the theory of interest rate parity or evidence of unbiased expectations. For a more complete discussion of this debate, see Froot and Thaler (1990).

[Insert Tables 3 and 4 about here]

Finally, the data collection process required two sets of returns to be generated. This paper defines momentum similar to Jegadeesh and Titman (1993) by measuring momentum as the total return based on a specified historical formation period. This simple momentum trading rule calculated on base currency returns can be defined as:

$$R_{MFB,t-1} = \prod_{n<t}^{n} (1 + R_{B,n}) - 1 \qquad [3]$$

where $R_{MFB,t-1}$ is the formation period return which is the total return of a foreign currency for n periods, and $\prod_{n<t}^{n} (1 + R_{B,n})$ is the sum product of n monthly base currency returns prior to time t.

While this methodology measures momentum as the total return derived from historical foreign exchange rates, we extend the definition of momentum by employing the second dataset and defining interest adjusted returns as:

$$R_{MFI,t-1} = \prod_{n<t}^{n} (1 + R_{I,n}) - 1 \qquad [4]$$

where $R_{MFI,t-1}$ is the formation period return which is the total return of a foreign currency for n periods and $\prod_{n<t}^{n} (1 + R_{I,n})$ is the sum product of n monthly interest adjusted

returns prior to time t.[6] With issues of data completed, we now explore the methodological approach used in this study.

3. Methodology

We take a four-step approach to investigating momentum in this study, comprising (a) calculating momentum returns across various look back periods; (b) examining the role of transaction costs on excess returns; (c) consolidating all look back periods into a single signal to avoid bias; and, (d) bootstrapping of results to evaluate the source of any excess returns. We consider each of these methodological tenets in the following section.

We commence with the development of the naïve trading strategies. When the momentum returns were calculated, each foreign currency was ranked from highest to lowest as defined by the historical momentum return as at the end of each formation month at period $t-1$ with respect to its base currency. The next step in this naïve trading rule was to engage in a series of strategies to create long positions in the foreign currencies with the highest momentum return and create short positions in the foreign currencies with the lowest momentum return. We develop two naïve strategies: (a) go long the foreign currency with the strongest momentum, and, an equal weighted short position in the foreign currency with the weakest momentum; (b) an equal-weighted long position of the two foreign currencies with the strongest momentum, and, an equal-weighted short position of the two foreign currencies with the weakest momentum. We

[6] The performance of a momentum strategy based on interest adjusted returns is important for three reasons. First, momentum tests defined as arithmetic average returns were evaluated by Sweeney (1986) while Okunev and White (2003) examined multiple moving averages on both spot rates and interest adjusted returns. Our contribution to this debate is that we consider this problem from a different perspective through an alternate specification of momentum which is closer to that of Jegadeesh and Titman (1993). Second, the definition of interest adjusted returns is important in the foreign currency literature as it represents the actual returns earned by investors when they allocate capital into respective foreign currencies. Finally, the momentum strategy employed in this study is simple and can be easily replicated by fund managers and currency traders alike.

calculate the momentum of these two strategies using both data sets, that is, raw spot returns and on interest adjusted returns.

The second methodological step examines the role of transaction costs on excess returns. After the profitability and statistical significance of momentum is evaluated across data sets, we then identified the two most profitable momentum strategies from each base currency and applied transaction costs to them. Transaction costs are applied as a test of the robustness of any findings in terms of applicability in the field.

As the results of any trading strategy study may be transitionary, the third methodological step attempts to avoid such bias. In order to avoid the favoured momentum look-back period or "avoid cherry picking", this study consolidated all of the momentum rankings from all the various formation periods into one consolidated test. The findings from the consolidated rankings show that statistically significant returns were garnered from the consolidation of the various look-back rankings.

Finally, with the finding of statistical significance, the paper then turns its attention to investigating why such a momentum strategy works in foreign exchange markets. We take a non-parametric approach to momentum profits, employing a conventional bootstrap technique which randomly selects currency returns which inherently avoids the presence of autocorrelation structure within the time series (by avoiding the block-bootstrap approach, any autocorrelation structure in the returns are eliminated from the simulations). We boostrap each momentum period strategy and then re-compute the consolidated strategy, testing the null hypothesis that momentum profits from the

consolidated strategy are the result of autocorrelation structure in the returns. This study finds that the autocorrelation of returns is the primary source of the excess returns.

4. Analysis

A. Preliminary Results

The results of the two momentum strategies for the G7 currencies over the 1980 to 1998 and 1999 to 2004 time periods are presented in Tables 5 to 8. The analysis measured momentum return as defined as base currency returns (raw spot returns) and interested adjusted returns. The method employed to determine the statistical significance of excess profits from these strategies was to compare these active strategies with a passive buy-and-hold foreign currency portfolio that has an equal weighted long position across the respective six alternate foreign currencies. The study employed both the standard *t*-test and the non-parametric Wilcoxon test in order to measure the statistical significance of excess returns.

[Insert Table 5 (Strategy 1 80-98) and Table 6 (Strategy 2 80-98) about here]

The results indicate that the trading strategies that measured momentum using interest adjusted returns seemed to produce higher excess returns than the same strategy using base currency returns as the measure of momentum. It seems that Strategy One tended to generate higher and more statistically significant excess returns than Strategy Two. In addition, it seems that Strategy One seems to be more profitable than Strategy Two. Finally, the results show that excess returns vary across the various formation periods of 1 to 18 months, however, shorter formation periods tend to be more consistently profitable than longer look back formation periods.

[Insert Table 7 (Strategy 1 99-04) and Table 8 (Strategy 2 99-04) about here]

The results indicate that the 1980 to 1998 time period produced statistically significance excess returns while the 1999 to 2004 time period generated lower and less statistically significance returns. This could be a function of two factors, namely, the excess returns garnered from momentum may be transitory, and, the 1999 to 2004 data series was a short data period consisting of 61 return observations only, thus making statistical inference difficult. The results clearly show that the currencies that produced the most statistically significant excess returns came from the now obsolete German, French and Italian currencies that do not exist anymore.

B. The Impact of Transaction Costs on Excess Returns

Considering that this study evaluated two trading strategies, tested two sources of momentum, eight look back formation periods and two time periods, this study selected the best two momentum strategies for each currency and estimated the impact of transaction costs. Considering that the original data returns do not conform to the assumption of normality, the method used to select the best strategies was the level of the Wilcoxon test. Table 9 presents the best two trading strategies of each currency in the 1980 to 1998 time period and assesses the impact that transaction costs has on each of these strategies. The results show how the impact of transaction costs erodes the level of excess returns and reduces the level of statistical significance from the original results which contained zero transaction costs.

[Insert Table 9 around here]

C. Momentum and its Time-Varying Effects

The results in Tables 5 through eight clearly show that the profitability of momentum is variable and depends on the currencies selected and the formation look back period selected. Critics of trading rule studies state that the process of data mining or 'cherry picking' that is introduced when selecting the best or worst performing parameter sets brings the results from such studies into question. The criticism from researchers such as Neely, Weller and Dittmar (1997) is valid as a level of bias can be introduced into the empirical research depending on the trading rule selection criteria. In order to avoid this type of bias in this study, we follow the innovative work of Okunev and White (2003) by consolidating the all the momentum rankings of all momentum look back periods in this study into one consolidated test for each currency. This consolidation similar to Okunev and White (2003) is designed to avoid bias as momentum across all the formation time period is employed under this one test. The results are summarised in Table 10.

[Insert Table 10 around here]

The results in Table 10 show two tests where the rankings from each of the various momentum look back periods were consolidated to form one consolidated ranking set and that new ranking set were back tested. Considering that the individual momentum clearly show little or no excess returns could be garnered from the 15 and 18 month momentum formation periods, this study provides two back tests, where one test include and the other excludes the 15 to 18 month formation period rankings. The results of these back tests persistently show excess returns, which are statistically significant when compared

to the passive buy-and -hold benchmark currency portfolio. Interestingly, currencies such as the US dollar and Japanese Yen, which generated little or no statistically significant excess returns on various momentum look back periods, have produced significant excess returns when the various momentum rankings are consolidated[7]. Similar to the individual results, the most significant excess returns in the 1980 to 1998 period were generated from the three European currencies that no longer exist. Interestingly, over the 1999 to 2004 period, Table 10 shows that the consolidated ranking back test generates high levels of statistically significant excess returns. The puzzling feature of the 1999-2004 back test is that individual momentum tests did not produce statistically significant excess returns however, when these rankings were consolidated into a full test of all the formation period rankings, the results exhibited in Table 10 shows that the strategies are highly profitable at a nil transaction cost basis.

D. The Source of Excess Returns

The source of excess returns in foreign currency markets is a much debated issue with various theories that attempt to explain this market efficiency anomaly. We take a similar approach to Brock *et. al*., (1992) and employ the Efron (1979) non-parametric bootstrap approach to this problem. In order to measure the importance of historical information to the profitable momentum strategies in this study, we replicate the foreign currency returns in a bootstrap simulation; however, we impose the absence of autocorrelation of returns. The results of the consolidated Strategy One on simulated data is presented in Table 11.

[7] The USD back test generated a Wilcoxon test of 1.635, which is statistically significant at the 10% level and just outside the 5% significance level. All other Wilcoxon tests are significant at the 5% level.

[Insert Table 11 around here]

The simulation results in Table 11 clearly show that the momentum strategies in this study do not generate excess returns on simulated bootstrap data that assumes zero autocorrelation of returns. The results also indicate that excess returns caused by a bias due to the interest rate differential between currencies would have flowed into these simulation results and caused them to generate excess returns. This clearly has not been the case in this analysis. One can conclude that the excess returns garnered from the momentum strategy in this study is caused by the historical information content in the foreign exchange returns of the original data. The standard deviations and information ratios of the various results in this study clearly indicate that this strategy is not risk free. That is, excess returns can be generated; however, the investor must be exposed to volatility of returns in order to achieve this. Such a result conforms to standard finance theory.

5. Concluding Comments

We make a number of concluding comments, as distinct from definitive conclusions, to reflect the imperative for ongoing research in this field. First, momentum, as defined by Jegadeesh and Titman (1993), exists in foreign exchange markets. Second, momentum appears to be largely transitory, albeit, skewed towards short look back or formation periods. Third, when evaluating momentum strategies in light of transaction costs, the ability for traders to garner excess returns after fees is diminished – in short, large trading institutions (characterised by the lowest possible transactions costs) may be able to exploit such opportunities, however, corporate and retail clients (characterised by

relatively high costs) are limited in their ability to achieve such returns. Fourth, when various look back periods are consolidated into a single signal, we find statistically significant excess returns. From a trading perspective, we would discourage the use of single formation periods by traders, suggesting that an all encompassing measure of momentum may mitigate the transitory nature of such profits. Finally, the bootstrap of the currency returns garnered from the consolidated signal clearly shows the presence of memory is required to generate such returns. One area for future research in this field is to develop more advanced definitions of momentum, as this study employed a relatively simple strategy through which to test momentum. The development of such techniques, and the investigation of the sources of potential excess returns resulting from such strategies, is an important issue left to further studies.

Reference List

Brock, W., J. Lakonishok, and B. LeBaron, 1992, Simple technical trading rules and the stochastic properties of stock returns, *Journal of Finance* 47, 1731-1764.

Brozynski, T., L. Menkhoff, and U. Schmidt, 2003, The use of momentum, contrarian and buy-&-hold strategies: Survey evidence from fund managers, *Mimeo*, University of Hannover (December).

De Bondt, W. and R. Thaler, 1985, Does the stock market overreact? *Journal of Finance* 40, 793-808

Dutt, S., and D. Ghosh, 1999, A note on the foreign exchange market efficiency hypothesis, *Journal of Economics and Finance* 23, 157-161.

Efron, B., 1979, Bootstrap methods: Another look at the jack-knife, *The Annals of Statistics* 7, 1-26.

Fama, E., 1970, Efficient capital markets, *Journal of Finance* 25, 383-417

Froot, K., and R. Thaler, 1990, Anomalies: Foreign exchange, *Journal of Economic Perspectives* 4, 179-192.

Jegadeesh, M., and S. Titman, 1993, Returns to buying winners and selling losers: Implications for stock market efficiency, *Journal of Finance* 48, 65-91.

Jegadeesh, M., and S. Titman, 2001, Profitability of momentum strategies: An evaluation of alternative explanations, *Journal of Finance* 56, 699-720.

Kho, B., 1996, Time-varying risk premia, volatility, and technical trading rule profits: Evidence from foreign exchange futures markets, *Journal of Financial Economics* 41, 249-290.

Lakonishok, J., A. Shleifer, and R. Vishny, 1994, Contrarian investment, extrapolation, and risk, *Journal of Finance* 49, 1541-1578

LeBaron, B., 1999, Technical trading rule profitability and foreign exchange intervention, *Journal of International Economics* 49, 125-143

Levich, R., and L. Thomas, 1993, The significance of technical trading-rule profits in the foreign exchange market: A bootstrap approach, *Journal of International Money and Finance* 12, 451-474

Lewis, K. 1995, Puzzles in international financial markets, in *Handbook of International Economics, Vol. 3*, edited by G. Grossman and K. Rogoff, (New York: North Holland).

Marsh, I., 2000, High-frequency Markov switching models in the foreign exchange market, *Journal of Forecasting* 19, 123-134.

Neeley, C., P. Weller, and R. Dittmar, Is technical analysis profitable in foreign exchange markets? A genetic programming approach, *Journal of Financial and Quantitative Analysis* 32, 405-426

Official Journal of the European Communities, 1998, *Council Regulation (EC) No. 2866/98*, L359, Volume 41, December 31st.

Okunev, J., and D. White, 2003, Do momentum-based strategies still work in foreign currency markets? *Journal of Financial and Quantitative Analysis* 38, 425-447.

Shiller, R., 2003, From efficient markets theory to behavioural finance, *Journal of Economic Perspectives* 17, 83-104

Sweeney, R., 1986, Beating the foreign exchange market, *Journal of Finance* 41, 163-182.

Szakmary, A., and I. Mathur, 1997, Central bank intervention and trading profit rules in foreign exchange markets, *Journal of International Money and Finance* 16, 513-535

Taylor, M., and H. Allen, 1992, The use of technical analysis in the foreign exchange market, *Journal of International Money and Finance* 11, 304-314

TABLE 1
Descriptive Statistics (Base Currency Returns)

	U.S.A.	U.K.	Canada	Germany	France	Italy	Japan	Equal
U.S.A.								
Mean Ret. (%)	NA	-0.108	-0.107	0.124	-0.049	-0.221	0.368	0.001
Median Ret. (%)	NA	-0.233	-0.075	0.123	0.119	-0.072	-0.127	0.040
Std. Dev. (%)	NA	3.322	1.290	3.354	3.277	3.194	3.741	2.468
t-Stat.	NA	-0.480	-1.221	0.543	-0.220	-1.017	1.447	0.006
Infor. Ratio	NA	-0.033	-0.083	0.037	-0.015	-0.069	0.098	0.000
Jarque-Bera	NA	40.212**	12.265**	0.128	1.495	13.945**	64.520**	0.063
U.K.								
Mean Ret. (%)	0.219	NA	0.102	0.264	0.093	-0.075	0.530	0.189
Median Ret. (%)	0.234	NA	0.340	0.109	0.090	-0.021	-0.009	0.210
Std. Dev. (%)	3.349	NA	3.317	2.590	2.568	2.592	3.713	2.335
t-Stat.	0.963	NA	0.455	1.503	0.535	-0.429	2.102*	1.192
Infor. Ratio	0.065	NA	0.031	0.102	0.036	-0.029	0.143	0.081
Jarque-Bera	47.331**	NA	45.218**	20.116**	24.578**	3.635	216.449**	47.600**
Canada								
Mean Ret. (%)	0.124	0.006	NA	0.242	0.068	-0.105	0.488	0.137
Median Ret. (%)	0.075	-0.339	NA	-0.023	0.061	-0.224	-0.091	-0.028
Std. Dev. (%)	1.299	3.290	NA	3.431	3.345	3.207	3.864	2.534
t-Stat.	1.403	0.027	NA	1.037	0.301	-0.484	1.860	0.797
Infor. Ratio	0.095	0.002	NA	0.070	0.020	-0.033	0.126	0.054
Jarque-Bera	17.578**	22.701**	NA	0.228	0.326	1.370	71.261**	0.267
Germany								
Mean Ret. (%)	-0.011	-0.198	-0.124	NA	-0.166	-0.323	0.285	-0.089
Median Ret. (%)	-0.123	-0.109	0.023	NA	-0.039	-0.104	-0.090	0.011
Std. Dev. (%)	3.366	2.560	3.440	NA	0.904	1.804	3.292	1.822
t-Stat.	-0.050	-1.138	-0.531	NA	-2.703**	-2.634**	1.273	-0.723
Infor. Ratio	-0.003	-0.077	-0.036	NA	-0.184	-0.179	0.086	-0.049
Jarque-Bera	2.803	9.200**	3.416	NA	2742.385**	1987.114**	95.045**	0.740
France								
Mean Ret. (%)	0.157	-0.028	0.043	0.175	NA	-0.154	0.455	0.108
Median Ret. (%)	-0.119	-0.090	-0.061	0.039	NA	-0.046	0.098	0.019
Std. Dev. (%)	3.312	2.557	3.366	0.935	NA	1.717	3.293	1.756
t-Stat.	0.698	-0.161	0.190	2.752**	NA	-1.324	2.037*	0.906
Infor. Ratio	0.047	-0.011	0.013	0.187	NA	-0.090	0.138	0.062
Jarque-Bera	7.475*	14.040**	3.070	3331.289**	NA	3639.509**	78.863**	18.889**

Italy								
No. of Obs.	217	217	217	217	217	NA	217	217
Mean Ret. (%)	0.325	0.143	0.209	0.358**	0.186	NA	0.638*	0.310*
Median Ret. (%)	0.072	0.021	0.225	0.104	0.046	NA	0.148	0.180
Std. Dev. (%)	3.267	2.607	3.245	1.904	1.818	NA	3.678	1.988
t-Stat.	1.465	0.807	0.949	2.768**	1.504	NA	2.555*	2.295*
Infor. Ratio	0.099	0.055	0.064	0.188	0.102	NA	0.173	0.156
Jarque-Bera	47.856**	6.103*	6.980*	3640.267**	6717.516**	NA	265.174**	800.425**
Japan								
Mean Ret. (%)	-0.232	-0.397	-0.343	-0.179	-0.349	-0.507*	NA	-0.335
Median Ret. (%)	0.127	0.009	0.091	0.090	-0.098	-0.148	NA	-0.044
Std. Dev. (%)	3.621	3.539	3.740	3.198	3.195	3.481	NA	2.974
t-Stat.	-0.944	-1.653	-1.350	-0.827	-1.610	-2.148*	NA	-1.658
Infor. Ratio	-0.064	-0.112	-0.092	-0.056	-0.109	-0.146	NA	-0.113
Jarque-Bera	22.341**	89.713**	24.992**	32.351**	25.589**	107.728**	NA	94.437**

*The dataset consists of monthly returns of individual G7 currency pairs from November 1980 to December 1998. The time period consists of 217 monthly return observations. The Equal column is the currency return based on an Equal weighting allocated to the six respective foreign currencies. The Jarque-Bera test of normality is based on Skewness and excess kurtosis and is Chi-square distributed with two degrees of freedom. Statistical significance at the 1% level and 5% level is denoted by ** and *, respectively.*

TABLE 2
Descriptive Statistics (Base Currency Returns)

	U.S.A.	U.K.	Canada	Euro	Japan	Equal^	Equal^^
U.S.A.							
Mean Ret. (%)	NA	0.185	0.254	0.144	0.153	0.171	0.184
Median Ret. (%)	NA	-0.093	0.166	-0.345	-0.088	-0.153	-0.002
Std. Dev. (%)	NA	2.228	1.857	3.020	2.888	2.134	1.809
t-Stat.	NA	0.649	1.067	0.373	0.413	0.624	0.794
Infor. Ratio	NA	0.083	0.137	0.048	0.053	0.080	0.102
Jarque-Bera	NA	1.042	0.220	2.465	0.039	1.580	0.515
U.K.							
Mean Ret. (%)	-0.137	NA	0.109	-0.038	-0.002	-0.024	-0.017
Median Ret. (%)	0.093	NA	0.368	-0.012	-0.371	-0.057	-0.001
Std. Dev. (%)	2.210	NA	2.607	2.185	3.102	1.720	1.842
t-Stat.	-0.483	NA	0.327	-0.135	-0.005	-0.108	-0.071
Infor. Ratio	-0.062	NA	0.042	-0.017	-0.001	-0.014	-0.009
Jarque-Bera	0.749	NA	0.274	2.164	0.518	7.935	2.975
Canada							
Mean Ret. (%)	-0.219	-0.042	NA	-0.094	-0.077	-0.103	-0.108
Median Ret. (%)	-0.166	-0.366	NA	-0.559	-0.329	-0.688	-0.415
Std. Dev. (%)	1.854	2.619	NA	2.960	3.138	2.243	2.059
t-Stat.	-0.924	-0.125	NA	-0.247	-0.191	-0.360	-0.409
Infor. Ratio	-0.118	-0.016	NA	-0.032	-0.024	-0.046	-0.052
Jarque-Bera	0.561	1.000	NA	2.410	1.505	3.731	4.940
Euro							
Mean Ret. (%)	-0.053	0.087	0.182	NA	0.069	0.046	0.023
Median Ret. (%)	0.336	-0.007	0.562	NA	-0.157	0.080	0.068
Std. Dev. (%)	2.983	2.175	2.944	NA	3.346	1.588	1.791
t-Stat.	-0.140	0.311	0.482	NA	0.161	0.225	0.102
Infor. Ratio	-0.018	0.040	0.062	NA	0.021	0.029	0.013
Jarque-Bera	1.626	1.202	1.905	NA	5.720	0.385	0.502
Japan							
Mean Ret. (%)	-0.070	0.097	0.173	0.043	NA	0.055	0.028
Median Ret. (%)	0.088	0.372	0.330	0.160	NA	0.172	0.008
Std. Dev. (%)	2.893	3.122	3.119	3.349	NA	2.821	2.846
t-Stat.	-0.190	0.243	0.433	0.101	NA	0.152	0.077
Infor. Ratio	-0.024	0.031	0.055	0.013	NA	0.019	0.010
Jarque-Bera	0.602	2.160	0.348	10.079**	NA	4.588	4.695

*The dataset consists of monthly returns of individual G7 currency pairs from January 1999 to January 2004. The time period consists of 61 monthly return observations. The Equal^ column is the currency return based on an equal weighting allocated to the six respective foreign currencies whereby the Euro represents the currencies of Germany, France and Italy The Equal^^ column is the currency return based on an equal weighting allocated to four respective foreign currencies whereby the Euro represents one currency only The Jarque-Bera test of normality is based on skewness and excess kurtosis and is Chi-square distributed with two degrees of freedom. Statistical significance at the 1% level and 5% level is denoted by ** and *, respectively.*

TABLE 3
Descriptive Statistics (Interest Adjusted Currency Returns)

	U.S.A.	U.K.	Canada	Germany	France	Italy	Japan	Equal
U.S.A.								
Mean Ret. (%)	NA	0.117	0.067	0.040	0.133	0.247	0.131	0.122
Median Ret. (%)	NA	-0.029	0.101	0.127	0.350	0.531	-0.332	0.128
Std. Dev. (%)	NA	3.366	1.315	3.383	3.299	3.184	3.785	2.495
t-Stat.	NA	0.511	0.749	0.176	0.592	1.143	0.508	0.722
Infor. Ratio	NA	0.035	0.051	0.012	0.040	0.078	0.035	0.049
Jarque-Bera	NA	34.594**	6.270*	0.076	1.121	8.253*	53.279**	0.074
U.K.								
Mean Ret. (%)	-0.006	NA	0.051	-0.044	0.050	0.167	0.068	0.048
Median Ret. (%)	0.033	NA	0.233	-0.162	0.059	0.226	-0.525	0.139
Std. Dev. (%)	3.391	NA	3.365	2.600	2.589	2.600	3.740	2.365
t-Stat.	-0.026	NA	0.225	-0.248	0.285	0.949	0.268	0.298
Infor. Ratio	-0.002	NA	0.015	-0.017	0.019	0.064	0.018	0.020
Jarque-Bera	38.632**	NA	38.805**	23.425**	27.585**	4.504	203.649**	51.897**
Canada								
Mean Ret. (%)	-0.050	0.057	NA	-0.015	0.076	0.189	0.077	0.056
Median Ret. (%)	-0.101	-0.230	NA	-0.276	-0.058	0.042	-0.414	-0.104
Std. Dev. (%)	1.323	3.338	NA	3.456	3.360	3.199	3.898	2.556
t-Stat.	-0.557	0.252	NA	-0.065	0.334	0.868	0.291	0.321
Infor. Ratio	-0.038	0.017	NA	-0.004	0.023	0.059	0.020	0.022
Jarque-Bera	9.650**	19.281**	NA	0.215	0.241	0.974	63.856**	0.158
Germany								
Mean Ret. (%)	0.072	0.110	0.133	NA	0.099	0.228	0.131	0.129
Median Ret. (%)	-0.127	0.162	0.277	NA	0.189	0.367	-0.236	0.233
Std. Dev. (%)	3.395	2.570	3.465	NA	0.884	1.796	3.303	1.830
t-Stat.	0.311	0.631	0.565	NA	1.644	1.872	0.583	1.036
Infor. Ratio	0.021	0.043	0.038	NA	0.112	0.127	0.040	0.070
Jarque-Bera	2.354	11.660**	3.072	NA	2000.816**	1815.318**	87.697**	0.810
France								
Mean Ret. (%)	-0.025	0.015	0.036	-0.090	NA	0.132	0.037	0.018
Median Ret. (%)	-0.348	-0.059	0.058	-0.189	NA	0.219	-0.268	-0.105
Std. Dev. (%)	3.334	2.577	3.379	0.914	NA	1.722	3.285	1.755
t-Stat.	-0.109	0.087	0.156	-1.450	NA	1.128	0.166	0.147
Infor. Ratio	-0.007	0.006	0.011	-0.098	NA	0.077	0.011	0.010
Jarque-Bera	6.324*	14.826**	2.820	2502.609**	NA	3015.767**	86.683**	17.059**

Italy								
Mean Ret. (%)	-0.143	-0.100	-0.085	-0.193	-0.101	NA	-0.067	-0.115
Median Ret. (%)	-0.531	-0.226	-0.041	-0.367	-0.219	NA	-0.532	-0.230
Std. Dev. (%)	3.254	2.613	3.235	1.895	1.820	NA	3.659	1.961
t-Stat.	-0.646	-0.565	-0.386	-1.500	-0.814	NA	-0.269	-0.861
Infor. Ratio	-0.044	-0.038	-0.026	-0.102	-0.055	NA	-0.018	-0.058
Jarque-Bera	32.892**	5.744	5.736	3379.474**	5723.731**	NA	262.784**	675.382**
Japan								
Mean Ret. (%)	0.005	0.065	0.068	-0.026	0.069	0.197	NA	0.063
Median Ret. (%)	0.332	0.525	0.415	0.236	0.268	0.532	NA	0.305
Std. Dev. (%)	3.667	3.568	3.776	3.210	3.186	3.462	NA	2.988
t-Stat.	0.019	0.266	0.265	-0.118	0.320	0.839	NA	0.311
Infor. Ratio	0.001	0.018	0.018	-0.008	0.022	0.057	NA	0.021
Jarque-Bera	17.373**	84.497**	21.513**	28.944**	28.901**	107.433**	NA	89.498**

The dataset consists of monthly returns of individual G7 currency pairs from November 1980 to December 1998. The time period consists of 217 monthly return observations. The Equal column is the currency return based on an equal weighting allocated to the six respective foreign currencies. The Jarque-Bera test of normality is based on skewness and excess kurtosis and is Chi-square distributed with two degrees of freedom.
*Statistical significance at the 1% level and 5% level is denoted by ** and *, respectively.*

TABLE 4
Descriptive Statistics (Interest Adjusted Currency Returns)

	U.S.A.	U.K.	Canada	Euro	Japan	Equal^	Equal^^
U.S.A.							
Mean Ret. (%)	NA	0.313	0.303	0.134	-0.112	0.156	0.162
Median Ret. (%)	NA	-0.011	0.197	-0.287	-0.382	-0.106	0.047
Std. Dev. (%)	NA	2.258	1.876	3.064	2.912	2.173	1.847
t-Stat.	NA	1.081	1.261	0.341	-0.301	0.562	0.683
Infor. Ratio	NA	0.138	0.161	0.044	-0.038	0.072	0.087
Jarque-Bera	NA	1.139	0.165	2.353	0.089	1.518	0.521
U.K.							
Mean Ret. (%)	-0.264	NA	0.031	-0.175	-0.394	-0.187	-0.198
Median Ret. (%)	0.012	NA	0.320	-0.105	-0.734	-0.242	-0.174
Std. Dev. (%)	2.240	NA	2.616	2.203	3.100	1.725	1.847
t-Stat.	-0.920	NA	0.093	-0.622	-0.992	-0.845	-0.839
Infor. Ratio	-0.118	NA	0.012	-0.080	-0.127	-0.108	-0.107
Jarque-Bera	0.873	NA	0.279	2.040	0.540	7.752*	2.957
Canada							
Mean Ret. (%)	-0.269	0.036	NA	-0.153	-0.391	-0.175	-0.192
Median Ret. (%)	-0.196	-0.319	NA	-0.688	-0.663	-0.663	-0.526
Std. Dev. (%)	1.873	2.628	NA	2.984	3.141	2.255	2.067
t-Stat.	-1.120	0.107	NA	-0.402	-0.972	-0.607	-0.725
Infor. Ratio	-0.143	0.014	NA	-0.051	-0.124	-0.078	-0.093
Jarque-Bera	0.389	1.011	NA	2.389	1.290	3.584	4.737
Euro							
Mean Ret. (%)	-0.045	0.222	0.239	NA	-0.187	0.033	0.048
Median Ret. (%)	0.287	0.105	0.693	NA	-0.440	0.014	0.018
Std. Dev. (%)	3.022	2.187	2.964	NA	3.345	1.606	2.406
t-Stat.	-0.117	0.794	0.631	NA	-0.438	0.161	0.156
Infor. Ratio	-0.015	0.102	0.081	NA	-0.056	0.021	0.020
Jarque-Bera	1.610	1.187	1.934	NA	5.568	0.421	0.425
Japan							
Mean Ret. (%)	0.194	0.489	0.487	0.297	NA	0.349	0.369
Median Ret. (%)	0.382	0.736	0.664	0.440	NA	0.489	-0.066
Std. Dev. (%)	2.919	3.120	3.123	3.351	NA	2.820	2.725
t-Stat.	0.520	1.224	1.218	0.693	NA	0.967	1.058
Infor. Ratio	0.067	0.157	0.156	0.089	NA	0.124	0.135
Jarque-Bera	0.757	2.257	0.288	10.243**	NA	4.798	1.678

*The dataset consists of monthly returns of individual G7 currency pairs from January 1999 to January 2004. The time period consists of 61 monthly return observations. The Equal^ column is the currency return based on an equal weighting allocated to the six respective foreign currencies whereby the Euro represents the currencies of Germany, France and Italy The Equal^^ column is the currency return based on an equal weighting allocated to four respective foreign currencies whereby the Euro represents one currency only The Jarque-Bera test of normality is based on skewness and excess kurtosis and is Chi-square distributed with two degrees of freedom. Statistical significance at the 1% level and 5% level is denoted by ** and *, respectively.*

TABLE 5
Strategy One Results - 1980 to 1998

Panel A: Source of Momentum - Raw Currency Returns

	Momentum Formation Period (in months):	**1**	**2**	**3**	**6**	**9**	**12**	**15**	**18**
CANADA	Mean Ret.(%) - Active Strategy	0.531	0.516	0.485	0.264	0.425	0.217	0.037	-0.141
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.055	0.077	0.086	0.127	0.160	0.152	0.168	0.171
	Excess Return (%)	0.476	0.439	0.399	0.137	0.265	0.065	-0.131	-0.312
	Std. Dev.(%) - Active Strategy	3.259	3.412	3.471	3.709	3.713	3.569	3.643	3.792
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.561	2.547	2.550	2.543	2.543	2.559	2.572	2.580
	Infor. Ratio	0.109	0.103	0.092	0.031	0.059	0.015	-0.030	-0.069
	Prob > Passive Equal Weighted Portfolio (%)	56.02%	54.88%	55.61%	56.40%	60.58%	57.07%	51.98%	50.75%
	: paired t-test	1.607	1.513	1.352	0.451	0.845	0.214	-0.423	-0.974
	: Wilcoxon test	1.974*	1.621	1.820	1.111	1.502	0.886	0.119	-0.640
U.K.	Mean Ret.(%) - Active Strategy	0.398	0.392	0.482	0.490	0.730	0.506	0.104	0.048
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.055	0.068	0.039	0.039	-0.008	0.002	-0.002	-0.007
	Excess Return (%)	0.343	0.324	0.443	0.451	0.738**	0.504	0.107	0.055
	Std. Dev.(%) - Active Strategy	3.248	3.298	3.283	3.425	3.358	3.604	3.647	3.430
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.368	2.366	2.334	2.345	2.315	2.296	2.311	2.325
	Infor. Ratio	0.090	0.081	0.113	0.111	0.183	0.116	0.024	0.013
	Prob > Passive Equal Weighted Portfolio (%)	52.31%	52.09%	50.47%	54.03%	57.21%	56.10%	50.99%	47.74%
	: paired t-test	1.330	1.187	1.647	1.617	2.644**	1.666	0.341	0.183
	: Wilcoxon test	1.759*	1.40	1.973*	1.841*	3.105**	2.550**	1.060	0.323
U.S.A.	Mean Ret.(%) - Active Strategy	0.269	0.351	0.485	0.410	0.517	0.130	0.046	0.028
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.122	0.144	0.155	0.193	0.219	0.192	0.230	0.237
	Excess Return (%)	0.147	0.207	0.330	0.217	0.298	-0.062	-0.185	-0.209
	Std. Dev.(%) - Active Strategy	3.216	3.288	3.509	3.399	3.353	3.534	3.525	3.393
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.501	2.486	2.487	2.474	2.468	2.473	2.468	2.473
	Infor. Ratio	0.035	0.050	0.076	0.053	0.071	-0.014	-0.042	-0.051
	Prob > Passive Equal Weighted Portfolio (%)	48.6%	45.6%	51.4%	49.8%	54.8%	53.7%	49.0%	45.2%
	: paired t-test	0.511	0.735	1.117	0.773	1.023	-0.202	-0.598	-0.717
	: Wilcoxon test	0.735	0.94	1.251	1.178	1.538	0.544	-0.130	-0.533
JAPAN	Mean Ret.(%) - Active Strategy	0.339	0.471	0.380	0.309	0.408	0.330	0.022	-0.130
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.092	0.101	0.100	0.090	0.085	0.088	0.056	0.035
	Excess Return (%)	0.247	0.370	0.279	0.220	0.322	0.243	-0.034	-0.165
	Std. Dev.(%) - Active Strategy	3.019	3.132	3.269	3.337	3.383	3.267	3.408	3.333
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.963	2.967	2.974	2.993	2.996	2.978	2.986	2.981
	Infor. Ratio	0.056	0.083	0.061	0.047	0.068	0.052	-0.007	-0.035
	Prob > Passive Equal Weighted Portfolio (%)	46.76%	48.84%	47.66%	50.71%	51.44%	51.22%	48.51%	48.24%
	: paired t-test	0.827	1.215	0.894	0.689	0.984	0.748	-0.101	-0.495
	: Wilcoxon test	0.306	0.79	0.659	0.91	1.329	1.079	0.009	-0.481

GERMANY	Mean Ret.(%) - Active Strategy	0.526	0.350	0.493	0.470	0.621	0.375	0.063	0.071
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.112	0.089	0.098	0.080	0.073	0.098	0.089	0.099
	Excess Return (%)	0.413	0.261	0.395	0.390	0.548*	0.276	-0.026	-0.028
	Std. Dev.(%) - Active Strategy	3.221	3.510	3.593	3.522	3.478	3.602	3.691	3.522
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.818	1.790	1.789	1.787	1.799	1.775	1.784	1.794
	Infor. Ratio	0.117	0.066	0.099	0.095	0.138	0.066	-0.006	-0.007
	Prob > Passive Equal Weighted Portfolio (%)	50.5%	48.4%	51.4%	54.0%	57.7%	55.6%	52.0%	50.8%
	:paired t-test	1.719	0.973	1.450	1.376	1.996*	0.951	-0.086	-0.096
	:Wilcoxon test	1.825*	1.534	2.043*	2.218*	2.802**	2.133*	0.515	-0.112
FRANCE	Mean Ret.(%) - Active Strategy	0.519	0.435	0.484	0.483	0.562	0.266	-0.024	0.003
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.006	-0.015	-0.018	-0.040	-0.042	-0.042	-0.050	-0.045
	Excess Return (%)	0.513*	0.450	0.502	0.523	0.604	0.308	0.025	0.048
	Std. Dev.(%) - Active Strategy	3.226	3.424	3.488	3.568	3.535	3.582	3.693	3.518
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.751	1.725	1.729	1.724	1.734	1.705	1.716	1.724
	Infor. Ratio	0.145	0.113	0.127	0.128	0.152	0.076	0.006	0.012
	Prob > Passive Equal Weighted Portfolio (%)	56.5%	53.5%	54.2%	57.8%	57.7%	57.6%	53.0%	49.2%
	:paired t-test	2.125*	1.664	1.864	1.858	2.198*	1.085	0.088	0.171
	:Wilcoxon test	2.472**	2.022*	2.346**	3.187**	3.185**	2.303*	0.834	0.289
ITALY	Mean Ret.(%) - Active Strategy	0.326	0.475	0.452	0.528	0.522	0.377	0.095	0.080
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.124	-0.147	-0.145	-0.172	-0.171	-0.177	-0.175	-0.172
	Excess Return (%)	0.451	0.622	0.597	0.699	0.693	0.554	0.270	0.252
	Std. Dev.(%) - Active Strategy	3.292	3.525	3.453	3.464	3.536	3.642	3.657	3.615
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.960	1.937	1.941	1.938	1.952	1.950	1.960	1.971
	Infor. Ratio	0.122	0.154	0.149	0.180	0.179	0.135	0.066	0.063
	Prob > Passive Equal Weighted Portfolio (%)	54.6%	57.7%	56.1%	58.8%	59.1%	61.0%	57.9%	55.3%
	:paired t-test	1.790	2.265*	2.184*	2.615**	2.587**	1.940	0.932	0.887
	:Wilcoxon test	2.190*	2.972**	3.099**	3.845**	3.709**	3.772**	2.266*	1.514

*Table 5 presents the results of Strategy One back tested over various formation look back periods (from 1 to 18 months) utlising raw currency returns as the source of momentum. Excess return refers to profits generated by the strategy which are greater than the passive buy-and-hold equal weighted portfolio of the respective six foreign currencies. The parametric paired t-test and the non-parametric Wilcoxon test is shown to test the statistical significance of the excess returns relative to the passive equal weighted long only portfolio, ** and * indicate statistical significance at the 1% and 5% levels, respectively.*

TABLE 5
Strategy One Results- 1980 to 1998

Panel B: Source of Momentum- Interest Adjusted Returns

	Momentum Formation Period (in months):	**1**	**2**	**3**	**6**	**9**	**12**	**15**	**18**
CANADA	Mean Ret.(%) - Active Strategy	0.728	0.593	0.647	0.505	0.298	0.388	0.153	0.142
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.055	0.077	0.086	0.127	0.160	0.152	0.168	0.171
	Excess Return (%)	0.673	0.516	0.561	0.378	0.138	0.236	-0.015	-0.030
	Std. Dev.(%) - Active Strategy	3.340	3.563	3.526	3.765	3.899	3.990	3.927	3.921
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.561	2.547	2.550	2.543	2.543	2.559	2.572	2.580
	Infor. Ratio	0.156	0.119	0.130	0.083	0.030	0.049	-0.003	-0.006
	Prob > Passive Equal Weighted Portfolio (%)	58.33%	55.35%	58.41%	58.29%	61.06%	61.95%	58.91%	55.78%
	: paired t-test	2.290*	1.745	1.897	1.208	0.427	0.698	-0.044	-0.089
	: Wilcoxon test	2.854**	2.257*	2.678*	2.192*	1.637	2.105*	1.075	0.775
U.K.	Mean Ret.(%) - Active Strategy	0.514	0.549	0.699	0.505	0.409	0.572	0.244	0.044
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.055	0.068	0.039	0.039	-0.008	0.002	-0.002	-0.007
	Excess Return (%)	0.459	0.481	0.660*	0.466	0.416	0.570	0.246	0.051
	Std. Dev.(%) - Active Strategy	3.240	3.586	3.563	3.659	3.861	3.882	3.781	3.961
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.368	2.366	2.334	2.345	2.315	2.296	2.311	2.325
	Infor. Ratio	0.120	0.113	0.154	0.104	0.087	0.120	0.052	0.010
	Prob > Passive Equal Weighted Portfolio (%)	53.70%	53.49%	55.61%	55.92%	56.73%	59.02%	54.46%	52.26%
	: paired t-test	1.763	1.650	2.250*	1.508	1.259	1.722	0.741	0.147
	: Wilcoxon test	2.316*	2.216*	3.062**	2.220*	2.568**	3.546**	2.037*	1.196
U.S.A.	Mean Ret.(%) - Active Strategy	0.499	0.432	0.646	0.622	0.277	0.334	0.132	0.104
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.122	0.144	0.155	0.193	0.219	0.192	0.230	0.237
	Excess Return (%)	0.377	0.288	0.491	0.429	0.058	0.143	-0.098	-0.133
	Std. Dev.(%) - Active Strategy	3.330	3.462	3.611	3.445	3.820	3.876	3.777	3.843
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.501	2.486	2.487	2.474	2.468	2.473	2.468	2.473
	Infor. Ratio	0.085	0.067	0.109	0.102	0.013	0.030	-0.021	-0.028
	Prob > Passive Equal Weighted Portfolio (%)	51.85%	46.05%	55.14%	53.08%	56.25%	57.56%	53.47%	52.76%
	: paired t-test	1.245	0.989	1.600	1.484	0.181	0.430	-0.298	-0.397
	: Wilcoxon test	1.814*	1.390	2.021*	2.228*	1.366	1.782*	0.737	0.425
JAPAN	Mean Ret.(%) - Active Strategy	0.544	0.555	0.554	0.438	0.426	0.388	0.180	0.148
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.092	0.101	0.100	0.090	0.085	0.088	0.056	0.035
	Excess Return (%)	0.452	0.454	0.454	0.348	0.340	0.300	0.123	0.113
	Std. Dev.(%) - Active Strategy	3.021	3.257	3.322	3.405	3.465	3.323	3.347	3.388
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.963	2.967	2.974	2.993	2.996	2.978	2.986	2.981
	Infor. Ratio	0.101	0.100	0.099	0.075	0.072	0.066	0.027	0.025
	Prob > Passive Equal Weighted Portfolio (%)	49.07%	48.37%	50.47%	51.18%	50.00%	51.22%	50.99%	50.75%
	: paired t-test	1.486	1.473	1.444	1.095	1.034	0.944	0.388	0.375
	: Wilcoxon test	1.168	1.30	1.496	1.505	1.474	1.376	0.675	0.549

GERMANY	Mean Ret.(%) - Active Strategy	0.558	0.600	0.726	0.745	0.341	0.421	0.172	0.060
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.112	0.089	0.098	0.080	0.073	0.098	0.089	0.099
	Excess Return (%)	0.446	0.511	0.628*	0.665*	0.268	0.323	0.083	-0.039
	Std. Dev.(%) - Active Strategy	3.317	3.580	3.535	3.546	3.872	3.839	3.834	4.034
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.818	1.790	1.789	1.787	1.799	1.775	1.784	1.794
	Infor. Ratio	0.124	0.125	0.160	0.165	0.061	0.074	0.019	-0.008
	Prob > Passive Equal Weighted Portfolio (%)	50.93%	52.56%	56.07%	57.35%	58.65%	59.02%	57.43%	53.77%
	: paired t-test	1.828	1.837	2.340*	2.398*	0.877	1.059	0.267	-0.118
	: Wilcoxon test	2.258*	2.495**	2.959**	3.444**	2.581**	3.007**	1.796*	1.138
FRANCE	Mean Ret.(%) - Active Strategy	0.677	0.549	0.726	0.685	0.455	0.411	0.126	-0.034
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.006	-0.015	-0.018	-0.040	-0.042	-0.042	-0.050	-0.045
	Excess Return (%)	0.671**	0.564*	0.744**	0.725**	0.497	0.452	0.176	0.011
	Std. Dev.(%) - Active Strategy	3.279	3.599	3.551	3.641	3.925	3.929	3.907	3.949
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.751	1.725	1.729	1.724	1.734	1.705	1.716	1.724
	Infor. Ratio	0.183	0.137	0.190	0.180	0.116	0.105	0.040	0.002
	Prob > Passive Equal Weighted Portfolio (%)	58.80%	54.88%	61.68%	63.51%	61.54%	61.95%	56.93%	53.77%
	: paired t-test	2.683**	2.011*	2.784**	2.613**	1.666	1.509	0.575	0.034
	: Wilcoxon test	3.518**	2.766**	3.631**	4.182**	3.341**	3.470**	1.960*	1.374
ITALY	Mean Ret.(%) - Active Strategy	0.508	0.609	0.775	0.735	0.448	0.509	0.248	0.194
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.124	-0.147	-0.145	-0.172	-0.171	-0.177	-0.175	-0.172
	Excess Return (%)	0.632	0.756	0.920	0.907	0.619	0.686	0.423	0.366
	Std. Dev.(%) - Active Strategy	3.468	3.637	3.446	3.482	3.858	3.852	3.852	3.887
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.960	1.937	1.941	1.938	1.952	1.950	1.960	1.971
	Infor. Ratio	0.163	0.181	0.228	0.230	0.142	0.159	0.098	0.081
	Prob > Passive Equal Weighted Portfolio (%)	56.94%	57.67%	61.21%	61.61%	62.50%	65.85%	61.88%	59.80%
	: paired t-test	2.399*	2.648**	3.339**	3.337**	2.049*	2.272*	1.387	1.142
	: Wilcoxon test	3.162**	3.467**	4.314**	4.620**	3.996**	4.388**	2.953**	2.703**

*Table 5 presents the results of Strategy One back tested over various formation look back periods (from 1 to 18 months) utlising interest adjusted returns as the source of momentum. Excess return refers to profits generated by the strategy which are greater than the passive buy-and-hold equal weighted portfolio of the respective six foreign currencies. The parametric paired t-test and the non-parametric Wilcoxon test is shown to test the statistical significance of the excess returns relative to the passive equal weighted long only portfolio, ** and * indicate statistical significance at the 1% and 5% levels, respectively.*

TABLE 6
Strategy Two Results - 1980 to 1998

Panel A: Source of Momentum - Raw Currency Returns

	Momentum Formation Period (in months):	**1**	**2**	**3**	**6**	**9**	**12**	**15**	**18**
CANADA	Mean Ret.(%) - Active Strategy	0.232	0.271	0.234	0.281	0.394	0.240	-0.012	-0.004
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.055	0.077	0.086	0.127	0.160	0.152	0.168	0.171
	Excess Return (%)	0.177	0.194	0.148	0.154	0.234	0.088	-0.180	-0.176
	Std. Dev.(%) - Active Strategy	2.456	2.484	2.602	2.648	2.601	2.475	2.588	2.482
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.561	2.547	2.550	2.543	2.543	2.559	2.572	2.580
	Infor. Ratio	0.048	0.052	0.039	0.043	0.061	0.024	-0.048	-0.049
	Prob > Passive Equal Weighted Portfolio (%)	53.70%	52.56%	56.07%	54.50%	56.73%	55.61%	50.99%	50.25%
	: paired t-test	0.706	0.768	0.575	0.617	0.887	0.341	-0.681	-0.696
	: Wilcoxon test	0.799	1.045	0.936	0.870	1.347	0.905	-0.271	-0.402
U.K.	Mean Ret.(%) - Active Strategy	0.274	0.394	0.445	0.256	0.471	0.327	0.147	0.011
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.055	0.068	0.039	0.039	-0.008	0.002	-0.002	-0.007
	Excess Return (%)	0.219	0.326	0.406	0.217	0.479	0.325	0.149	0.018
	Std. Dev.(%) - Active Strategy	2.829	2.790	2.909	2.984	3.028	2.846	2.894	2.864
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.368	2.366	2.334	2.345	2.315	2.296	2.311	2.325
	Infor. Ratio	0.060	0.089	0.109	0.057	0.122	0.087	0.039	0.005
	Prob > Passive Equal Weighted Portfolio (%)	52.31%	57.21%	56.07%	53.55%	57.69%	54.15%	51.98%	52.26%
	: paired t-test	0.877	1.309	1.589	0.830	1.762	1.250	0.553	0.065
	: Wilcoxon test	1.548	1.534	1.998*	1.452	2.701**	2.313*	1.485	0.711
U.S.A.	Mean Ret.(%) - Active Strategy	0.156	0.185	0.138	0.283	0.315	0.201	-0.022	-0.046
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.122	0.144	0.155	0.193	0.219	0.192	0.230	0.237
	Excess Return (%)	0.034	0.041	-0.017	0.091	0.096	0.009	-0.252	-0.283
	Std. Dev.(%) - Active Strategy	2.529	2.455	2.618	2.629	2.598	2.466	2.469	2.463
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.501	2.486	2.487	2.474	2.468	2.473	2.468	2.473
	Infor. Ratio	0.009	0.011	-0.005	0.026	0.026	0.002	-0.071	-0.079
	Prob > Passive Equal Weighted Portfolio (%)	50.46%	50.23%	51.40%	53.55%	51.44%	51.22%	47.52%	46.73%
	: paired t-test	0.134	0.168	-0.066	0.376	0.379	0.035	-1.011	-1.117
	: Wilcoxon test	0.193	0.35100	0.057	0.676	0.78100	0.653	-0.588	-0.852
JAPAN	Mean Ret.(%) - Active Strategy	0.381	0.379	0.342	0.325	0.400	0.269	0.073	0.007
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.092	0.101	0.100	0.090	0.085	0.088	0.056	0.035
	Excess Return (%)	0.288	0.278	0.241	0.236	0.315	0.181	0.017	-0.029
	Std. Dev.(%) - Active Strategy	2.677	2.807	2.878	2.866	2.945	2.869	2.883	2.872
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.963	2.967	2.974	2.993	2.996	2.978	2.986	2.981
	Infor. Ratio	0.069	0.066	0.056	0.054	0.072	0.042	0.004	-0.007
	Prob > Passive Equal Weighted Portfolio (%)	50.46%	51.63%	50.47%	48.34%	49.52%	50.73%	49.50%	49.25%
	: paired t-test	1.008	0.962	0.818	0.785	1.036	0.601	0.056	-0.093
	: Wilcoxon test	0.485	0.50900	0.483	0.625	1.12200	0.651	-0.050	-0.267

GERMANY	Mean Ret.(%) - Active Strategy	0.251	0.341	0.425	0.294	0.438	0.319	0.078	0.024
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.112	0.089	0.098	0.080	0.073	0.098	0.089	0.099
	Excess Return (%)	0.139	0.252	0.327	0.214	0.365	0.220	-0.011	-0.074
	Std. Dev.(%) - Active Strategy	2.768	2.785	2.847	2.869	2.992	2.862	2.877	2.863
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.818	1.790	1.789	1.787	1.799	1.775	1.784	1.794
	Infor. Ratio	0.043	0.076	0.098	0.059	0.102	0.065	-0.003	-0.021
	Prob > Passive Equal Weighted Portfolio (%)	51.39%	53.95%	52.34%	53.08%	53.85%	54.15%	50.00%	49.25%
	:paired t-test	0.627	1.119	1.428	0.861	1.475	0.926	-0.045	-0.294
	:Wilcoxon test	0.950	1.227	1.547	1.535	2.188*	1.888*	0.601	0.039
FRANCE	Mean Ret.(%) - Active Strategy	0.283	0.355	0.443	0.201	0.420	0.316	0.098	-0.080
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.006	-0.015	-0.018	-0.040	-0.042	-0.042	-0.050	-0.045
	Excess Return (%)	0.277	0.371	0.461*	0.241	0.462	0.357	0.147	-0.035
	Std. Dev.(%) - Active Strategy	2.859	2.742	2.921	2.401	2.985	2.913	2.973	2.893
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.751	1.725	1.729	1.724	1.734	1.705	1.716	1.724
	Infor. Ratio	0.085	0.113	0.136	0.093	0.133	0.107	0.043	-0.010
	Prob > Passive Equal Weighted Portfolio (%)	50.93%	50.23%	51.40%	53.08%	58.17%	58.54%	55.45%	53.27%
	:paired t-test	1.242	1.657	1.996*	1.356	1.920	1.528	0.611	-0.140
	:Wilcoxon test	1.695*	1.975*	2.249*	1.872*	2.774**	2.795**	1.452	0.543
ITALY	Mean Ret.(%) - Active Strategy	0.304	0.340	0.472	0.329	0.490	0.344	0.163	-0.016
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.124	-0.147	-0.145	-0.172	-0.171	-0.177	-0.175	-0.172
	Excess Return (%)	0.428	0.487	0.617	0.501	0.661	0.521	0.338	0.156
	Std. Dev.(%) - Active Strategy	2.828	2.830	2.949	2.993	2.992	2.957	3.042	2.952
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.960	1.937	1.941	1.938	1.952	1.950	1.960	1.971
	Infor. Ratio	0.126	0.147	0.181	0.141	0.189	0.147	0.094	0.044
	Prob > Passive Equal Weighted Portfolio (%)	56.02%	57.21%	57.01%	60.19%	64.90%	65.85%	60.40%	59.80%
	:paired t-test	1.854	2.158*	2.642**	2.042*	2.726**	2.106*	1.331	0.627
	:Wilcoxon test	2.577**	2.549**	3.172**	3.336**	4.035**	4.182**	2.879**	1.970*

*Table 6 presents the results of Strategy Two back tested over various formation look back periods (from 1 to 18 months) utlising raw currency returns as the source of momentum. Excess return refers to profits generated by the strategy which are greater than the passive buy-and-hold equal weighted portfolio of the respective six foreign currencies. The parametric paired t-test and the non-parametric Wilcoxon test is shown to test the statistical significance of the excess returns relative to the passive equal weighted long only portfolio, ** and * indicate statistical significance at the 1% and 5% levels, respectively.*

TABLE 6
Strategy Two Results - 1980 to 1998

Panel B: Source of Momentum- Interest Adjusted Returns

Momentum Formation Period (in months):		**1**	**2**	**3**	**6**	**9**	**12**	**15**	**18**
CANADA	Mean Ret.(%) - Active Strategy	0.313	0.438	0.330	0.338	0.422	0.259	0.172	0.067
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.055	0.077	0.086	0.127	0.160	0.152	0.168	0.171
	Excess Return (%)	0.258	0.361	0.244	0.212	0.262	0.107	0.004	-0.104
	Std. Dev.(%) - Active Strategy	2.439	2.430	2.571	2.724	2.702	2.570	2.525	2.487
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.561	2.547	2.550	2.543	2.543	2.559	2.572	2.580
	Infor. Ratio	0.071	0.101	0.066	0.056	0.066	0.028	0.001	-0.029
	Prob > Passive Equal Weighted Portfolio (%)	55.09%	56.28%	60.28%	57.82%	62.50%	58.54%	55.94%	51.76%
	: paired t-test	1.045	1.476	0.970	0.815	0.957	0.396	0.016	-0.414
	: Wilcoxon test	1.297	1.950*	1.527	1.357	1.707*	1.323	0.637	0.156
U.K.	Mean Ret.(%) - Active Strategy	0.349	0.525	0.549	0.324	0.407	0.453	0.322	0.157
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.055	0.068	0.039	0.039	-0.008	0.002	-0.002	-0.007
	Excess Return (%)	0.293	0.457	0.510*	0.286	0.415	0.451	0.324	0.164
	Std. Dev.(%) - Active Strategy	2.881	2.731	2.791	3.014	3.069	3.008	2.959	2.906
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.368	2.366	2.334	2.345	2.315	2.296	2.311	2.325
	Infor. Ratio	0.077	0.127	0.141	0.074	0.102	0.113	0.081	0.041
	Prob > Passive Equal Weighted Portfolio (%)	54.63%	60.00%	58.88%	55.92%	58.65%	59.02%	55.94%	54.77%
	: paired t-test	1.126	1.856	2.062*	1.073	1.471	1.621	1.156	0.578
	: Wilcoxon test	1.983*	2.284*	2.707**	1.910*	2.731**	3.109**	2.494**	1.512
U.S.A.	Mean Ret.(%) - Active Strategy	0.204	0.422	0.298	0.359	0.384	0.221	0.051	0.003
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.122	0.144	0.155	0.193	0.219	0.192	0.230	0.237
	Excess Return (%)	0.082	0.278	0.143	0.166	0.165	0.029	-0.179	-0.234
	Std. Dev.(%) - Active Strategy	2.538	2.402	2.598	2.605	2.656	2.589	2.551	2.431
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.501	2.486	2.487	2.474	2.468	2.473	2.468	2.473
	Infor. Ratio	0.022	0.078	0.037	0.045	0.043	0.008	-0.049	-0.065
	Prob > Passive Equal Weighted Portfolio (%)	50.46%	55.35%	55.61%	57.82%	56.25%	53.66%	50.50%	49.25%
	: paired t-test	0.327	1.149	0.548	0.660	0.626	0.108	-0.690	-0.910
	: Wilcoxon test	0.476	1.41900	1.072	1.182	1.26500	0.994	-0.034	-0.469
JAPAN	Mean Ret.(%) - Active Strategy	0.505	0.471	0.376	0.374	0.354	0.346	0.266	0.178
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.092	0.101	0.100	0.090	0.085	0.088	0.056	0.035
	Excess Return (%)	0.413	0.370	0.276	0.284	0.269	0.259	0.209	0.142
	Std. Dev.(%) - Active Strategy	2.652	2.716	2.791	2.895	2.928	2.844	2.844	2.784
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.963	2.967	2.974	2.993	2.996	2.978	2.986	2.981
	Infor. Ratio	0.101	0.088	0.065	0.066	0.062	0.061	0.050	0.034
	Prob > Passive Equal Weighted Portfolio (%)	52.31%	53.02%	51.40%	50.24%	50.96%	52.68%	50.99%	49.75%
	: paired t-test	1.479	1.293	0.944	0.955	0.889	0.870	0.710	0.480
	: Wilcoxon test	0.974	1.09900	0.715	0.958	1.02400	1.063	0.660	0.400

GERMANY	Mean Ret.(%) - Active Strategy	0.384	0.522	0.461	0.365	0.359	0.367	0.321	0.194
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.112	0.089	0.098	0.080	0.073	0.098	0.089	0.099
	Excess Return (%)	0.271	0.433	0.363	0.285	0.287	0.268	0.232	0.096
	Std. Dev.(%) - Active Strategy	2.780	2.753	2.790	2.962	2.989	2.895	2.909	2.805
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.818	1.790	1.789	1.787	1.799	1.775	1.784	1.794
	Infor. Ratio	0.083	0.130	0.105	0.077	0.079	0.075	0.064	0.027
	Prob > Passive Equal Weighted Portfolio (%)	53.2%	56.7%	57.0%	57.8%	56.7%	55.1%	56.4%	55.3%
	:paired t-test	1.216	1.900	1.542	1.120	1.143	1.081	0.914	0.377
	:Wilcoxon test	1.558	2.414**	2.236*	2.105*	2.064*	2.538**	2.060*	1.455
FRANCE	Mean Ret.(%) - Active Strategy	0.491	0.553	0.541	0.370	0.396	0.418	0.357	0.194
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.006	-0.015	-0.018	-0.040	-0.042	-0.042	-0.050	-0.045
	Excess Return (%)	0.484*	0.568*	0.558*	0.410	0.438	0.459	0.407	0.239
	Std. Dev.(%) - Active Strategy	2.884	2.706	2.852	2.957	3.016	2.931	2.920	2.788
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.751	1.725	1.729	1.724	1.734	1.705	1.716	1.724
	Infor. Ratio	0.146	0.170	0.165	0.115	0.125	0.135	0.118	0.072
	Prob > Passive Equal Weighted Portfolio (%)	54.6%	54.4%	55.1%	57.3%	60.6%	63.4%	61.4%	61.3%
	:paired t-test	2.151*	2.497*	2.410*	1.666	1.799	1.928	1.672	1.009
	:Wilcoxon test	2.609**	3.267**	3.056**	2.891**	2.970**	3.733**	3.110**	2.242*
ITALY	Mean Ret.(%) - Active Strategy	0.413	0.492	0.520	0.375	0.474	0.407	0.288	0.187
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.124	-0.147	-0.145	-0.172	-0.171	-0.177	-0.175	-0.172
	Excess Return (%)	0.537	0.638	0.665	0.547	0.644	0.584	0.463	0.359
	Std. Dev.(%) - Active Strategy	2.819	2.733	2.852	2.979	3.070	2.984	2.936	2.918
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.960	1.937	1.941	1.938	1.952	1.950	1.960	1.971
	Infor. Ratio	0.158	0.192	0.194	0.153	0.181	0.163	0.130	0.102
	Prob > Passive Equal Weighted Portfolio (%)	57.4%	57.2%	63.1%	61.6%	66.3%	67.8%	63.4%	63.3%
	:paired t-test	2.322*	2.813**	2.844**	2.216*	2.610**	2.330*	1.847	1.444
	:Wilcoxon test	3.031**	3.719**	3.983**	3.699**	4.479**	4.792**	3.816**	2.865**

*Table 6 presents the results of Strategy Two back tested over various formation look back periods (from 1 to 18 months) utlising interest adjusted returns as the source of momentum. Excess return refers to profits generated by the strategy which are greater than the passive buy-and-hold equal weighted portfolio of the respective six foreign currencies. The parametric paired t-test and the non-parametric Wilcoxon test is shown to test the statistical significance of the excess returns relative to the passive equal weighted long only portfolio, ** and * indicate statistical significance at the 1% and 5% levels, respectively.*

TABLE 7
Strategy One Results - 1999 to 2004

Panel A: Source of Momentum - Raw Currency Returns

	Momentum Formation Period (in months):	**1**	**2**	**3**	**6**	**9**	**12**	**15**	**18**
CANADA	Mean Ret.(%) - Active Strategy	0.583	0.029	0.358	0.199	1.052	0.534	0.401	0.653
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.146	-0.110	-0.103	-0.012	-0.113	-0.066	-0.030	-0.025
	Excess Return (%)	0.776	0.187	0.509	0.262	1.219	0.658	0.492	0.744
	Std. Dev.(%) - Active Strategy	2.570	2.727	2.770	3.185	2.943	3.194	3.146	3.447
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.053	2.051	2.068	2.043	1.924	1.961	1.973	2.031
	Infor. Ratio	0.227	0.011	0.129	0.062	0.357	0.167	0.127	0.190
	Prob > Passive Equal Weighted Portfolio (%)	58.33%	50.85%	60.34%	50.91%	59.62%	51.02%	50.00%	58.14%
	: paired t-test	1.927	0.462	1.229	0.550	2.524*	1.160	0.865	1.115
	: Wilcoxon test	1.963*	0.326	1.231	0.517	2.022*	0.963	0.664	1.360
U.K.	Mean Ret.(%) - Active Strategy	0.751	0.258	0.122	0.116	0.767	0.527	0.327	0.516
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.188	-0.211	-0.194	-0.221	-0.218	-0.256	-0.264	-0.351
	Excess Return (%)	0.893	0.423	0.268	0.287	0.932	0.727	0.531	0.803
	Std. Dev.(%) - Active Strategy	3.136	2.914	3.143	3.100	3.016	3.186	3.130	3.364
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.860	1.868	1.879	1.912	1.930	1.961	1.987	1.958
	Infor. Ratio	0.239	0.089	0.039	0.038	0.254	0.166	0.104	0.153
	Prob > Passive Equal Weighted Portfolio (%)	61.67%	54.24%	53.45%	49.09%	57.69%	57.14%	56.52%	67.44%
	: paired t-test	1.908	0.910	0.557	0.592	1.945	1.367	1.031	1.398
	: Wilcoxon test	1.727*	0.686	0.569	0.858	1.749*	1.346	0.867	1.455
U.S.A.	Mean Ret.(%) - Active Strategy	0.127	-0.207	-0.093	-0.233	0.204	-0.291	-0.261	0.051
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.208	0.244	0.255	0.291	0.208	0.231	0.285	0.363
	Excess Return (%)	-0.077	-0.448	-0.345	-0.520	-0.001	-0.519	-0.542	-0.307
	Std. Dev.(%) - Active Strategy	2.777	2.834	2.751	3.476	3.267	3.223	3.082	3.319
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.815	1.808	1.822	1.860	1.873	1.916	1.915	1.882
	Infor. Ratio	0.046	-0.073	-0.034	-0.067	0.062	-0.090	-0.085	0.016
	Prob > Passive Equal Weighted Portfolio (%)	46.67%	45.76%	51.72%	45.45%	42.31%	42.86%	43.48%	55.81%
	: paired t-test	-0.204	-1.123	-0.845	-1.036	-0.001	-0.936	-1.007	-0.520
	: Wilcoxon test	-0.105	-1.068	-0.718	-0.655	-0.605	-1.339	-0.914	-0.367

JAPAN	Mean Ret.(%) - Active Strategy	0.142	0.195	0.082	0.049	0.776	0.415	0.382	0.552
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.335	0.318	0.328	0.305	0.513	0.631	0.665	0.649
	Excess Return (%)	-0.217	-0.147	-0.270	-0.282	0.236	-0.245	-0.313	-0.131
	Std. Dev.(%) - Active Strategy	2.485	2.815	3.056	2.880	2.453	2.751	2.982	3.116
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.736	2.756	2.779	2.848	2.769	2.769	2.592	2.644
	Infor. Ratio	0.057	0.069	0.027	0.017	0.316	0.151	0.128	0.177
	Prob > Passive Equal Weighted Portfolio (%)	53.33%	47.46%	44.83%	49.09%	53.85%	46.94%	50.00%	46.51%
	: paired t-test	-0.449	-0.274	-0.473	-0.471	0.415	-0.408	-0.484	-0.195
	: Wilcoxon test	-0.588	-0.315	-0.657	-0.176	0.709	-0.416	-0.476	-0.600
EURO	Mean Ret.(%) - Active Strategy	0.002	-0.450	0.161	0.254	0.364	0.358	0.247	0.023
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.002	-0.031	-0.076	-0.152	-0.191	-0.349	-0.481	-0.470
	Excess Return (%)	0.021	-0.398	0.258	0.428	0.579	0.731	0.754	0.521
	Std. Dev.(%) - Active Strategy	2.665	2.668	2.930	3.270	3.183	3.023	2.889	3.077
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.399	2.406	2.402	2.434	2.461	2.422	2.403	2.402
	Infor. Ratio	0.001	-0.169	0.055	0.078	0.114	0.118	0.085	0.007
	Prob > Passive Equal Weighted Portfolio (%)	48.33%	47.46%	53.45%	56.36%	55.77%	53.06%	58.70%	55.81%
	:paired t-test	0.041	-0.806	0.496	0.783	1.013	1.320	1.348	0.931
	:Wilcoxon test	0.074	-0.724	0.674	0.655	0.930	1.098	1.398	0.877

*Table 7 presents the results of Strategy One back tested over various formation look back periods (from 1 to 18 months) utlising raw currency returns as the source of momentum. Excess return refers to profits generated by the strategy which are greater than the passive buy-and-hold equal weighted portfolio of the respective six foreign currencies. The parametric paired t-test and the non-parametric Wilcoxon test is shown to test the statistical significance of the excess returns relative to the passive equal weighted long only portfolio, ** and * indicate statistical significance at the 1% and 5% levels, respectively.*

TABLE 7
Strategy One Results - 1999 to 2004

Panel B: Source of Momentum - Interest Adjusted Returns

	Momentum Formation Period (in months):	**1**	**2**	**3**	**6**	**9**	**12**	**15**	**18**
CANADA	Mean Ret.(%) - Active Strategy	0.629	0.409	0.528	0.233	1.009	0.745	0.511	0.735
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.146	-0.110	-0.103	-0.012	-0.113	-0.066	-0.030	-0.025
	Excess Return (%)	0.775	0.519	0.631	0.245	1.123	0.811	0.541	0.760
	Std. Dev.(%) - Active Strategy	2.979	2.950	2.773	3.129	3.197	3.274	3.142	3.430
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.053	2.051	2.068	2.043	1.924	1.961	1.973	2.031
	Infor. Ratio	0.211	0.139	0.190	0.075	0.316	0.228	0.163	0.214
	Prob > Passive Equal Weighted Portfolio (%)	58.33%	57.63%	60.34%	50.91%	55.77%	51.02%	52.17%	51.16%
	: paired t-test	1.523	1.042	1.275	0.461	2.163*	1.449	0.941	1.171
	: Wilcoxon test	1.653*	1.085	1.568	0.828	1.931*	1.375	0.773	1.619
U.K.	Mean Ret.(%) - Active Strategy	0.833	0.474	0.317	0.363	0.903	0.581	0.465	0.625
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.188	-0.211	-0.194	-0.221	-0.218	-0.256	-0.264	-0.351
	Excess Return (%)	1.021	0.686	0.510	0.584	1.121	0.836	0.729	0.976
	Std. Dev.(%) - Active Strategy	3.233	2.942	3.212	3.134	3.011	2.919	3.160	3.381
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.860	1.868	1.879	1.912	1.930	1.961	1.987	1.958
	Infor. Ratio	0.258	0.161	0.099	0.116	0.300	0.199	0.147	0.185
	Prob > Passive Equal Weighted Portfolio (%)	61.67%	57.63%	60.34%	60.00%	61.54%	61.22%	58.70%	60.47%
	: paired t-test	2.013*	1.473	0.962	1.143	2.180*	1.581	1.218	1.602
	: Wilcoxon test	1.685*	1.235	0.999	1.551	2.230*	1.872*	1.187	1.888*
U.S.A.	Mean Ret.(%) - Active Strategy	0.377	0.132	0.087	0.211	0.207	-0.049	0.178	0.342
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.208	0.244	0.255	0.291	0.208	0.231	0.285	0.363
	Excess Return (%)	0.169	-0.112	-0.168	-0.080	-0.001	-0.281	-0.107	-0.021
	Std. Dev.(%) - Active Strategy	3.208	2.772	2.962	3.013	3.442	3.040	2.960	3.534
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.815	1.808	1.822	1.860	1.873	1.916	1.915	1.882
	Infor. Ratio	0.117	0.048	0.029	0.070	0.060	-0.016	0.060	0.097
	Prob > Passive Equal Weighted Portfolio (%)	51.67%	45.76%	43.10%	45.45%	44.23%	42.86%	47.83%	48.84%
	: paired t-test	0.392	-0.245	-0.350	-0.156	-0.002	-0.505	-0.198	-0.033
	: Wilcoxon test	0.042	-0.175	-0.331	-0.218	-0.416	-0.544	-0.320	0.186

JAPAN	Mean Ret.(%) - Active Strategy	0.180	0.281	0.156	0.196	0.669	0.307	0.475	0.714
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.335	0.318	0.328	0.305	0.513	0.631	0.665	0.649
	Excess Return (%)	-0.155	-0.037	-0.172	-0.109	0.156	-0.324	-0.189	0.065
	Std. Dev.(%) - Active Strategy	2.570	2.872	3.040	2.895	2.781	2.703	3.038	3.093
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.736	2.756	2.779	2.848	2.769	2.769	2.592	2.644
	Infor. Ratio	0.070	0.098	0.051	0.068	0.241	0.114	0.156	0.231
	Prob > Passive Equal Weighted Portfolio (%)	43.33%	44.07%	41.38%	47.27%	53.85%	38.78%	43.48%	44.19%
	: paired t-test	-0.328	-0.068	-0.324	-0.196	0.266	-0.585	-0.321	0.098
	: Wilcoxon test	-0.614	-0.073	-0.387	0.230	0.650	-0.700	-0.289	-0.255
EURO	Mean Ret.(%) - Active Strategy	0.136	-0.131	0.408	0.308	0.481	0.557	0.405	0.436
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.002	-0.031	-0.076	-0.152	-0.191	-0.349	-0.481	-0.470
	Excess Return (%)	0.134	-0.100	0.484	0.460	0.673	0.906	0.886	0.906
	Std. Dev.(%) - Active Strategy	2.517	2.777	3.217	3.344	3.022	3.007	2.944	3.149
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.399	2.406	2.402	2.434	2.461	2.422	2.403	2.402
	Infor. Ratio	0.054	-0.047	0.127	0.092	0.159	0.185	0.137	0.138
	Prob > Passive Equal Weighted Portfolio (%)	55.00%	50.85%	55.17%	50.91%	57.69%	63.27%	63.04%	62.79%
	:paired t-test	0.282	-0.210	0.881	0.778	1.209	1.507	1.616	1.643
	:Wilcoxon test	0.441	-0.250	1.209	0.929	1.300	1.600	1.647*	1.663*

Table 7 presents the results of Strategy One back tested over various formation look back periods (from 1 to 18 months) utlising interest adjusted returns as the source of momentum. Excess return refers to profits generated by the strategy which are greater than the passive buy-and-hold equal weighted portfolio of the respective six foreign currencies. The parametric paired t-test and the non-parametric Wilcoxon test is shown to test the statistical significance of the excess returns relative to the passive equal weighted long only portfolio,
*** and * indicate statistical significance at the 1% and 5% levels, respectively.*

TABLE 8
Strategy Two Results - 1999 to 2004

Panel A: Source of Momentum - Raw Currency Returns

	Momentum Formation Period (in months):	**1**	**2**	**3**	**6**	**9**	**12**	**15**	**18**
CANADA	Mean Ret.(%) - Active Strategy	1.015	0.136	0.113	0.114	0.498	0.240	0.176	0.442
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.146	-0.110	-0.103	-0.012	-0.113	-0.066	-0.030	-0.025
	Excess Return (%)	1.208	0.294	0.264	0.177	0.665	0.364	0.267	0.533
	Std. Dev.(%) - Active Strategy	3.973	1.719	2.297	2.301	2.440	2.310	2.419	2.297
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.053	2.051	2.068	2.043	1.924	1.961	1.973	2.031
	Infor. Ratio	0.255	0.079	0.049	0.050	0.204	0.104	0.073	0.193
	Prob > Passive Equal Weighted Portfolio (%)	58.33%	61.02%	55.17%	56.36%	59.62%	57.14%	56.52%	58.14%
	: paired t-test	2.215*	0.939	0.671	0.448	1.520	0.814	0.571	1.099
	: Wilcoxon test	2.115*	1.015	1.138	0.720	1.749*	1.197	0.882	1.481
U.K.	Mean Ret.(%) - Active Strategy	1.323	0.472	0.285	0.007	0.209	0.190	-0.004	0.180
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.188	-0.211	-0.194	-0.221	-0.218	-0.256	-0.264	-0.351
	Excess Return (%)	1.511	0.683	0.479	0.228	0.427	0.446	0.259	0.531
	Std. Dev.(%) - Active Strategy	3.893	1.985	2.289	2.437	2.051	2.064	2.095	2.356
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.860	1.868	1.879	1.912	1.930	1.961	1.987	1.958
	Infor. Ratio	0.340	0.238	0.124	0.003	0.102	0.092	-0.002	0.076
	Prob > Passive Equal Weighted Portfolio (%)	70.00%	64.41%	55.17%	52.73%	61.54%	53.06%	52.17%	60.47%
	: paired t-test	2.701**	1.711	1.283	0.442	1.043	0.998	0.483	1.078
	: Wilcoxon test	2.556**	2.064*	1.287	0.756	1.131	0.849	1.070	1.170
U.S.A.	Mean Ret.(%) - Active Strategy	0.618	-0.169	-0.105	-0.089	0.119	-0.110	-0.147	-0.061
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.208	0.244	0.255	0.291	0.208	0.231	0.285	0.363
	Excess Return (%)	0.414	-0.410	-0.357	-0.376	-0.086	-0.337	-0.429	-0.420
	Std. Dev.(%) - Active Strategy	4.092	1.616	2.062	2.330	2.336	2.387	2.297	2.474
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.815	1.808	1.822	1.860	1.873	1.916	1.915	1.882
	Infor. Ratio	0.151	-0.105	-0.051	-0.038	0.051	-0.046	-0.064	-0.025
	Prob > Passive Equal Weighted Portfolio (%)	51.67%	40.68%	48.28%	43.64%	48.08%	44.90%	43.48%	46.51%
	: paired t-test	0.821	-1.400	-0.947	-0.925	-0.203	-0.761	-0.982	-0.942
	: Wilcoxon test	0.436	-1.181	-0.801	-0.930	-0.208	-0.821	-1.046	-0.903

JAPAN	Mean Ret.(%) - Active Strategy	0.996	0.153	-0.299	0.145	0.393	0.238	0.226	0.420
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.335	0.318	0.328	0.305	0.513	0.631	0.665	0.649
	Excess Return (%)	0.637	-0.189	-0.651	-0.186	-0.147	-0.422	-0.469	-0.262
	Std. Dev.(%) - Active Strategy	3.747	1.852	2.859	2.042	1.961	2.037	2.131	2.295
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.736	2.756	2.779	2.848	2.769	2.769	2.592	2.644
	Infor. Ratio	0.266	0.083	-0.104	0.071	0.200	0.117	0.106	0.183
	Prob > Passive Equal Weighted Portfolio (%)	56.67%	54.24%	50.00%	52.73%	53.85%	40.82%	41.30%	51.16%
	: paired t-test	1.111	-0.412	-1.214	-0.350	-0.286	-0.789	-0.886	-0.470
	: Wilcoxon test	1.102	-0.180	-0.889	0.027	0.150	-0.565	-0.515	0.004
EURO	Mean Ret.(%) - Active Strategy	0.310	-0.197	0.083	0.049	0.066	0.199	-0.027	-0.043
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.002	-0.031	-0.076	-0.152	-0.191	-0.349	-0.481	-0.470
	Excess Return (%)	0.329	-0.145	0.180	0.223	0.281	0.572	0.481	0.455
	Std. Dev.(%) - Active Strategy	3.526	1.894	2.545	2.221	1.997	2.058	2.015	2.072
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.399	2.406	2.402	2.434	2.461	2.422	2.403	2.402
	Infor. Ratio	0.088	-0.104	0.033	0.022	0.033	0.097	-0.013	-0.021
	Prob > Passive Equal Weighted Portfolio (%)	58.33%	47.46%	50.00%	52.73%	53.85%	53.06%	54.35%	55.81%
	:paired t-test	0.533	-0.348	0.371	0.480	0.642	1.228	1.060	0.990
	:Wilcoxon test	0.772	-0.390	0.133	0.547	0.644	1.126	1.062	1.015

*Table 8 presents the results of Strategy Two back tested over various formation look back periods (from 1 to 18 months) utlising raw currency returns as the source of momentum. Excess return refers to profits generated by the strategy which are greater than the passive buy-and-hold equal weighted portfolio of the respective six foreign currencies. The parametric paired t-test and the non-parametric Wilcoxon test is shown to test the statistical significance of the excess returns relative to the passive equal weighted long only portfolio, ** and * indicate statistical significance at the 1% and 5% levels, respectively.*

TABLE 8
Strategy Two Results - 1999 to 2004

Panel B: Source of Momentum - Interest Adjusted Returns

	Momentum Formation Period (in months):	**1**	**2**	**3**	**6**	**9**	**12**	**15**	**18**
CANADA	Mean Ret.(%) - Active Strategy	0.968	0.380	0.224	0.370	1.057	1.387	0.765	1.433
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.146	-0.110	-0.103	-0.012	-0.113	-0.066	-0.030	-0.025
	Excess Return (%)	1.114	0.491	0.326	0.381	1.170	1.453	0.795	1.458
	Std. Dev.(%) - Active Strategy	3.881	3.584	3.601	4.208	4.400	4.137	5.103	5.023
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.053	2.051	2.068	2.043	1.924	1.961	1.973	2.031
	Infor. Ratio	0.249	0.106	0.062	0.088	0.240	0.335	0.150	0.285
	Prob > Passive Equal Weighted Portfolio (%)	63.33%	57.63%	62.07%	56.36%	61.54%	65.31%	56.52%	60.47%
	: paired t-test	1.836	0.826	0.550	0.551	1.968	2.208	0.993	1.728
	: Wilcoxon test	1.974*	0.692	0.784	0.266	2.301*	2.228*	1.242	1.922*
U.K.	Mean Ret.(%) - Active Strategy	1.385	1.121	0.453	0.170	0.655	0.323	0.957	0.742
	Mean Ret.(%) - Passive Equal Weighted Portfolio	-0.188	-0.211	-0.194	-0.221	-0.218	-0.256	-0.264	-0.351
	Excess Return (%)	1.572	1.333	0.647	0.391	0.873	0.579	1.220	1.093
	Std. Dev.(%) - Active Strategy	4.016	4.018	4.496	4.353	4.156	3.830	4.161	4.691
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.860	1.868	1.879	1.912	1.930	1.961	1.987	1.958
	Infor. Ratio	0.880	0.842	0.700	0.434	0.750	0.558	0.784	0.679
	Prob > Passive Equal Weighted Portfolio (%)	63.33%	59.32%	53.45%	52.73%	61.54%	51.02%	60.87%	55.81%
	: paired t-test	2.706**	2.278*	0.967	0.579	1.403	0.862	1.679	1.354
	: Wilcoxon test	3.023**	2.554**	1.071	0.601	1.495	0.828	1.804*	1.732*
U.S.A.	Mean Ret.(%) - Active Strategy	0.775	0.107	0.760	-0.075	0.687	0.338	-0.010	0.350
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.208	0.244	0.255	0.291	0.208	0.231	0.285	0.363
	Excess Return (%)	0.568	-0.137	0.505	-0.365	0.479	0.106	-0.296	-0.013
	Std. Dev.(%) - Active Strategy	3.958	3.570	4.339	4.496	4.415	4.270	4.944	4.963
	Std. Dev.(%) - Passive Equal Weighted Portfolio	1.815	1.808	1.822	1.860	1.873	1.916	1.915	1.882
	Infor. Ratio	0.196	0.030	0.175	-0.017	0.156	0.079	-0.002	0.071
	Prob > Passive Equal Weighted Portfolio (%)	55.00%	52.54%	55.17%	47.27%	57.69%	51.02%	47.83%	51.16%
	: paired t-test	1.085	-0.276	0.813	-0.555	0.768	0.164	-0.363	-0.016
	: Wilcoxon test	0.971	0.030	0.674	-0.995	0.702	-0.203	-0.531	-0.186

JAPAN	Mean Ret.(%) - Active Strategy	0.927	0.357	0.063	0.488	1.173	0.618	0.212	0.969
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.335	0.318	0.328	0.305	0.513	0.631	0.665	0.649
	Excess Return (%)	0.592	0.038	-0.265	0.183	0.660	-0.013	-0.453	0.320
	Std. Dev.(%) - Active Strategy	3.709	3.682	4.037	4.199	4.293	4.087	4.517	4.398
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.736	2.756	2.779	2.848	2.769	2.769	2.592	2.644
	Infor. Ratio	0.250	0.097	0.016	0.116	0.273	0.151	0.047	0.220
	Prob > Passive Equal Weighted Portfolio (%)	51.67%	47.46%	48.28%	52.73%	63.46%	53.06%	45.65%	48.84%
	: paired t-test	1.035	0.065	-0.433	0.269	0.971	-0.018	-0.581	0.397
	: Wilcoxon test	1.029	0.250	-0.409	0.332	0.943	0.266	-0.328	0.730
EURO	Mean Ret.(%) - Active Strategy	0.371	-0.078	0.168	0.393	-0.188	0.562	0.964	0.551
	Mean Ret.(%) - Passive Equal Weighted Portfolio	0.002	-0.031	-0.076	-0.152	-0.191	-0.349	-0.481	-0.470
	Excess Return (%)	0.369	-0.047	0.243	0.545	0.003	0.910	1.445	1.021
	Std. Dev.(%) - Active Strategy	3.777	3.560	3.719	4.062	4.265	3.888	3.858	4.305
	Std. Dev.(%) - Passive Equal Weighted Portfolio	2.399	2.406	2.402	2.434	2.461	2.422	2.403	2.402
	Infor. Ratio	0.098	-0.022	0.045	0.097	-0.044	0.144	0.250	0.128
	Prob > Passive Equal Weighted Portfolio (%)	56.67%	45.76%	46.55%	52.73%	46.15%	48.98%	56.52%	53.49%
	:paired t-test	0.671	-0.085	0.423	0.785	0.006	1.326	2.021*	1.432
	:Wilcoxon test	1.139	0.035	0.718	0.714	0.039	1.247	2.015*	1.533

*Table 8 presents the results of Strategy Two back tested over various formation look back periods (from 1 to 18 months) utlising raw currency returns as the source of momentum. Excess return refers to profits generated by the strategy which are greater than the passive buy-and-hold equal weighted portfolio of the respective six foreign currencies. The parametric paired t-test and the non-parametric Wilcoxon test is shown to test the statistical significance of the excess returns relative to the passive equal weighted long only portfolio, ** and * indicate statistical significance at the 1% and 5% levels, respectively.*

TABLE 9
Best Two Momentum Strategies For Each Currency
And The Impact of Transaction Costs
1980 to 1998

COUNTRY	STRATEGY DETAILS	STATISTICAL DIAGNOSTICS	No. of Ticks From Mid Point multiplied by four					
			0	5	10	15	20	25
ITALY	STRATEGY 1	Excess Return (%) after T.Costs	0.907	0.769	0.632	0.494	0.356	0.219
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	61.61%	61.14%	60.19%	60.19%	59.72%	55.45%
	6 Months	:paired t-test	3.337**	2.830**	2.322*	1.816	1.309	0.803
		:Wilcoxon test	4.620**	4.118**	3.562**	3.025**	2.476**	1.904*
ITALY	STRATEGY 2	Excess Return (%) after T.Costs	0.584	0.447	0.310	0.174	0.037	-0.100
	L2/S2	Prob > Passive Equal Weighted Portfolio (%)	67.80%	66.34%	62.44%	61.46%	59.02%	57.07%
	12 Months	:paired t-test	2.330*	1.783	1.238	0.692	0.148	-0.397
		:Wilcoxon test	4.792**	4.254**	3.673**	3.063**	2.429**	1.813*
U.K.	STRATEGY 1	Excess Return (%) after T.Costs	0.570	0.249	-0.072	-0.393	-0.714	-1.035
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	65.85%	56.59%	54.63%	51.22%	48.29%	45.37%
	12 Months	:paired t-test	2.272*	0.752	-0.216	-1.182	-2.145	-3.106
		:Wilcoxon test	4.388**	2.523**	1.398	0.245	-0.872	-1.987
U.K.	STRATEGY 2	Excess Return (%) after T.Costs	0.451	0.130	-0.191	-0.512	-0.833	-1.154
	L2/S2	Prob > Passive Equal Weighted Portfolio (%)	59.02%	56.59%	53.66%	49.27%	43.90%	39.02%
	12 Months	:paired t-test	2.330*	0.467	-0.684	-1.834	-2.981**	-4.126**
		:Wilcoxon test	4.792**	1.758*	0.400	-0.963	-2.404**	-3.869**
U.S.A.	STRATEGY 1	Excess Return (%) after T.Costs	0.429	0.274	0.118	-0.038	-0.193	-0.349
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	53.08%	52.13%	51.66%	51.18%	48.34%	46.45%
	6 Months	:paired t-test	1.484	0.946	0.408	-0.130	-0.668	-1.206
		:Wilcoxon test	2.228*	1.672*	1.128	0.278	0.007	-0.557
U.S.A.	STRATEGY 1	Excess Return (%) after T.Costs	0.491	0.335	0.179	0.023	-0.132	-0.288
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	55.14%	52.80%	50.93%	48.13%	46.26%	44.86%
	3 Months	:paired t-test	1.600	1.093	0.584	0.076	-0.432	-0.941
		:Wilcoxon test	2.021*	1.490	0.982	0.449	-0.112	-0.678
CANADA	STRATEGY 1	Excess Return (%) after T.Costs	0.673	0.466	0.310	0.154	-0.002	-0.157
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	58.33%	57.94%	55.14%	54.67%	53.27%	50.93%
	1 Month	:paired t-test	2.290*	1.588	1.057	0.526	-0.006	-0.538
		:Wilcoxon test	2.854**	2.315*	1.783*	1.195	0.635	0.067
CANADA	STRATEGY 1	Excess Return (%) after T.Costs	0.561	0.480	0.399	0.318	0.237	0.156
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	58.41%	58.41%	57.01%	55.14%	54.67%	54.21%
	3 Months	:paired t-test	1.896998	1.623	1.349	1.075	0.801	0.527
		:Wilcoxon test	2.678**	2.398**	2.113*	1.834*	1.558	1.262

JAPAN	STRATEGY 1	Excess Return (%) after T.Costs	0.348	0.207	0.065	-0.076	-0.218	-0.359
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	51.18%	48.82%	47.87%	47.39%	46.92%	44.08%
	6 Months	:paired t-test	1.095	0.650	0.205	-0.239	-0.683	-1.127
		:Wilcoxon test	1.505	1.006	0.320	-0.061	-0.545	-1.023
JAPAN	STRATEGY 1	Excess Return (%) after T.Costs	0.454	0.313	0.173	0.032	-0.108	-0.248
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	50.47%	49.07%	47.66%	47.20%	46.26%	44.39%
	3 Months	:paired t-test	1.444	0.996	0.549	0.103	-0.342	-0.785
		:Wilcoxon test	1.496	0.999	0.477	-0.034	-0.542	-1.023
GERMANY	STRATEGY 1	Excess Return (%) after T.Costs	0.665	0.557	0.449	0.341	0.233	0.126
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	57.35%	56.87%	54.98%	54.98%	53.55%	52.61%
	6 Months	:paired t-test	2.398*	2.008*	1.618	1.229	0.841	0.452
		:Wilcoxon test	3.444**	3.057**	2.627**	2.222*	1.793*	1.415
GERMANY	STRATEGY 1	Excess Return (%) after T.Costs	0.323	0.214	0.106	-0.003	-0.111	-0.220
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	59.02%	57.07%	54.63%	54.15%	53.17%	52.68%
	12 Months	:paired t-test	1.059	0.703	0.347	-0.009	-0.365	-0.721
		:Wilcoxon test	3.007**	2.630**	2.217*	1.808*	1.427	1.008
FRANCE	STRATEGY 1	Excess Return (%) after T.Costs	0.725	0.692	0.659	0.626	0.593	0.560
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	63.51%	62.56%	62.09%	62.09%	60.66%	60.19%
	6 Months	:paired t-test	2.613**	2.494**	2.375**	2.256*	2.137*	2.018*
		:Wilcoxon test	4.182**	4.056**	3.933**	3.817**	3.698**	3.586**
FRANCE	STRATEGY 1	Excess Return (%) after T.Costs	0.744	0.711	0.678	0.645	0.612	0.579
	L1/S1	Prob > Passive Equal Weighted Portfolio (%)	61.68%	60.75%	60.28%	59.81%	58.88%	58.41%
	3 Months	:paired t-test	2.784**	2.660**	2.536*	2.412*	2.288*	2.165*
		:Wilcoxon test	3.631**	3.505**	3.386**	3.254**	3.116**	3.000**

Table 9 estimates the impact of transaction costs on the best two momentum strategies of each currency in the 1980 to 1998 period. These estimates assume four transactions occur at the end of each month, that is, the two currencies open are closed and another two currencies are entered into in order to construct the following month's currency long/short exposure.

TABLE 10

Performance of Strategy One with Consolidated Look back Rankings
Source of Momentum: Interest Adjusted Returns

	USD	GBP	CAD	JPY	DEM	FFR	ITL	EUR
1980 to 1998 - 1 to 18 Month Rankings Consolidated into 1 Ranking								
Excess Return (%)	0.185%	0.572%	0.317%	0.542%	0.648%	0.793%	0.966%	NA
Prob > Passive Equal Weighted Portfolio (%)	56.28%	59.80%	63.32%	54.77%	60.80%	64.82%	66.33%	NA
:paired t-test	0.561	1.609	0.957	1.593	2.183*	2.755**	3.372**	NA
:Wilcoxon test	1.635	3.286**	2.215*	2.224*	3.559**	4.081**	4.822**	NA
1980 to 1998 - 1 to 12 Month Rankings Consolidated into 1 Ranking								
Excess Return (%)	0.522%	0.684%	0.704%	0.668%	0.924%	0.966%	1.101%	NA
Prob > Passive Equal Weighted Portfolio (%)	59.80%	59.80%	65.33%	56.28%	64.32%	68.84%	67.84%	NA
:paired t-test	1.638	2.039*	2.350*	1.995*	3.171**	3.258**	3.673**	NA
:Wilcoxon test	2.619**	3.306**	3.105**	2.293*	4.797**	5.061**	5.452**	NA
1999 to 2004 - 1 to 18 Month Rankings Consolidated into 1 Ranking								
Excess Return (%)	1.900%	2.833%	2.360%	1.259%	NA	NA	NA	2.779%
Prob > Passive Equal Weighted Portfolio (%)	72.73%	79.07%	70.45%	72.09%	NA	NA	NA	79.070%
:paired t-test	3.558**	5.092**	4.304**	1.334	NA	NA	NA	4.470**
:Wilcoxon test	3.278**	5.057**	3.922**	3.174**	NA	NA	NA	4.444**
1999 to 2004 - 1 to 12 Month Rankings Consolidated into 1 Ranking								
Excess Return (%)	2.422%	3.008%	2.326%	1.810%	NA	NA	NA	2.860%
Prob > Passive Equal Weighted Portfolio (%)	79.59%	77.55%	70.45%	63.27%	NA	NA	NA	85.714%
:paired t-test	5.909**	5.336**	4.272**	3.833**	NA	NA	NA	5.198**
:Wilcoxon test	4.707**	5.446**	5.191**	3.663**	NA	NA	NA	4.999**

*Table 10 presents the results of Strategy One with the rankings of all the various look back periods consolidated into one ranking set. The active strategy's excess return were measured against a passive long only equal weighted portfolio of the respective six foreign currencies. The statistical significance of excess returns was evaluated using the paired t-test and the non-parametric Wilcoxon test. The results in Table 10 are free of transaction costs, ** and * indicate statistical significance at the 1% and 5% levels, respectively.*

TABLE 11
Bootstrap Simulation Results
Strategy One
Source of Momentum: Interest Adjusted Returns

	USD	GBP	CAD	JPY	DEM	FFR	ITL	EUR
1980 to 1998 - 1 to 18 Month Rankings Consolidated into 1 Ranking								
Excess Return (%) Average	-0.090%	0.013%	0.010%	-0.045%	-0.112%	0.019%	0.150%	NA
Information Ratio	-0.023	0.004	0.002	-0.012	-0.029	0.005	0.039	NA
Prob Active Strategy > Passive Portfolio	49.70%	51.08%	51.01%	48.06%	49.32%	51.32%	53.07%	NA
1980 to 1998 - 1 to 12 Month Rankings Consolidated into 1 Ranking								
Excess Return (%) Average	-0.089%	0.013%	0.008%	-0.046%	-0.115%	0.017%	0.143%	NA
Information Ratio	-0.022	0.004	0.002	-0.012	-0.030	0.005	0.038	NA
Prob Active Strategy > Passive Portfolio	49.75%	51.05%	50.99%	48.03%	49.31%	51.31%	53.00%	NA
1999 to 2004 - 1 to 18 Month Rankings Consolidated into 1 Ranking								
Excess Return (%) Average	-0.004%	0.325%	0.350%	-0.311%	NA	NA	NA	0.169%
Information Ratio	-0.001	0.096	0.102	-0.084	NA	NA	NA	0.046
Prob Active Strategy > Passive Portfolio	50.86%	54.28%	55.69%	47.02%	NA	NA	NA	51.92%
1999 to 2004 - 1 to 12 Month Rankings Consolidated into 1 Ranking								
Excess Return (%) Average	-0.017%	0.305%	0.337%	-0.317%	NA	NA	NA	0.159%
Information Ratio	-0.004	0.090	0.098	-0.085	NA	NA	NA	0.044
Prob Active Strategy > Passive Portfolio	50.66%	53.82%	55.52%	46.79%	NA	NA	NA	51.95%

Table 11 illustrates the summary results based on 1,000 bootstrap simulations that replicate the 1980 to 1998 period and the 1999 to 2004 period. The bootstrap replications were sourced from the original dataset, however, the assumption of i.i.d. returns is imposed whereby any autocorrelation structure in the time series is ignored. The simulations are based on zero transaction costs.

LISTING OF DISCUSSION PAPERS - 2003

Valadkhani A, History of Macroeconomic Modelling: Lessons from Past Experience, No 131, January 2003

Valadkhani A, Long and Short-Run Determinants of Money Demand in New Zealand: Evidence from Co Integration Analysis, No 132, January 2003

Anderson J, Optimal F and Portfolio Return Optimisation in US Futures Markets, No 133, January 2003

Anderson J, A Test of Weak-Form Market Efficiency in Australia Bank Bill Futures Calendar Spreads, No 134, January 2003

Aruman S, The Effectiveness of Foreign Exchange Intervention in Australia: A Factor Model Approach with GARCH Specifications, No 135, January 2003

Lahiri R, A Further Exploration of Some Computational Issues in Equilibrium Business Cycle Theory, No 136, February 2003

Valadkhani A, How Many Jobs Were Lost With the Collapse of Ansett? No 137, February 2003

Drew M E, Naughton T, & Veerarghavan M, Is Idiosyncratic Volatility Priced? Evidence from the Shanghai Stock Exchange, No 138, February 2003

Valadkhani, A, Does the Term Structure Predict Australia's Future Output Growth? No 139, February 2003

Worthington A, & Higgs H, A Multivariate GARCH Analysis of the Domestic Transmission of Energy Commodity Prices and Volatility: A Comparison of the Peak and Off-peak Periods in the Australian Electricity Spot Market, No 140, February 2003

Li S, The Estimation of Implied Volatility from the Black-Scholes Model: Some New Formulas and Their Applications, No 141, February 2003

Drew M E, & Stanford, J D, Principal and Agent Problems in Superannuation Funds, No 142, March 2003

Li S, A Single-Period Model and Some Empirical Evidences for Optimal Asset Allocation with Value-at-Risk Constraints, No 143, March 2003

Valadkhani A, An Empirical Analysis of the Black Market Exchange Rate in Iran, No 144, April 2003

Worthington A, Business Expectations and Preferences regarding the Introduction of Daylight Saving in Queensland, No 145, May 2003

Worthington A, Losing Sleep at the Market: An Empirical Note on the Daylight Saving Anomaly in Australia, No 146, May 2003

Robinson M, Tightening the Results/Funding Link in Performance Budgeting Systems, No 147, May 2003

Worthington A, & Higgs H, Risk, Return and Portfolio Diversification in Major Painting Marketing: The Application of Conventional Financial Analysis to Unconventional Investments, No 148, June 2003

Valadkhani A, Demand for M2 in Developing Countries: An Empirical Panel Investigation, No 149, July 2003

Worthington A, & Higgs H, Modelling the Intraday Return Volatility Process in the Australia Equity Market: An Examination of the Role of Information Arrival in S & PASX Stocks, No 150, July 2003

Lahiri R, Tax Distortions in a Neoclassical Monetary Economy in the Presence of Administration Costs, No 151 September 2003

Layton A, & Smith D, Duration Dependence in the US Business Cycle, No 152, August 2003

Valadkhani A, & Layton A, Quantifying the Effect of GST on Inflation in Australia’s Capital Cities: An Intervention Analysis, No 153, September 2003

Worthington A, & Valadkhani A, Measuring the Impact of Natural Disasters on Capital Markets: An Empirical Application Using Intervention Analysis, No 154, September 2003

Robinson M, The Output Concept and Public Sector Services, No 155, September 2003

Worthington A, Brown K, Crawford M, & Pickernell D, Socio-Economic and Demographic Determinants of Household Gambling in Australia, No 156, September 2003

Worthington A, & Higgs H, Tests of Random Walks and Market Efficiency in Latin American Stock Markets: An Empirical Note, No 157, September 2003

(Replacing Previous No 158) Worthington A, & Higgs H, Systematic Features of High-Frequency Volatility in Australian Electricity Markets: Intraday Patterns, Information Arrival and Calendar Effects, No 158, November 2003

Worthington A, & Higgs H, Weak-form Market Efficiency in European Emerging and Developed Stock Markets, No 159, September 2003

West T, & Worthington A, Macroeconomic Risk Factors in Australian Commercial Real Estate, Listed Property Trust and Property Sector Stock Returns: A Comparative Analysis using GARCH-M, No 160, October 2003

Lee B, Interstate Comparison of Output and Productivity in the Australian Agricultural Sector – 1991 – 1999, No 161, October 2003

McCarthy S, Hedging Versus not Hedging: Strategies for Managing Foreign Exchange Transaction Exposure, No 162, November 2003

Worthington A, Emergency Finance in Australian Households:
An Empirical Analysis of Capacity and Sources, No 163, November 2003

Worthington C, Debt as a Source of Financial Stress in Australian Households, No 164, November 2003

Robinson M, The Australian Budgeting System: On the Cusp of Change, No 165, November 2003

Lahiri R, Cooperation v/s Non-cooperation in R&D Competition with Spillovers, No 166, December 2003

Wolff R, Yao Q, & Tong H, Statistical Tests for Lyapunov Exponents of Deterministic Systems, No 167, December 2003

Wolff R, Barnett A, A Time Domain Test for Some Types of Non-Linearity, No 168 December 2003

LISTING OF DISCUSSION PAPERS - 2004

Drew M, Veeraraghavan M, Ye M, Do Momentum Strategies Work? - Australian Evidence, No 169, January 2004

Drew M, Mallin M, Naughton T, Veeraraghavan M, Equity Premium: - Does it Exist? – Evidence from Germany and United Kingdom, No 170, January 2004

Layton A, Valadkhani A, Measures of National Export Price Volatility Based on the Capital Asset Pricing Model, No 171, January 2004

Drew M, Marsden A, Veeraraghavan M, Small Firm Effect, Liquidity and Security Returns: Australian Evidence, No 172, February 2004

Drew M, Stanford J, Portability of Superannuation Balances, No 173, March 2004

Drew M, Naughton T, Veeraraghavan M Pricing of Equities in China: Evidence from the Shanghai Stock Exchange No 174, May 2004

Valadkhani A, Worthington A, Layton A, An Analysis of the Rising Cost of Education in Australia, No 175, April 2004

Li S, Worthington A, The Relationship Between The Adoption of Internet Banking and Electronic Connectivity: - An International Comparison, No 176, May 2004

Drew M, Marsden A, Veeraraghavan M, Does Idiosyncratic Volatility Matter? – New Zealand Evidence, No 177, May 2004

Guégan D, How Can We Dane the Concept of Long Memory? - An Econometric Survey, No 178, April 2004

Clements A, Hurn S, White S, Discretised Non-Linear Filtering for Dynamic Latent Variable Models: with Application to Stochastic Volatility No 179, May 2004

McCarthy S, Ispriani A, An Operating/Economic Exposure Australian Case Study: Foster's Group Limited Discussion Paper No 180, May 2004

Lahiri R, On Skill Heterogeneity and Inflation, Discussion Paper No 181, June 2004