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TECHNICAL ANALYSIS: AN ASIAN PERSPECTIVE



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Technical Analysis: An Asian Perspective

Abstract

Technical analysis, namely the moving average rule and the channel rule, is applied to the currency of an Asian managed floating exchange rate regime (USD/SGD) to see if opportunities for profitable trading exist. Instead of using only daily or monthly data, higher frequency time frames of 10, 15, 30 and 60 minutes are analyzed. Profitable strategies (if any) will be broken down and analyzed within smaller time frames to see if the profits are specifically in sample.

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Chapter 1: Introduction

It has been conjectured by several academics that significant profits can be made in the currency markets using simple technical analysis rules like moving average crossovers and filter rules. Numerous technical analysis studies have been done on the major currencies but seldom in Asian currencies. This may be due to the fact that most Asian currencies impose certain capital controls and needs for offshore liquidity are met by mostly non deliverable forwards, whose liquidity might be suspect. Only a handful of studies (Martin, 2001; Pukthuanthong-Le, Levich and Thomas, 2007; de Zwart et al., 2009; Lee et al., 2001) have attempted to look at technical analysis in emerging markets.

The reason why we're looking at technical analysis in the foreign exchange market (as opposed to the stock or commodities markets) is that unlike equity models, there is actually less confidence in currency valuation models (Frankel and Rose, 1995; Taylor 1995b; John Y. Campbell, Andrew W. Lo and A. Craig MacKinlay 1996). In equity models you could possibly value a company by discounting its future cash flows, but how then, do u exactly value a country (or in the case of the Euro, several countries)? Also, while a company could go bankrupt and shares of an individual stock could plummet to zero, the occurrence is less conceivable for a single currency. In addition, trading horizons are often shorter for foreign exchange traders (Allen and Taylor, 1990; Taylor and Allen, 1992) with most of them only participating in intraday trading and it has been shown by Menkhoff and Taylor (1997) and Oberlechner (2001) that

the shorter the trading horizon, the more likely it is that traders will use technical analysis to guide their decisions. This is complemented by the findings by Sarno and Taylor (2002) and Cheung, Chinn, and Garcia Pascual (2005) that fundamental exchange rate models fail at shorter term horizons. These suggest that use of technical analysis would be more popular in the currency markets as compared to other markets.

Several explanations have been given for this apparent inefficiency of excess profits, including spurious effects (data snooping, data mining or publication bias), behavioral biases, inadequate risk measuring techniques, and intriguingly, central bank intervention. It was argued the central banks have objectives that might not be profit maximizing in nature, like smoothing excess volatility, and this allows market participants to profit at its expense, as proposed by Dooley and Shafer (1983, p. 65), Levich (1985), and Sweeney (1986). In fact, the link between central bank intervention and supernormal profits has been tested in some papers, with most of the earlier papers reporting a significant positive correlation (Szakmary and Mathur, 1997; LeBaron, 1999). The principle behind abnormal profits and central bank intervention can be summed up in the following statement by Saacke (2002, p. 467)

“After an exogenous shock to fundamentals, the exchange rate would, without central bank interventions, jump to a new equilibrium level (e.g. Dornbusch overshooting). Wishing to reduce volatility, central banks try to prevent the exchange rate from jumping by leaning against the wind. Thereby they delay the adjustment of the exchange rate. If adjustment is delayed, exchange rates will display a trend during the

phase of adjustment. This trend may then be picked up and exploited by trend-following forecasters.”

Therefore, this study aims to provide more insight on the usefulness of technical analysis in an emerging market currency with frequent central bank intervention. For this purpose, we decide to apply technical analysis on Sing Dollar data, which fulfils all the criteria listed above.

The contribution of this study to the literature is fourfold. Firstly, the study is one of the few studies to apply technical analysis in an Asian context. As written by Kim and Nofsinger (2008), there is some evidence – anecdotal, theoretical, and empirical – that Asians suffer from cognitive biases on a different level than people of other cultures. They also mentioned that anecdotally, individual investors in Asia are often seen as mere gamblers. Technical analysis on an Asian currency therefore could yield interesting insights

Secondly, most of the technical analysis studies done had focused on the majors and cross rates, which are mostly freely floating currency regimes. Only Martin (2001), de Zwart et al. (2009) and Pukthuanthong-Le, Levich and Thomas (2007) have looked at managed floating regimes but none, strangely, at the Sing Dollar. Central banks intervene in managed floating regimes more frequently than freely floating regimes and therefore technical analysis is supposed to be more effective, according to the theory that intervention results in excess profits from technical analysis.

Thirdly, most of the studies done thus far have focused on technical analysis using daily data. However, since trading horizons of currency traders are usually shorter, with many of them taking only intraday positions; it is a wonder that not more studies have been done on shorter time intervals. This study shall focus on time intervals of 10, 25, 30 and 60 minutes, as well as daily data. To my knowledge, this is also the first study that analyzes multiple time frames for a single currency.

Lastly, this study can be seen as a true out of sample test for studies like Szakmary and Mathur (1997), Saacke (2002) and Taylor (1994), considering that this study is done on different time frames, in a different market and in a different time period.

Chapter 2: Asian currencies

Asian countries have adopted a variety of exchange rate regime to suit their domestic and economic needs, with pegged systems (Hong Kong) and free floats (Japan).

However most Asian countries uses managed floating exchange rate regimes in its various forms, with liquidity provided offshore by non deliverable forwards for countries with restrictions on foreign capital movements. Theoretically, technical analysis rules should perform better in managed float systems should central bank intervention induce profitability. Table 1 lists the exchange rate policies of East Asia according to 4 general categories – pegged, crawling peg, managed float and free float.

Table 1. Exchange Rate Policies of East Asia

Economy Exchange Rate Policy

Cambodia	Managed Float
China	Crawling Peg
Hong Kong	Pegged
Indonesia	Managed Float
Japan	Free Float
Laos	Managed Float
Malaysia	Managed Float
Philippines	Free Float
Singapore	Managed Float
South Korea	Free Float
Taiwan	Managed Float
Thailand	Managed Float
Vietnam	Crawling Peg

Source: International Monetary Fund, De Facto Classification of Exchange Rate Regimes and Monetary Policy Framework, [<http://www.imf.org/external/np/mfd/er/2006/eng/0706.htm>].

In addition, most Asian countries impose certain capital controls and needs for offshore trading is fulfilled by non deliverable forwards. A non deliverable forward works in a similar way to normal deliverable forwards, only that no physical

settlement of the currency takes place at maturity. Instead, counterparties settle the difference between the contracted price and fixing price with US dollars. Non deliverable forwards could be similar, but might not necessarily be equivalent to onshore spot rates net of interest rate differentials as prices are affected by supply and demand, liquidity, counterparty risk and speculative views on the fixing rates (Laura Lipscomb (2005)). Non deliverable forwards are over the counter products and hence there are no central clearing markets and therefore the availability of price data is severely limited. With the exception of Singapore, Hong Kong and Thailand, non deliverable forwards are adopted for offshore currency trading in Asian countries excluding Japan. Of these, Hong Kong is using a linked exchange rate system, under which the Hong Kong Monetary Authority intervenes to keep the exchange rate between 7.75 and 7.85 Hong Kong dollars and Thailand only lifted its capital control measures in 2008. Therefore, the focus of our attention shall be on the Sing dollar.

The management of the Sing dollar band can be summarized below.

‘The MAS operates a managed float regime for the Singapore dollar. The trade-weighted exchange rate is allowed to fluctuate within an undisclosed policy band, rather than kept to a fixed value. The band provides flexibility for the system to accommodate short term fluctuations in the foreign exchange markets as well as some buffering the estimation of the country’s equilibrium exchange rate, which cannot be known precisely. MAS intervention operations generally ‘lean against the wind’. If the exchange rate moves outside the band, MAS will usually step in, either buying or selling foreign exchange sp as to steer the exchange rate back within the band’ –MAS

Chapter 3: Technical Analysis – a brief overview

Technical analysis is actually a confounding term. Although decisions are based on seemingly technical and numerical indicators like price and oscillating indicators etc, the underlying belief is that it is mass market psychology driving price action and traders are basing decisions on this belief. Observing technical indicators is only the means to an end. In other words, technical analysis is not technical.

Technical analysis has a long history and dates back to Europe in the 17th century. In essence, it comprises of 3 tenets. Firstly, a technical analyst believes that market actions discount everything else and that all information is already incorporated into current prices. Secondly, prices move in trends, implying predictability of future prices. Lastly, history tends to repeat itself. This aspect is the most important, as it implies that excess profits could be made in the future by adopting a profitable strategy that worked in the past. It also implies that investors are not rational and that the efficient market hypothesis is not valid, even in its weak form, as prices should already reflect all past publicly available information.

There are various forms of technical analysis. The majority of technical analyses are detailed in textbooks like Murphy (1986, 1999) and Pring (1991). Technical analyst primarily uses two tools in making decisions – charting and technical indicators. Charting includes the drawing of trend lines, the formation of retracement levels etc and often requires no small amount of subjective judgment. A more detailed discussion on the subject can be found in the book by Bulkowski (2000). The focus of

this study will be on technical indicators, which on the other hand are based on concrete mathematical parameters that throw subjective judgment out of the window.

Basically, there are two types of technical indicators – momentum indicators and contrarian indicators. Momentum rules identifies trends and include indicators like moving averages crossovers (Cootner, 1962; Van Horne and Parker, 1967, 1968; James, 1968; Dale and Workman, 1980) and filter rules (Poole, 1967; Dooley and Shafer, 1976, 1984); Logue and Sweeney, 1977) while contrarian indicators identifies reversals and comprises of indicators like the relative strength index (J. W. Wilder, 1978; Henderson 2002) and stochastics. Of these, this study is going to concentrate on 2 trend following rules – moving average crossovers and channel rules.

Although technical analysis has its critics, its popularity in the financial markets cannot be disputed and it is still widely followed in the market. In the surveys by Allen and Taylor (1990) and Taylor and Allen (1992) they discovered that almost all currency traders based in London incorporate technical analysis into their decision making process. They also found out that technical and fundamental analysis is not mutually exclusive and the shorter the time frame, the more traders tend to rely on technical analysis. In fact, surveys show that 30% to 40% of foreign exchange traders around the world believe that technical analysis is the major factor determining exchange rates in the short run up to 6 months (e.g. Menkhoff, 1997; Gehrig and Menkhoff, 2003). Their survey is supported by the findings of Cheung and Chin (2001) and Cheung, Chin and Marsh (2004)

Chapter 4: Literature Review

Technical analysis might sound enticing on paper but how does it actually perform in reality? In a pioneering paper, Fama and Blume (1966) found no evidence of significant profits using a class of technical trading rules in the stock market. Their finds were backed up by Van Horne and Parker (1967, 1968) and Jensen and Benington (1970). However, more recent work by Brock, Lakonishok and LeBaron (1992) and Sullivan, Timmermann and White (1999) have refuted the idea. Other studies that found positive profits using technical analysis include studies by Menkhoff and Schlumberger (1995), Lee and Mathur (1996a, 1996b), Maillet and Michel (2000), Lee et al. (2001) and Martin (2001). In the paper by Park and Irvin (2007) they conclude that a majority of modern studies showed that technical trading strategies generated positive economic profits.

Most of the papers on technical analysis have focused on daily data while only a handful has taken an intraday approach. These papers include Curcio et al (1997), Neely and Weller (2003), Sager and Taylor (2004), Melvin, Sager and Taylor (2006) and Kozhan and Salmon (2010). The former two studies found no evidence of positive excess returns after transaction costs are considered. Using tick by tick data, Kozhan and Salmon found that excess profits exists for a trading rule in 2003 but these profits disappeared by 2008.

In addition, almost all studies on technical analysis in the foreign exchange market have focused on the majors with very few studies done on emerging markets/Asian

currencies. Anne D. Martin (2009) found statistically significant profits using the moving average rule on currencies of developing countries. However the rule does not outperform a risk free strategy after taking into account the Sharpe ratio. Gerben de Zwart et al. (2009) took a holistic approach by combining both fundamental and technical information to generate trading signals for 21 emerging currency markets and found economically and statistically significant positive risk-adjusted returns. Pukthuanthong-Le, Levich and Thomas (2007) found that while excess profits using trend following rules have disappeared over time, opportunities still exists in the exotic currencies.

One of the more significant paper relating central bank intervention to that of excess profits using technical analysis is that by LeBaron (1999). Using simple moving averages rules on 2 currencies (Deutsche Mark and Yen against the Dollar, he found significant profits of more than 5% annually. He then excluded days in his data where official interventions by the central bank took place and found out that the profits were reduced significantly. This study was complimented by that of Saacke (2002) who supplemented the earlier study by including interventions by the Deutsche Bundesbank and by adding more technical analysis rules. The results are consistent with the findings by Szakmary and Mathur (1997), where they also found a day of the week effect, where trading profits are generally higher on Fridays and Mondays, consistent with conjectures in previous studies where news concerning intervention tends to be revealed over weekends. Silber (1994) took a slightly different approach in that he linked markets where technical analysis proved profitable to markets where central bank intervention exists.

However, the above findings have been challenged by Neely (1998), who came up with a pertinent point – most of the observed profits occur concurrently with the period where intervention took place. This implies that there could be a positive correlation between intervention and positive profits but not necessarily causation, especially if interventions tend to occur during days when markets are trending or when volatility is excessive. In a follow up study, Neely (2002) found that intervention reacts to the same strong short-run trends from which the trading rules have recently profited using high frequency data.

In another study, Sapp (2004) found that market volatility is higher before interventions which in itself can be a plausible explanation for interventions. It also implies that the positive returns earned by technical analyst during this period are in fact an adequate compensation for risk bearing.

Finally, there has been some evidence that trading rule profits has been declining over time. LeBaron (2002) discovered that returns from MA trading rules declined during the 1990s. Olson (2004) found out that post 1970 returns declined to zero by the 1990s, using MA rule portfolios tested in successive five-year periods. Similarly, Schulmeister (2008) found that even profits from the best of 1024 technical trading rules has been declining since the 1980s and Pukthuanthong-Le, Levich and Thomas (2007) find that currencies for emerging markets tend to have more profit opportunities than developed nations. Finally, in a conclusive study, Neely, Weller and Ulrich (2009) conducted out of sample test on a variety of previously studied rules and concluded that simple technical trading rules were profitable up to the 1990s but

as knowledge of the usefulness of these rules became more and more widespread, profitability disappeared. The decline in the profitability of trading rule returns has been partly attributed to the rise in algorithmic trading. Kozhan and Salmon (2010) found that returns to a genetic algorithm that proved profitable in 2003 disappeared by 2008 and attributed the declining profitability to a rise in algorithmic trading over the same period. Their findings are backed up by Chaboud et al.(2009) who reported that algorithmic traders accounted for 60% of total trading volume in 2008 (whereas in 2003 they were almost nonexistent) in two currency markets.

Chapter 5: Data and Methodologies

In the section, the technicalities of the moving average rule and the support and resistance rules shall be explored. In the extensive literature on technical analysis, the moving average rule is especially prominent. (Neftci, 1991; Lee and Mathur, 1996a, 1996b; Neely, 1997; Szakmary and Mathur, 1997; Neely, 1998). The basis of the idea is that an upward trend is identifiable and a long position is taken when the short term moving average exceeds the long term moving average and similarly, a downward trend is identified and a short position is taken when the short term moving average goes lower than the long term moving average. Mathematically, the rule is expressed as

Where $P_{0,t}$ is the opening price of that period t while I = length of short term periods and J = length of long term periods. Since there is no one rigid rule as to what is usually used, we employ a combination of moving average rules to prevent our results from being dependent on one specific parameter setting (see Okunev and White, 2003). To this end, we test all scenarios where $I = 1, 2, 3, 4, 5, 6, 7, 8, 9$ and $J = 10, 15, 20, 25, 30, 50, 100$, a total of 63 combinations. Also, since we do not know what the optimal intraday time frame is, we use time intervals of 10, 15, 30 and 60 minutes, as well as daily returns. Whenever a signal is produced, a position is initiated using the price at

P_{ct}

the end of the period, . An example is provided below. For illustrative purposes, let I=2 and J =10.

Period	Opening Price	Closing Price	Short term average (2)	Long term average (10)	Position
7:00:00	73	74			
8:00:00	74	75	73.5		
9:00:00	76	79	75		
10:00:00	77	75	76.5		
11:00:00	74	75	75.5		
12:00:00	75	76	74.5		
13:00:00	78	80	76.5		
14:00:00	81	84	79.5		
15:00:00	82	85	81.5		
16:00:00	85	83	83.5	77.5	1
17:00:00	82	81	83.5	78.4	1
18:00:00	77	76	79.5	78.7	1
19:00:00	75	74	76	78.6	-1
20:00:00	73	71	74.5	78.3	-1

Therefore, in the example above, a long position at the price of 83 is taken on 1600 hours when the short term moving average exceeds the long term moving average. The long position is closed out at a price of 74 on 1900 hours when the short term moving average goes below the long term moving average. A corresponding short position at 74 is established at the same time.

Total percentage profit for a period can be calculated as

and

Where T equals to the transaction cost for a 1 way trade, that is, the transaction cost either squaring out the original position plus the transaction cost of entering a new position but not both. T is represented by the bid-ask spread with the spread estimated at 0.05% for a round trip (e.g. Levich and Thomas, 1993; Bessembinder, 1994; Lee and Mathur, 1996; Neely, 1997). However, spreads have improved over time due to

greater liquidity and technological advances. Therefore, 0.05% for a round trip in USDUSD can be considered conservative. The first term is equivalent to the profit/loss made on the position while the second term is the transaction costs incurred both ways. For comparison purposes, we shall include results based on profits without transaction costs.

Support and resistance, or channel rules are also widely popular (Irwin and Uhrig (1984), Taylor(1994). Much like the moving average rule, the rule alternates between a short or long position and is never neutral. Channel rules stipulates that when prices move to a new high or low, it is likely that prices will continue in that direction. For example, a long position at P_{ot} is established when the opening price in the current period P_{ot} exceeds the maximum price $P_{high,n}$ over the preceding N periods. The long position is closed out and reversed when the current opening

P_{ot}

price is lower than the low price $P_{low,n}$ over the preceding N periods.

A short position is therefore taken at P_{ot} . The cycle goes on until the end of the examination period. Mathematically, the rule is expressed as

$P_{high,tN}$

,...)

Flow

,...)

otherwise

The third term of the rule states that the position is held till a position of the opposite sign is signaled, which is consistent with the original work done by Donchian (1960). As with the moving average rule, the choice of N is varied to prevent out results from being dependent on any one specific parameter setting. Therefore, we chose values of 5, 10, 15, 20.....100 with differences of 5. An example is provided below. For illustrative purposes, let N=5.

Period	Opening Price	High Price	Low Price	High over previous 5 periods	Low over previous 5 periods	Position	Entry Price
7:00:00	74	75	74				
8:00:00	76	76	75				
9:00:00	74	76	73				
10:00:00	77	77	75				
11:00:00	74	74	72				
12:00:00	73	75	72	77	72	-	
13:00:00	78	78	74	77	72	1	78
14:00:00	80	81	80	78	72	1	-

15:00:00	80	82	80	81	72	1	-
16:00:00	84	85	83	82	72	1	-
17:00:00	81	82	81	85	72	1	-
18:00:00	77	77	76	85	74	1	-
19:00:00	75	75	74	85	76	-1	75
20:00:00	73	73	71	85	74	-1	-

In the example above, a position is taken on 1300 hours when the current opening price $P_{o,t}$ exceeds the maximum price during the preceding 5 periods, i.e. 77. The entry price is also 77. The position is squared out at a price of 75 when the opening price fell to 75 on 1800 hours when 75 became lower than the low price (76) of the preceding 5 periods. A corresponding short position is also established at 75.

Total percentage profit for a period can be calculated as

and

Where similarly, T equals to the transaction cost for a 1 way trade and the first term equals the profit/loss made on the position while the second term is the transaction costs incurred both ways. For comparison purposes, we shall include results based on profits without transaction costs.

Numerous studies on the distribution of short term assets returns have shown that prices are rarely normally distributed, with their distribution normally (no pun intended) being skewed and leptokurtic. Therefore, other than a t-test, the non-parametric sign rank test is employed to test the statistical significance of the returns.

An out of sample test is warranted if one considers the varied parameter settings and the possible scenarios above. It is highly probable that at least one will produce significant profits by chance or luck alone. However, instead of implementing a strict out of sample test, what this study does it break up profitable rules (if any) that work in certain periods into smaller sub periods. This could give us further clues into why certain rules work in certain periods. For example, learning (Lo, 2004) could extinguish earlier gains or the moving average rules works in every year except the height of the financial crisis due to increased volatility. Insights like there could be gleaned from breaking up the data into smaller periods.

Spot rates for USDSGD were obtained from Bloomberg. Only traded rates are captured. For intraday data, 10, 15, 30 and 60 minutes data were utilized from January 8 2008 to January 8 2011. For daily data, we utilize the data from January 1 2000 to 3 January 2011.

Chapter 6: Results

A look at the results show that the profits are mostly either negative or non significant. The results are characterized by non zero skewness and high kurtosis levels, effectively meaning that the distributions are non normal, which renders the sign-rank test better than the t-test.

Table 2 to 6 in Appendix 1 report the in sample test of the moving average rule profitability within time frames of 10 minutes, 15 minutes, 30 minutes 60 minutes plus daily data, with the results broken down into a yearly analysis. The cells highlighted in pink either means that the profits are positive or that the results are significant at the

95% confidence interval. Some of the MA specifications produce astoundingly positive and significant results but in almost all instances profitability disappears after transactions costs are included. For example the moving average specification of 1,10 ($I=1$, $J=10$) produce a significant return of 29.80% yearly but the profits disappeared when transaction costs are included. However, there are several exceptions within the daily time frames where there are certain rules where positive and significant returns remain after transaction costs are included. However, the best of these rules only produce a return of 2.72% annually, which is hardly anything to shout about. In addition, the results do not hold after breaking down the profitable period into smaller samples.

Moving on to the channel rule, it can be seen from table 7 to 11 in Appendix 2 that profitability is practically nonexistent. The few specifications with positive profits are not in any sense significantly different from zero, with or without transactions costs. As there are no profitable rules, a dissection of the observed period into smaller sub samples is not needed.

In a further analysis of the results from our moving average results, we separate the profits from long and short positions and the average number of periods a long/short position is held to see if any significant differences exist. The results are then compared to the MAS policy during the period to see if it coincides with the direction the central bank is taking during the relevant period.

Table 12 to 15 in Appendix 3 illustrates the profit of long and short positions of the shorter time frames and the relevant T stats and sign ranked test results. Also included

is the average/total number of time periods each position is held, as well as the number of such positions. The cells highlighted in green means a positive profit was observed while the cells highlighted in yellow means that the results are significant at the 95% confidence interval. Of more interest are the results from the daily time frames in table 16, and this is where we will concentrate our attention.

From table 17 in Appendix 4, it can be seen that MAS has adopted a policy of gradual and modest appreciation till mid 2001. It can be seen that although the profits of longs is more than the profits of shorts most of the time in that period, especially in 2011, there is no consistent significance across the results. Also interesting is the fact that long positions are held, on average, longer than short positions, suggesting that MAS policy of a stronger SGD did not translate into short term strength for the currency (since we measure the prices in USD/SGD and not the SGD NEER itself) and that the central bank was consistently ‘fighting’ against the market.

Thereafter, a policy of zero appreciation was adopted till April 2004. Such a policy is likely to result in no bias between short and long positions but it can be seen in table 16 that the profits of shorts are slightly more than that of longs, though again the results are not significant across the board. In this period, the numbers of days short positions are held are far longer than the days a long position is held, suggesting consistent SGD strength (USD/SGD weakness) in the short term vs the long term. Although the policy of the central bank is for a neutral movement of the SGD NEER, this evidence suggest that MAS have to consistently fight against strong term strength in the SGD NEER.

After the earlier part of 2004, MAS decided to re-adopt a policy of gradual and modest appreciation to combat inflation till October 2007, after which a slightly higher slope was introduced till Oct 2008, when a zero percent appreciation stance was needed to fight the full effects of the global financial crisis. In such a scenario one would expect the profits and number of days of shorts is held to be significantly higher than that of longs, especially in the latter part. From table 16 it can be seen that apart from 2005 (where the profits of shorts and longs are often sparse and random) and 2008 (where both short and long positions seemed to be consistently profitable) the direction of profitable positions during 2004, 2006 and 2008 clearly leaned towards shorts, although again no consistent significance was seen. In this particular instance, it seemed like that market was obliging towards the central bank wishes of a stronger SGD (and weaker USD/SGD). In addition, in the same periods (2004, 2006 and 2007) the length of time a short position is held is consistently longer than that a long position is held

The onset of the financial crisis meant that the central bank leaned away from a policy of SGD appreciation in end 2008 and towards a neutral policy until April 2010, where a policy of modest and gradual appreciation was introduced for 6 months before the central bank increased slightly the slope of the SGD NEER again. However, once again there was no evidence of the outperformance of long positions over short positions and vice versa in either 2008 or 2009. However, the results from 2010 clearly showed that once again, the profits of short positions is higher than that of long positions, suggesting the SGD strength and USD/SGD weakness has once again

kicked in. In addition, the length of time a short position is held is higher than that of long positions again.

All in all, evidence of consistent outperformance of one position over the other during different policy periods is mixed at best. Although there are some years where short positions outperformed longs, the results are mostly not significant in terms of either the sign rank test or the T statistic. Also, outperformance of shorts vs longs in a climate of SGD NEER appreciation, or in a period of zero appreciation for the matter, is not consistent across either strategies or all periods.

Chapter 7: Discussion and Conclusion

The results of this study show that trend following strategies like the moving average rule and the channel rule produce unremarkable results at best, and even positive profits disappear out of the original sample. These results are consistent with studies done by Lee and Mathur (1996a) Lebaron (2002) and Olson (2004) that it is no longer possible to make excess profits using trend following rules in currency markets. There could be three reasons for this. Firstly, it could be that the efficient market hypothesis

holds and that it is simply impossible to achieve positive excess returns using indicators based on past prices. The second reason could be that profits existed in the past but was eroded due to the growth in the hedge fund industry and the rise of algorithmic trading. Finally, it could be just a trick of time, that is, trend following rules worked well in the past because coincidentally markets could be trending up to the 1990s(when they could still make money) but stopped trending in from the late 1990s.

What next then? Instead of looking at simple mechanical rules like filter rules and moving averages, more studies could be done on more complex indicators like the moving average convergence divergence (MACD) rule or the rate of change (ROC) rule. Also, since markets no longer seem to be trending, it could be worthwhile to look at contrarian strategies instead, like the relative strength index (RSI) and stochastics to identify overbought and oversold levels. Indeed, this could be an interesting topic, if one takes into account Neely's (1998, 2002) findings that trading profits using trend following strategies materialized before intervention occurred. This could imply that while he could be right that central bank intervention do not result in profitability of trend following rules, it could possibly result in the profitability of contrarian strategies, especially if you have the central bank to 'back' you up.

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TABLE 2		Without Transaction cost																												
Year	Strategy	1 10	2 10	3 10	4 10	5 10	6 10	7 10	8 10	9 10	1 15	2 15	3 15	4 15	5 15	6 15	7 15	8 15	9 15	1 20	2 20	3 20	4 20	5 20	6 20	7 20	8 20	9 20	1 25	2 25
2008	Profit[%]	0.00022	0.00028	0.00030	0.00017	0.00015	0.00002	-0.00002	0.00004	0.00015	0.00009	0.00014	-0.00004	-0.00025	-0.00019	-0.00029	-0.00020	-0.00012	-0.00009	-0.00006	0.00004	0.00006	-0.00008	-0.00010	-0.00016	-0.00019	-0.00009	-0.00015	0.00001	0.00011
	T Stats	0.30103	0.18993	0.16878	0.43546	0.49112	0.94231	0.93683	0.84956	0.49881	0.68000	0.50671	0.85330	0.25391	0.37086	0.18348	0.34176	0.57643	0.68485	0.79466	0.83880	0.77763	0.71855	0.65303	0.46134	0.36659	0.67352	0.47100	0.94615	0.61455
	Signed Ranked	0.30315	0.62680	0.88051	0.71316	0.60720	0.29186	0.25643	0.48925	0.72353	0.20977	0.40555	0.88786	0.02383	0.04065	0.03411	0.09718	0.12024	0.08969	0.02999	0.12596	0.24293	0.07432	0.09341	0.12668	0.08707	0.18169	0.07948	0.14270	0.29598
2009	Profit[%]	-0.00016	-0.00019	-0.00018	-0.00024	-0.00024	-0.00013	-0.00016	0.00001	0.00001	-0.00011	-0.00002	-0.00007	-0.00000	-0.00002	-0.00003	-0.00005	-0.00004	0.00001	0.00003	-0.00004	0.00002	0.00005	-0.00002	-0.00005	-0.00015	-0.00009	-0.00009	-0.00010	
	T Stats	0.37691	0.28594	0.31759	0.18767	0.18771	0.09166	0.36753	0.96293	0.96955	0.56337	0.89285	0.71984	0.88412	0.98711	0.90094	0.86437	0.80240	0.81186	0.95963	0.85536	0.81398	0.92954	0.78246	0.89655	0.79743	0.41454	0.61363	0.63639	0.57211
	Signed Ranked	0.00132	0.00147	0.00382	0.00508	0.01199	0.00304	0.06907	0.30937	0.48713	0.01091	0.06390	0.02995	0.13833	0.41993	0.45246	0.39450	0.31703	0.25712	0.07746	0.10302	0.06494	0.28520	0.37340	0.30179	0.22476	0.12669	0.13361	0.03538	0.02701
2010	Profit[%]	0.00022	0.00009	0.00012	-0.00003	-0.00013	-0.00018	-0.00023	-0.00019	-0.00011	-0.00016	0.00002	-0.00009	-0.00017	-0.00014	-0.00011	-0.00018	-0.00014	-0.00014	0.00003	0.00000	-0.00003	-0.00011	-0.00016	-0.00026	-0.00024	-0.00019	-0.00019	-0.00007	0.00005
	T Stats	0.19127	0.59889	0.46194	0.84844	0.45636	0.27977	0.17572	0.25572	0.53154	0.34943	0.92263	0.59936	0.32147	0.41736	0.50029	0.30231	0.39634	0.41901	0.86841	0.98782	0.88232	0.52238	0.34176	0.12754	0.14986	0.25389	0.27136	0.67541	0.77831
	Signed Ranked	0.13829	0.06129	0.23981	0.03080	0.00628	0.00441	0.00140	0.00674	0.04552	0.15332	0.04966	0.01669	0.00377	0.00538	0.01139	0.00631	0.01852	0.03643	0.05531	0.04057	0.04286	0.00861	0.01290	0.00343	0.00529	0.02508	0.01080	0.01723	0.20432
ALL	Profit[%]	0.00008	0.00005	0.00007	-0.00005	-0.00008	-0.00017	-0.00015	0.00000	0.00000	0.00003	0.00004	-0.00007	-0.00015	-0.00011	-0.00014	-0.00015	-0.00011	-0.00010	0.00002	0.00002	-0.00001	-0.00007	-0.00007	-0.00015	-0.00017	-0.00016	-0.00015	-0.00006	0.00001
	T Stats (Pr > t)	0.44691	0.67181	0.52861	0.61885	0.44376	0.11260	0.16731																						

3	25	4	25	5	25	6	25	7	25	8	25	9	25	1	30	2	30	3	30	4	30	5	30	6	30	7	30	8	30	9	30	10	30	11	30	12	30	13	30	14	30	15	30	16	30	17	30	18	30	19	30	20	30	21	30	22	30	23	30	24	30	25	30	26	30	27	30	28	30	29	30	30	30	31	30	32	30	33	30	34	30	35	30	36	30	37	30	38	30	39	30	40	30	41	30	42	30	43	30	44	30	45	30	46	30	47	30	48	30	49	30	50	30	51	30	52	30	53	30	54	30	55	30	56	30	57	30	58	30	59	30	60	30	61	30	62	30	63	30	64	30	65	30	66	30	67	30	68	30	69	30	70	30	71	30	72	30	73	30	74	30	75	30	76	30	77	30	78	30	79	30	80	30	81	30	82	30	83	30	84	30	85	30	86	30	87	30	88	30	89	30	90	30
0.00014	0.00006	-0.00005	-0.00008	-0.00018	-0.00012	-0.00019	-0.00016	-0.00004	0.00011	-0.00001	-0.00024	-0.00014	-0.00004	-0.00014	-0.00004	0.00001	-0.00008	-0.00005	-0.00009	-0.00014	-0.00014	-0.00002	0.00003	-0.00012	-0.00026	-0.00018	-0.00017	-0.00018	-0.00017	-0.00014	0.50339	0.78164	0.81919	0.41003	0.57931	0.38242	0.46553	0.86434	0.89257	0.59474	0.95074	0.26952	0.52000	0.84628	0.51092	0.87017	0.95204	0.72376	0.79904	0.67257	0.51835	0.52493	0.93690	0.89212	0.57386	0.23322	0.40453	0.43764	0.44962	0.29421	0.33153	0.40004	0.43817	0.50893	0.61676	0.29233	0.25360	0.11011	0.11066	0.07806	0.12539	0.13195	0.15102	0.46574	0.20125	0.03932	0.12078	0.35056	0.12401	0.34560	0.10340	0.03544	0.10314	0.10578	0.08592	0.07993	0.28499	0.32002	0.12492	0.02659	0.05624	0.07183	0.14233	0.10341	0.12762	0.19816	0.23870	0.24409																																																																																															
-0.00012	-0.00003	-0.00003	-0.00005	-0.00019	-0.00012	-0.00019	-0.00010	-0.00003	-0.00008	-0.00008	-0.00012	-0.00008	-0.00009	-0.00009	-0.00014	-0.00002	-0.00010	-0.00005	-0.00014	-0.00018	-0.00018	-0.00020	-0.00021	-0.00022	-0.00021	-0.00020	-0.00028	-0.00031	-0.00031	-0.00030	-0.00029	0.51339	0.85332	0.86113	0.77552	0.56475	0.50290	0.53646	0.59262	0.86792	0.66282	0.60652	0.50517	0.65830	0.60992	0.61415	0.96412	0.45013	0.89210	0.58908	0.79136	0.44064	0.32906	0.37317	0.27942	0.24250	0.23766	-0.06120	0.27563	0.12840	0.08766	0.09288	0.10203	0.11571	0.24107	0.09225	0.44490	0.32962	0.23503	0.17146	0.11659	0.12193	0.04379	0.11454	0.11778	0.23573	0.17390	0.18097	0.17731	0.18822	0.37328	0.02486	0.06450	0.06969	0.17683	0.09000	0.09101	0.12207	0.10180	0.10209	0.02735	0.04586	0.05370	0.04300	0.02228	0.02771	0.03288	0.03853	0.11427																																																																																														
0.00005	-0.00008	-0.00006	-0.00022	-0.00019	-0.00013	-0.00015	-0.00007	-0.00003	-0.00006	-0.00014	-0.00017	-0.00015	-0.00014	-0.00094	-0.00009	0.00001	0.00001	-0.00010	-0.00014	-0.00019	-0.00018	-0.00008	-0.00005	-0.00006	-0.00001	0.00008	0.00013	0.00010	0.00015	0.00010	0.00009	0.00014	0.00007	0.77786	0.63161	0.71907	0.20414	0.25213	0.43401	0.38567	0.70144	0.84997	0.75331	0.41211	0.30603	0.37547	0.40846	0.40993	0.58252	0.93789	0.93466	0.56118	0.40207	0.25119	0.29102	0.65337	0.76393	0.70173	0.96311	0.63008	0.42729	0.57463	0.39119	0.55436	0.59132	0.40073	0.68894	0.15849	0.04792	0.10337	0.01497	0.02821	0.08976	0.10551	0.03708	0.05268	0.04791	0.03439	0.30192	0.07905	0.11370	0.10781	0.21152	0.11950	0.11526	0.04161	0.09895	0.06589	0.10301	0.29139	0.41194	0.19712	0.34936	0.65323	0.82564	0.62064	0.81837	0.58662	0.56679	0.85500	0.51844																																																																																												
0.00001	-0.00001	-0.00006	-0.00016	-0.00015	-0.00016	-0.00015	-0.00006	-0.00003	-0.00002	-0.00010	-0.00019	-0.00014	-0.00011	-0.00014	-0.00005	-0.00006	-0.00005	-0.00010	-0.00011	-0.00018	-0.00018	-0.00010	-0.00009	-0.00015	-0.00016	-0.00011	-0.00008	-0.00012	-0.00014	-0.00014	-0.00014	-0.00011	-0.00011	0.90421	0.91000	0.57479	0.13578	0.15980	0.13826	0.15976	0.61156	0.80261	0.84514	0.37946	0.08150	0.20573	0.32722	0.21229	0.65960	0.59520	0.62776	0.36660	0.31532	0.10614	0.09249	0.34956	0.39079	0.17743	0.14251	0.33011	0.44575	0.26406	0.21295	0.19350	0.20955	0.32247	0.34184	0.02880	0.01906	0.02146	0.00166	0.00188	0.00244	0.00467	0.00658	0.00238	0.00851	0.00471	0.00576	0.00449	0.01714	0.00693	0.06587	0.00097	0.00080	0.00097	0.00312	0.00149	0.00206	0.02450	0.04503	0.03397	0.01155	0.00161	0.01022	0.00810	0.01687	0.01405	0.01178	0.01617	0.04114	0.03152																																																																																											

Transaction cost																														
Strategy																														
Year		1_10	2_10	3_10	4_10	5_10	6_10	7_10	8_10	9_10	1_15	2_15	3_15	4_15	5_15	6_15	7_15	8_15	9_15	1_20	2_20	3_20	4_20	5_20	6_20	7_20	8_20	9_20	1_25	2_25
2008																														
Profit(%)		-0.00915	-0.00673	-0.00591	-0.00565	-0.00563	-0.00586	-0.00629	-0.00718	-0.00953	-0.00739	-0.00537	-0.00472	-0.00456	-0.00431	-0.00424	-0.00404	-0.00401	-0.00404	-0.00650	-0.00472	-0.00395	-0.00369	-0.00342	-0.00332	-0.00324	-0.00310	-0.00311	-0.00574	-0.00411
T Stats		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Signed Ranked		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2009																														
Profit(%)		-0.00924	-0.00726	-0.00641	-0.00614	-0.00604	-0.00622	-0.00647	-0.00720	-0.00960	-0.00729	-0.00544	-0.00471	-0.00426	-0.00393	-0.00383	-0.00382	-0.00390	-0.00402	-0.00619	-0.00451	-0.00393	-0.00342	-0.00314	-0.00307	-0.00302	-0.00306	-0.00295	-0.00548	-0.00413
T Stats		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Signed Ranked		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2010																														
Profit(%)		-0.00870	-0.00675	-0.00591	-0.00580	-0.00579	-0.00599	-0.00643	-0.00725	-0.00952	-0.00702	-0.00553	-0.00473	-0.00436	-0.00416	-0.00405	-0.00405	-0.00400	-0.00407	-0.00621	-0.00466	-0.00394	-0.00360	-0.00347	-0.00339	-0.00329	-0.00312	-0.00309	-0.00565	-0.00407
T Stats		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Signed Ranked		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ALL																														
Profit(%)		-0.00904	-0.00693	-0.00609	-0.00588	-0.00583	-0.00604	-0.00642	-0.00723	-0.00957	-0.00726	-0.00546	-0.00473	-0.00440	-0.00414	-0.00404	-0.00398	-0.00398	-0.00405	-0.00631	-0.00464	-0.00396	-0.00357	-0.00335	-0.00327	-0.00319	-0.00311	-0.00306	-0.00564	-0.00412
T Stats		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Signed Ranked		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3_25	4_25	5_25	6_25	7_25	8_25	9_25	1_30	2_30	3_30	4_30	5_30	6_30	7_30	8_30	9_30	1_50	2_50	3_50	4_50	5_50	6_50	7_50	8_50	9_50	1_100	2_100	3_100	4_100	5_100	6_100	7_100	8_100	9_100
-0.00337	-0.00305	-0.00290	-0.00292	-0.00273	-0.00264	-0.00252	-0.00520	-0.00374	-0.00299	-0.00278	-0.00280	-0.00256	-0.00232	-0.00231	-0.00212	-0.00405	-0.00298	-0.00239	-0.00217	-0.00201	-0.00190	-0.00166	-0.00151	-0.00159	-0.00297	-0.00209	-0.00179	-0.00157	-0.00150	-0.00137	-0.00124	-0.00117	-0.00110
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
-0.00352	-0.00297	-0.00279	-0.00264	-0.00257	-0.00252	-0.00248	-0.00496	-0.00363	-0.00308	-0.00275	-0.00256	-0.00234	-0.00226	-0.00221	-0.00202	-0.00388	-0.00273	-0.00241	-0.00208	-0.00197	-0.00186	-0.00175	-0.00172	-0.00165	-0.00274	-0.00204	-0.00174	-0.00163	-0.00151	-0.00144	-0.00136	-0.00125	-0.00111
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
-0.00334	-0.00308	-0.00281	-0.00282	-0.00273	-0.00257	-0.00252	-0.00511	-0.00377	-0.00313	-0.00291	-0.00271	-0.00249	-0.00235	-0.00228	-0.00216	-0.00382	-0.00276	-0.00239	-0.00218	-0.00203	-0.00186	-0.00166	-0.00155	-0.00151	-0.00256	-0.00177	-0.00138	-0.00119	-0.00101	-0.00097	-0.00092	-0.00080	-0.00083
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
-0.00342	-0.00305	-0.00285	-0.00281	-0.00269	-0.00259	-0.00252	-0.00511	-0.00374	-0.00309	-0.00284	-0.00270	-0.00248	-0.00232	-0.00228	-0.00211	-0.00394	-0.00284	-0.00241	-0.00216	-0.00203	-0.00189	-0.00171	-0.00162	-0.00160	-0.00276	-0.00197	-0.00164	-0.00147	-0.00135	-0.00126	-0.00118	-0.00108	-0.00102
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	#NUM!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

TABLE 3																													
15 mins Without Transaction cost																													
Strategy																													
Year	1 10	2 10	3 10	4 10	5 10	6 10	7 10	8 10	9 10	1 15	2 15	3 15	4 15	5 15	6 15	7 15	8 15	9 15	1 20	2 20	3 20	4 20	5 20	6 20	7 20	8 20	9 20	1 25	2 25
2008																													
Profit(%)	-0.00002	0.00001	-0.00042	-0.00035	0.00004	-0.00004	-0.00010	-0.00015	-0.00018	0.00013	0.00009	-0.00019	-0.00015	-0.00029	-0.00047	-0.00012	-0.00021	-0.00024	0.00012	0.00018	-0.00011	-0.00018	-0.00005	-0.00011	0.00013	0.00009	-0.00002	-0.00012	0.00003
T Stats	0.94782	0.96356	0.18537	0.27096	0.90381	0.89721	0.74589	0.63265	0.57233	0.68448	0.76811	0.54553	0.64556	0.36422	0.14028	0.71620	0.51486	0.45957	0.70900	0.56790	0.72956	0.56708	0.88035	0.73189	0.67891	0.78834	0.94384	0.70626	0.92178
Signed Ranked	0.16544	0.19826	0.03038	0.04534	0.33045	0.16824	0.11206	0.18407	0.25657	0.28689	0.21665	0.08381	0.11367	0.11917	0.02522	0.23461	0.28759	0.19278	0.21043	0.28064	0.08057	0.05753	0.22413	0.27302	0.54171	0.43520	0.29730	0.06482	0.24859
2009																													
Profit(%)	-0.00010	-0.00041	-0.00029	-0.00028	-0.00024	-0.00021	-0.00008	-0.00011	-0.00022	-0.00014	-0.00022	-0.00005	-0.00012	-0.00017	-0.00030	-0.00027	-0.00040	-0.00048	-0.00018	-0.00018	-0.00010	-0.00006	-0.00005	-0.00012	-0.00023	-0.00027	-0.00012	-0.00012	-0.00024
T Stats	0.72067	0.12215	0.27429	0.29534	0.37571	0.43749	0.76898	0.68400	0.41030	0.59594	0.40249	0.86302	0.64611	0.51779	0.26393	0.30333	0.13452	0.06974	0.49047	0.48821	0.70055	0.83351	0.84635	0.66146	0.38297	0.31213	0.65165	0.64229	0.36954
Signed Ranked	0.02601	0.00351	0.04266	0.07136	0.11906	0.15339	0.43389	0.29988	0.37790	0.02174	0.02470	0.18190	0.20025	0.13661	0.08323	0.12699	0.04488	0.01493	0.03409	0.05002	0.15779	0.25781	0.30664	0.19434	0.16033	0.14932	0.36493	0.03581	0.03045
2010																													
Profit(%)	-0.00007	-0.00006	-0.00019	-0.00025	-0.00014	-0.00008	-0.00016	-0.00011	-0.00009	-0.00016	-0.00011	-0.00028	-0.00027	-0.00037	-0.00023	-0.00014	-0.00017	-0.00024	0.00000	-0.00017	-0.00018	-0.00007	-0.00016	-0.00016	-0.00007	0.00007	-0.00004	-0.00015	-0.00020
T Stats	0.78865	0.80525	0.44376	0.32822	0.57741	0.73869	0.52566	0.66010	0.72708	0.51870	0.67411	0.27245	0.28721	0.14964	0.35731	0.58337	0.51532	0.34590	0.99962	0.50464	0.48384	0.77739	0.52296	0.52294	0.77179	0.77627	0.87741	0.56468	0.43542
Signed Ranked	0.01098	0.00471	0.00369	0.00217	0.00626	0.03556	0.07812	0.23133	0.38827	0.00957	0.00566	0.00133	0.00300	0.00303	0.02031	0.08359	0.07373	0.05718	0.02995	0.01146	0.01184	0.06696	0.03644	0.04720	0.13998	0.34817	0.21349	0.01872	0.01675
ALL																													
Profit(%)	-0.00008	-0.00017	-0.00031	-0.00031	-0.00012	-0.00012	-0.00012	-0.00012	-0.00016	-0.00008	-0.00011	-0.00019	-0.00019	-0.00029	-0.00034	-0.00019	-0.00027	-0.00034	-0.00005	-0.00008	-0.00015	-0.00012	-0.00010	-0.00014	-0.00007	-0.00005	-0.00008	-0.00015	-0.00016
T Stats	0.63731	0.28353	0.05195	0.05661	0.44189	0.44740	0.47055	0.45817	0.32460	0.63758	0.51181	0.24629	0.22959	0.07418	0.03247	0.22780	0.09025	0.03701	0.77118	0.61518	0.36161	0.47351	0.53437	0.38416	0.65743	0.77043	0.62340	0.34510	0.30597
Signed Ranked	0.00030	0.00003	0.00003	0.00005	0.00216	0.00386	0.01529	0.03857	0.09300	0.00039	0.00015	0.00017	0.00048	0.00036	0.00019	0.00621	0.00286	0.00054	0.00076	0.00068	0.00059	0.00328	0.00904	0.00883	0.03429	0.05844	0.04702	0.00013	0.00046

3_25	4_25	5_25	6_25	7_25	8_25	9_25	1_30	2_30	3_30	4_30	5_30	6_30	7_30	8_30	9_30	1_50	2_50	3_50	4_50	5_50	6_50	7_50	8_50	9_50	1_100	2_100	3_100	4_100	5_100	6_100	7_100	8_100	9_100
-0.00006	0.00003	-0.00003	0.00017	-0.00002	-0.00037	-0.00035	-0.00007	-0.00007	-0.00020	-0.00018	0.00008	-0.00006	-0.00015	-0.00036	-0.00021	-0.00027	-0.00037	-0.00052	-0.00043	-0.00039	-0.00045	-0.00027	-0.00016	-0.00009	-0.00031	-0.00015	-0.00011	0.00006	0.00018	0.00017	0.00006	0.00009	0.00001
0.85335	0.92365	0.92138	0.59117	0.94592	0.24589	0.27574	0.81598	0.81904	0.53809	0.56922	0.81465	0.85532	0.63292	0.26659	0.50244	0.39708	0.24538	0.10167	0.18390	0.22328	0.15841	0.39465	0.62422	0.76834	0.34132	0.64150	0.74225	0.85412	0.58094	0.60157	0.85846	0.78554	0.96630
0.25747	0.26698	0.28374	0.58523	0.25046	0.04688	0.07634	0.07882	0.18516	0.11469	0.11526	0.43749	0.31223	0.10475	0.07230	0.23448	0.04257	0.07619	0.01424	0.02342	0.04485	0.05373	0.09752	0.15571	0.29099	0.18025	0.28091	0.32724	0.54697	0.70615	0.78033	0.61130	0.92888	0.92803
-0.00007	-0.00006	-0.00009	-0.00010	-0.00015	-0.00011	-0.00028	-0.00009	-0.00027	-0.00026	-0.00032	-0.00033	-0.00029	-0.00037	-0.00054	-0.00053	-0.00046	-0.00040	-0.00046	-0.00061	-0.00047	-0.00008	-0.00008	-0.00029	-0.00021	-0.00021	-0.00012	-0.00016	-0.00006	-0.00009	-0.00020	-0.00020	-0.00014	
0.79438	0.81393	0.73199	0.70370	0.57207	0.68783	0.56157	0.29403	0.54349	0.98929	0.73265	0.30767	0.32270	0.23372	0.20928	0.10536	0.28102	0.16617	0.04126	0.04495	0.08659	0.13597	0.08083	0.02266	0.07503	0.76178	0.27314	0.43605	0.42156	0.64035	0.80070	0.72995	0.45358	0.69314
0.22530	0.34428	0.40986	0.38134	0.27653	0.35339	0.41152	0.00965	0.06855	0.32589	0.30544	0.14448	0.14457	0.11337	0.14773	0.07120	0.02829	0.02746	0.01483	0.02390	0.05631	0.08691	0.06232	0.02350	0.06701	0.22265	0.12960	0.22301	0.20173	0.43137	0.56246	0.58624	0.35636	0.63653
-0.00013	-0.00002	-0.00004	0.00000	0.00016	0.00004	-0.00003	-0.00009	-0.00021	-0.00026	-0.00023	-0.00009	-0.00002	0.00001	-0.00003	-0.00011	-0.00008	0.00006	0.00009	0.00010	-0.00003	0.00000	0.00003	0.00008	-0.00001	0.00017	0.00015	0.00021	0.00015	0.00014	0.00009	0.00013	0.00017	0.00028
0.61837	0.95024	0.85994	0.98918	0.52899	0.89007	0.89029	0.72197	0.41104	0.30794	0.35610	0.71312	0.92513	0.97027	0.89931	0.65279	0.76052	0.10213	0.73401	0.70819	0.91307	0.90959	0.91092	0.73883	0.97148	0.51335	0.56126	0.41903	0.56375	0.58398	0.70846	0.61732	0.50038	0.43970
0.05559	0.11993	0.07044	0.10578	0.41610	0.21986	0.18624	0.04078	0.01552	0.02193	0.03180	0.10698	0.18007	0.23085	0.17106	0.09250	0.09294	0.80145	0.23692	0.40820	0.27345	0.26670	0.22784	0.40352	0.31742	0.40340	0.32152	0.43243	0.35800	0.39036	0.29825	0.41390	0.51724	0.68254
-0.00011	-0.00004	-0.00008	0.00000	-0.00002	-0.00016	-0.00019	-0.00018	-0.00018	-0.00018	-0.00020	-0.00013	-0.00014	-0.00017	-0.00026	-0.00027	-0.00022	-0.00028	-0.00033	-0.00029	-0.00030	-0.00029	-0.00024	-0.00024	-0.00021	-0.00007	-0.00010	-0.00004	-0.00001	0.00006	0.00006	0.00003	0.00001	0.00002
0.51192	0.82078	0.61448	0.98496	0.89665	0.32332	0.22912	0.26345	0.26492	0.26802	0.22290	0.42480	0.37923	0.28072	0.10865	0.90804	0.17093	0.08318	0.04035	0.06986	0.06531	0.07512	0.13039	0.13373	0.19210	0.66786	0.52822	0.80415	0.96926	0.70794	0.69279	0.87287	0.93150	0.88426
0.00895	0.02600	0.01899	0.05481	0.05548	0.01161	0.01429	0.00008	0.00057	0.06160	0.01656	0.01454	0.01581	0.00650	0.00431	0.00404	0.00037	0.00068	0.00029	0.01226	0.02633	0.04007	0.03397	0.01387	0.04458	0.03208	0.07396	0.09070	0.21336	0.24759	0.24263	0.29371	0.50564	

15 mins With Transaction cost																														
Year	Strategy	1_10	2_10	3_10	4_10	5_10	6_10	7_10	8_10	9_10	1_15	2_15	3_15	4_15	5_15	6_15	7_15	8_15	9_15	1_20	2_20	3_20	4_20	5_20	6_20	7_20	8_20	9_20	1_25	2_25
2008																														
	Profit(%)	-0.00929	-0.00703	-0.00673	-0.00628	-0.00568	-0.00588	-0.00643	-0.00745	-0.00979	-0.00732	-0.00553	-0.00494	-0.00446	-0.00437	-0.00441	-0.00398	-0.00414	-0.00423	-0.00634	-0.00453	-0.00413	-0.00376	-0.00337	-0.00323	-0.00290	-0.00291	-0.00298	-0.00584	-0.00415
	T Stats	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Signed Ranked	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2009																														
	Profit(%)	-0.00899	-0.00734	-0.00639	-0.00610	-0.00593	-0.00608	-0.00642	-0.00741	-0.00979	-0.00729	-0.00567	-0.00460	-0.00431	-0.00410	-0.00414	-0.00407	-0.00420	-0.00436	-0.00630	-0.00476	-0.00390	-0.00347	-0.00325	-0.00318	-0.00317	-0.00313	-0.00297	-0.00563	-0.00431
	T Stats	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Signed Ranked	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2010																														
	Profit(%)	-0.00911	-0.00710	-0.00637	-0.00619	-0.00595	-0.00601	-0.00646	-0.00717	-0.00952	-0.00739	-0.00551	-0.00494	-0.00448	-0.00437	-0.00415	-0.00400	-0.00407	-0.00419	-0.00623	-0.00481	-0.00412	-0.00355	-0.00341	-0.00328	-0.00308	-0.00288	-0.00291	-0.00572	-0.00430
	T Stats	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Signed Ranked	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ALL																														
	Profit(%)	-0.00915	-0.00718	-0.00651	-0.00621	-0.00587	-0.00601	-0.00644	-0.00734	-0.00970	-0.00735	-0.00560	-0.00485	-0.00443	-0.00430	-0.00424	-0.00404	-0.00415	-0.00428	-0.00632	-0.00473	-0.00407	-0.00361	-0.00336	-0.00324	-0.00306	-0.00298	-0.00298	-0.00576	-0.00429
	T Stats	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Signed Ranked	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3_25	4_25	5_25	6_25	7_25	8_25	9_25	1_30	2_30	3_30	4_30	5_30	6_30	7_30	8_30	9_30	1_50	2_50	3_50	4_50	5_50	6_50	7_50	8_50	9_50	1_100	2_100	3_100	4_100	5_100	6_100	7_100	8_100	9_100
-0.00350	-0.00305	-0.00282	-0.00246	-0.00251	-0.00281	-0.00276	-0.00531	-0.00378	-0.00327	-0.00292	-0.00242	-0.00238	-0.00240	-0.00248	-0.00222	-0.00440	-0.00327	-0.00290	-0.00257	-0.00234	-0.00224	-0.00194	-0.00168	-0.00154	-0.00311	-0.00213	-0.00174	-0.00134	-0.00106	-0.00096	-0.00103	-0.00091	-0.00097
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
-0.00340	-0.00306	-0.00286	-0.00272	-0.00264	-0.00255	-0.00247	-0.00531	-0.00388	-0.00309	-0.00277	-0.00276	-0.00258	-0.00253	-0.00245	-0.00247	-0.00410	-0.00316	-0.00284	-0.00256	-0.00231	-0.00208	-0.00207	-0.00214	-0.00191	-0.00244	-0.00212	-0.00172	-0.00153	-0.00129	-0.00113	-0.00108	-0.00114	-0.00102
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
-0.00362	-0.00305	-0.00285	-0.00264	-0.00233	-0.00238	-0.00240	-0.00510	-0.00391	-0.00340	-0.00300	-0.00258	-0.00238	-0.00219	-0.00214	-0.00214	-0.00378	-0.00274	-0.00217	-0.00184	-0.00178	-0.00160	-0.00143	-0.00131	-0.00134	-0.00232	-0.00163	-0.00125	-0.00115	-0.00102	-0.00098	-0.00084	-0.00073	-0.00067
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
-0.00352	-0.00308	-0.00287	-0.00263	-0.00251	-0.00259	-0.00255	-0.00528	-0.00389	-0.00328	-0.00293	-0.00263	-0.00248	-0.00240	-0.00238	-0.00230	-0.00410	-0.00307	-0.00264	-0.00232	-0.00215	-0.00198	-0.00182	-0.00173	-0.00161	-0.00261	-0.00195	-0.00157	-0.00134	-0.00112	-0.00102	-0.00099	-0.00093	-0.00089
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

30 mins Without Transaction cost																														
Strategy																														
Year		1_10	2_10	3_10	4_10	5_10	6_10	7_10	8_10	9_10	1_15	2_15	3_15	4_15	5_15	6_15	7_15	8_15	9_15	1_20	2_20	3_20	4_20	5_20	6_20	7_20	8_20	9_20	1_25	2_25
2008																														
Profit(%)		-0.00026	-0.00037	-0.00034	0.00021	0.00013	-0.00061	-0.00046	-0.00028	-0.00062	-0.00057	-0.00040	-0.00078	-0.00065	-0.00053	-0.00069	-0.00061	-0.00104	-0.00100	-0.00087	-0.00099	-0.00081	-0.00045	-0.00038	0.00003	-0.00028	0.00000	-0.00032	-0.00088	-0.00102
T Stats		0.67979	0.56526	0.59774	0.74043	0.83500	0.34490	0.47422	0.66454	0.33468	0.37325	0.53546	0.22246	0.31351	0.41280	0.28229	0.34563	0.10425	0.11788	0.17672	0.12484	0.21018	0.48288	0.55308	0.96810	0.66447	0.99585	0.61739	0.17317	0.11258
Signed Ranked		0.12647	0.06683	0.06821	0.47161	0.31660	0.06243	0.10169	0.40726	0.17818	0.03681	0.07532	0.05916	0.17413	0.24987	0.33740	0.36168	0.18192	0.17062	0.00795	0.03014	0.02430	0.23833	0.27317	0.73986	0.45330	0.67629	0.59721	0.02021	0.01408
2009																														
Profit(%)		-0.00016	-0.00028	-0.00035	-0.00043	-0.00077	-0.00049	-0.00106	-0.00120	-0.00106	-0.00040	-0.00013	-0.00062	-0.00063	-0.00064	-0.00051	-0.00069	-0.00064	-0.00067	-0.00077	-0.00093	-0.00074	-0.00076	-0.00079	-0.00059	-0.00067	-0.00063	-0.00069	-0.00090	-0.00094
T Stats		0.76197	0.59798	0.50746	0.41127	0.14455	0.35041	0.04333	0.02228	0.04361	0.44030	0.80334	0.23416	0.23004	0.21975	0.32898	0.18688	0.22077	0.20075	0.14204	0.07638	0.15625	0.14511	0.13288	0.26438	0.19963	0.12287	0.19138	0.08585	0.07409
Signed Ranked		0.11115	0.11575	0.14988	0.13617	0.04578	0.08964	0.00466	0.00604	0.01412	0.04595	0.34775	0.08072	0.06603	0.07170	0.07364	0.04305	0.07815	0.07433	0.02070	0.01984	0.03413	0.02912	0.03624	0.08410	0.06371	0.10577	0.20923	0.01004	0.02719
2010																														
Profit(%)		-0.00047	-0.00075	-0.00066	-0.00056	-0.00038	-0.00001	-0.00066	-0.00055	-0.00063	-0.00039	-0.00074	-0.00033	-0.00030	-0.00025	-0.00009	-0.00027	-0.00039	0.00019	-0.00062	-0.00060	-0.00015	-0.00016	-0.00015	-0.00001	-0.00008	0.00010	0.00008	-0.00039	-0.00026
T Stats		0.34550	0.13641	0.26506	0.26477	0.45002	0.53887	0.18861	0.27428	0.19863	0.43988	0.14094	0.51342	0.55062	0.61970	0.85634	0.59182	0.44080	0.70879	0.21888	0.23156	0.75832	0.75090	0.77273	0.99104	0.88087	0.84096	0.88739	0.44042	0.60456
Signed Ranked		0.01167	0.00687	0.00934	0.01324	0.03579	0.08870	0.04033	0.01287	0.01500	0.02119	0.00460	0.08771	0.07549	0.18309	0.29299	0.19465	0.08782	0.30636	0.00665	0.00954	0.12256	0.13774	0.21832	0.29936	0.35185	0.57701	0.45745	0.05377	0.05664
ALL																														
Profit(%)		-0.00034	-0.00049	-0.00045	-0.00030	-0.00038	-0.00049	-0.00079	-0.00074	-0.00085	-0.00050	-0.00045	-0.00062	-0.00057	-0.00052	-0.00048	-0.00059	-0.00076	-0.00054	-0.00077	-0.00085	-0.00060	-0.00049	-0.00049	-0.00023	-0.00037	-0.00020	-0.00033	-0.00073	-0.00075
T Stats		0.28193	0.12286	0.16038	0.34800	0.23460	0.12613	0.01403	0.02104	0.00830	0.12047	0.15651	0.05376	0.07676	0.10535	0.13694	0.06756	0.01833	0.08994	0.01593	0.00771	0.06021	0.12386	0.12867	0.48054	0.24265	0.53942	0.31016	0.02305	0.01980
Signed Ranked		0.00064	0.00027	0.00045	0.00460	0.00199	0.00160	0.00007	0.00023	0.00012	0.00012	0.00080	0.00118	0.00230	0.00775	0.01673	0.00728	0.00231	0.00834	0.00001	0.00003	0.00033	0.00307	0.00632	0.05499	0.02930	0.11665	0.11862	0.00006	0.00006

[illegible]

3 25	4 25	5 25	6 25	7 25	8 25	9 25	1 30	2 30	3 30	4 30	5 30	6 30	7 30	8 30	9 30	1 50	2 50	3 50	4 50	5 50	6 50	7 50	8 50	9 50	1 100	2 100	3 100	4 100	5 100	6 100	7 100	8 100	9 100		
-0.00397	-0.00346	-0.00309	-0.00286	-0.00257	-0.00278	-0.00259	-0.00629	-0.00456	-0.00372	-0.00338	-0.00326	-0.00268	-0.00292	-0.00265	-0.00267	-0.00462	-0.00297	-0.00234	-0.00180	-0.00157	-0.00173	-0.00160	-0.00167	-0.00156	-0.00322	-0.00237	-0.00171	-0.00140	-0.00133	-0.00116	-0.00100	-0.00080	-0.00053		
0.00000	0.00000	0.00000	0.00002	0.00009	0.00002	0.00008	0.00000	0.00000	0.00000	0.00000	0.00000	0.00005	0.00001	0.00005	0.00005	0.00000	0.00001	0.00041	0.00630	0.01670	0.00801	0.01415	0.01035	0.01658	0.00000	0.00035	0.00928	0.03274	0.04184	0.07500	0.12372	0.22146	0.41357		
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00057	0.00189	0.00110	0.00128	0.00087	0.00169	0.00001	0.00081	0.01051	0.03951	0.03195	0.04555	0.07342	0.11489	0.28015		
-0.00416	-0.00384	-0.00342	-0.00375	-0.00354	-0.00343	-0.00328	-0.00553	-0.00418	-0.00403	-0.00393	-0.00400	-0.00369	-0.00354	-0.00323	-0.00317	-0.00394	-0.00313	-0.00244	-0.00213	-0.00218	-0.00204	-0.00187	-0.00184	-0.00163	-0.00260	-0.00179	-0.00165	-0.00148	-0.00149	-0.00139	-0.00144	-0.00151	-0.00128		
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00008	0.00010	0.00014	0.00049	0.00058	0.00422	0.00000	0.00098	0.00220	0.01007	0.05258	0.00917	0.00688	0.00467	0.00180		
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00005	0.00006	0.00007	0.00024	0.00030	0.00155	0.00125	0.00703	0.00833	0.03266	0.01887	0.02491	0.01453	0.00598	0.02806		
-0.00335	-0.00291	-0.00258	-0.00251	-0.00233	-0.00208	-0.00219	-0.00455	-0.00333	-0.00296	-0.00278	-0.00250	-0.00185	-0.00174	-0.00192	-0.00166	-0.00341	-0.00277	-0.00181	-0.00138	-0.00133	-0.00116	-0.00080	-0.00080	-0.00083	-0.00223	-0.00101	-0.00085	-0.00063	-0.00045	-0.00037	-0.00042	-0.00036	-0.00043		
0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00006	0.00002	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002	0.00052	0.00758	0.00994	0.02398	0.11651	0.11667	0.10622	0.00003	0.03581	0.08118	0.09942	0.22079	0.37579	0.69427	0.41049	0.47517	0.39962
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000	0.00001	0.00004	0.00004	0.00016	0.00143	0.00203	0.00254	0.00072	0.03087	0.06019	0.22675	0.21710	0.23442	0.15916	0.16643	0.15740		
-0.00384	-0.00343	-0.00306	-0.00307	-0.00284	-0.00277	-0.00270	-0.00545	-0.00403	-0.00357	-0.00337	-0.00328	-0.00277	-0.00273	-0.00259	-0.00251	-0.00398	-0.00279	-0.00220	-0.00177	-0.00167	-0.00165	-0.00143	-0.00145	-0.00131	-0.00269	-0.00171	-0.00140	-0.00113	-0.00108	-0.00096	-0.00094	-0.00088	-0.00074		
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00001	0.00006	0.00000	0.00000	0.00002	0.00055	0.00092	0.00322	0.00376	0.00678	0.02286		
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00003	0.01013	0.00079	0.01553	0.00101	0.00087	0.00284		

TABLE 5																																
60 mins Without Transaction cost																																
Strategy																																
Year	1 10	2 10	3 10	4 10	5 10	6 10	7 10	8 10	9 10	1 15	2 15	3 15	4 15	5 15	6 15	7 15	8 15	9 15	1 20	2 20	3 20	4 20	5 20	6 20	7 20	8 20	9 20	1 25	2 25			
2008																																
Profit(%)	-0.00202	0.00040	-0.00003	0.00011	-0.00016	0.00013	0.00050	0.00020	0.00063	-0.00257	-0.00063	0.00007	-0.00043	-0.00088	-0.00068	0.00001	-0.00093	-0.00096	-0.00111	0.00045	0.00004	-0.00033	-0.00072	-0.00097	-0.00019	0.00057	0.00099	-0.00046	0.00051			
T Stats	0.10562	0.75116	0.97996	0.93200	0.90007	0.91384	0.68893	0.87100	0.61553	0.03929	0.61614	0.95578	0.73173	0.48267	0.58347	0.99194	0.45408	0.44314	0.37513	0.72006	0.97613	0.78906	0.56634	0.43618	0.88106	0.64997	0.42686	0.71404	0.68566			
Signed Ranked	0.01676	0.69781	0.67664	0.80000	0.71452	0.65186	0.53722	0.92797	0.81805	0.01913	0.24150	0.53983	0.42868	0.22109	0.45702	0.86367	0.27455	0.28118	0.28353	0.99867	0.64204	0.48437	0.36120	0.51561	0.95363	0.59219	0.44957	0.53587	0.90875			
2009																																
Profit(%)	-0.00229	-0.00155	-0.00147	-0.00143	-0.00095	-0.00030	-0.00063	-0.00064	-0.00067	-0.00209	-0.00203	-0.00229	-0.00202	-0.00185	-0.00134	-0.00104	-0.00126	-0.00171	-0.00186	-0.00143	-0.00033	-0.00076	-0.00123	-0.00142	-0.00127	-0.00154	-0.00173	-0.00103	-0.00011			
T Stats	0.02807	0.13788	0.15983	0.17035	0.36460	0.77419	0.54453	0.53748	0.51917	0.04552	0.05170	0.02817	0.05321	0.07564	0.19886	0.31718	0.22639	0.10081	0.07534	0.16992	0.75519	0.46758	0.23970	0.17270	0.22448	0.13971	0.09774	0.32481	0.91599			
Signed Ranked	0.01272	0.04402	0.07641	0.13224	0.32247	0.62621	0.34564	0.32076	0.49579	0.06161	0.05743	0.02381	0.06879	0.12309	0.26113	0.50433	0.30199	0.19508	0.14569	0.27628	0.90947	0.64647	0.46916	0.34734	0.38437	0.18556	0.14535	0.32051	0.92055			
2010																																
Profit(%)	-0.00091	-0.00066	-0.00007	0.00015	0.00099	0.00019	-0.00011	-0.00089	-0.00022	0.00043	-0.00050	0.00085	0.00037	0.00034	-0.00041	-0.00063	-0.00083	-0.00082	0.00078	-0.00029	0.00015	0.00058	0.00032	0.00019	0.00027	-0.00027	0.00011	0.00051	0.00046			
T Stats	0.36194	0.50862	0.94620	0.88368	0.31988	0.84954	0.91080	0.37379	0.82513	0.66968	0.61785	0.39659	0.70797	0.73088	0.68481	0.52613	0.40682	0.41349	0.43228	0.76816	0.87873	0.56048	0.75087	0.84733	0.78410	0.78873	0.91273	0.61167	0.64344			
Signed Ranked	0.06200	0.16015	0.60175	0.51928	0.91537	0.66703	0.41737	0.19727	0.72321	0.92149	0.31544	0.95729	0.71194	0.53327	0.23209	0.14565	0.20415	0.15853	0.72903	0.13746	0.32004	0.67899	0.45199	0.40867	0.34378	0.18777	0.38489	0.39423	0.42920			
ALL																																
Profit(%)	-0.00176	-0.00069	-0.00060	-0.00045	-0.00008	-0.00005	-0.00014	-0.00048	-0.00012	-0.00143	-0.00108	-0.00049	-0.00072	-0.00079	-0.00078	-0.00057	-0.00100	-0.00114	-0.00076	-0.00047	-0.00009	-0.00022	-0.00054	-0.00073	-0.00038	-0.00042	-0.00023	-0.00034	0.00025			
T Stats	0.00533	0.27345	0.34319	0.47633	0.89962	0.93742	0.82114	0.44220	0.85386	0.02325	0.08790	0.43540	0.25134	0.20943	0.21544	0.36746	0.11246	0.07050	0.22720	0.45733	0.88696	0.73142	0.38771	0.25042	0.54451	0.50284	0.71577	0.58702	0.69540			
Signed Ranked	0.00008	0.02077	0.09489	0.14583	0.42706	0.37460	0.46666	0.16163	0.64926	0.01033	0.01703	0.08526	0.07801	0.05141	0.09033	0.18625	0.04986	0.03081	0.08096	0.12881	0.34052	0.32493	0.17106	0.16506	0.28546	0.22424	0.35608	0.15365	0.63592			

3 25	4 25	5 25	6 25	7 25	8 25	9 25	1 30	2 30	3 30	4 30	5 30	6 30	7 30	8 30	9 30	1 50	2 50	3 50	4 50	5 50	6 50	7 50	8 50	9 50	1 100	2 100	3 100	4 100	5 100	6 100	7 100	8 100	9 100
0.00069 -0.00027 -0.00012 -0.00005 0.00100 0.00148 0.00180 -0.00091 -0.00005 0.00060 0.00009 0.00001 -0.00031 0.00040 0.00149 0.00120 -0.00065 0.00020 0.00053 0.00082 0.00124 0.00141 0.00157 0.00153 0.00170 0.00063 0.00049 0.00101 0.00108 0.00121 0.00107 0.00079 0.00068 0.00089																																	
0.57778 0.82784 0.92646 0.96907 0.42484 0.23489 0.14885 0.46644 0.97070 0.63027 0.94045 0.99636 0.80115 0.75008 0.23206 0.33702 0.60313 0.87596 0.67425 0.51194 0.32310 0.26209 0.21199 0.22233 0.17413 0.62255 0.69635 0.42186 0.39344 0.33847 0.39782 0.53124 0.58882 0.47933																																	
0.70832 0.81769 0.75297 0.75501 0.46192 0.18972 0.09600 0.33848 0.51997 0.95079 0.81058 0.78167 0.69757 0.94775 0.30865 0.47849 0.64073 0.96891 0.72396 0.67251 0.33925 0.26943 0.20834 0.21963 0.15213 0.39086 0.49659 0.35675 0.30404 0.23522 0.31402 0.38668 0.42744 0.37365																																	
-0.00400 -0.00123 -0.00075 -0.00056 -0.00016 -0.00053 -0.00074 -0.00072 -0.00045 -0.00052 -0.00030 -0.00032 -0.00024 -0.00067 -0.00110 -0.00086 -0.00033 0.00037 -0.00107 -0.00096 -0.00091 -0.00111 -0.00125 -0.00105 -0.00098 0.00030 0.00022 0.00005 -0.00016 -0.00035 -0.00028 -0.00018 -0.00023 -0.00025																																	
0.70336 0.23986 0.47407 0.59405 0.88014 0.60837 0.44705 0.49054 0.63671 0.61782 0.77520 0.75980 0.82048 0.52124 0.29063 0.40723 0.75491 0.45990 0.30358 0.35685 0.38239 0.28605 0.23264 0.31388 0.34552 0.77085 0.83445 0.95799 0.87616 0.79377 0.78756 0.86368 0.82869 0.81201																																	
0.88733 0.26523 0.50287 0.72505 0.98880 0.67859 0.46680 0.49309 0.48500 0.47680 0.61330 0.68215 0.81205 0.54770 0.30821 0.35846 0.76485 0.54143 0.32784 0.47009 0.52686 0.40427 0.40214 0.38499 0.40323 0.67895 0.73614 0.90408 0.88000 0.74577 0.80161 0.82505 0.77319 0.73614																																	
0.00092 0.00115 0.00101 -0.00002 0.00001 0.00021 0.00007 0.00007 0.00001 0.00001 0.00101 0.00117 0.00079 0.00027 0.00032 -0.00065 0.00047 0.00144 0.00132 0.00115 0.00139 0.00164 0.00144 0.00136 0.00119 0.00115 0.00110 0.00089 0.00079 0.00024 0.00021 -0.00023																																	
0.35788 0.25075 0.31023 0.98771 0.91139 0.83219 0.94428 0.44324 0.04084 0.31277 0.02419 0.43154 0.78356 0.74525 0.95567 0.94300 0.62045 0.25418 0.18761 0.24858 0.16510 0.10072 0.27026 0.25154 0.17214 0.23369 0.25002 0.26886 0.32816 0.42868 0.69801 0.81098 0.90895 0.82129																																	
0.94252 0.81102 0.99256 0.40782 0.43420 0.53879 0.58443 0.50533 0.73897 0.87050 0.73240 0.90379 0.53083 0.64970 0.45977 0.44594 0.59381 0.85131 0.79447 0.82599 0.64196 0.59012 0.94258 0.77798 0.73687 0.90293 0.99360 0.97998 0.94905 0.94917 0.63245 0.67539 0.56795 0.33807																																	
0.00035 -0.00013 0.00004 -0.00022 0.00030 0.00037 0.00036 -0.00030 0.00006 0.00034 0.00031 0.00017 -0.00007 0.00003 0.00011 0.00012 -0.00015 0.00019 0.00026 0.00034 0.00058 0.00064 0.00047 0.00054 0.00069 0.00069 0.00062 0.00071 0.00060 0.00052 0.00037 0.00027 0.00018 0.00012																																	
0.57434 0.83742 0.94989 0.73258 0.63148 0.56190 0.57227 0.63431 0.91828 0.59343 0.61798 0.78855 0.91362 0.59861 0.85927 0.85037 0.81646 0.75889 0.67511 0.59437 0.35978 0.31286 0.45316 0.38854 0.27677 0.27813 0.32849 0.25892 0.34033 0.41029 0.55433 0.67020 0.77924 0.84546																																	
0.98321 0.50789 0.55130 0.37413 0.96167 0.87981 0.91909 0.17730 0.32114 0.70185 0.80588 0.66656 0.50680 0.60666 0.70963 0.58467 0.47923 0.80980 0.86438 0.98476 0.61648 0.62447 0.74288 0.67965 0.57406 0.44272 0.33840 0.51903 0.63707 0.64583 0.85276 0.78089 0.98815 0.83630																																	

3_25	4_25	5_25	6_25	7_25	8_25	9_25	1_30	2_30	3_30	4_30	5_30	6_30	7_30	8_30	9_30	1_50	2_50	3_50	4_50	5_50	6_50	7_50	8_50	9_50	1_100	2_100	3_100	4_100	5_100	6_100	7_100	8_100	9_100
-0.00281	-0.00343	-0.00302	-0.00284	-0.00160	-0.00099	-0.00056	-0.00638	-0.00389	-0.00260	-0.00273	-0.00270	-0.00282	-0.00196	-0.00076	-0.00103	-0.00457	-0.00263	-0.00180	-0.00122	-0.00072	-0.00028	0.00002	0.00003	0.00029	-0.00174	-0.00121	-0.00034	-0.00014	0.00018	0.00010	-0.00016	-0.00023	0.00003
0.02825	0.00733	0.01766	0.02536	0.20646	0.43046	0.65778	0.00000	0.00261	0.04244	0.03249	0.03413	0.02667	0.12234	0.54573	0.41439	0.00053	0.04159	0.16030	0.33875	0.57118	0.82226	0.98469	0.98039	0.81953	0.18465	0.34685	0.79192	0.91250	0.89009	0.93619	0.90080	0.85451	0.98232
0.00676	0.00195	0.00335	0.00564	0.08347	0.25101	0.48733	0.00003	0.00037	0.00677	0.00628	0.00641	0.00722	0.02827	0.23827	0.14155	0.01121	0.03569	0.11597	0.16365	0.35963	0.58722	0.86732	0.84332	0.97660	0.70503	0.63987	0.96225	0.99026	0.79640	0.86611	0.95514	0.95572	0.87123
-0.00366	-0.00414	-0.00348	-0.00320	-0.00262	-0.00292	-0.00302	-0.00569	-0.00404	-0.00362	-0.00305	-0.00283	-0.00254	-0.00290	-0.00320	-0.00290	-0.00387	-0.00338	-0.00336	-0.00298	-0.00269	-0.00277	-0.00282	-0.00254	-0.00238	-0.00199	-0.00145	-0.00136	-0.00150	-0.00158	-0.00147	-0.00124	-0.00118	-0.00118
0.00072	0.00012	0.00111	0.00267	0.01332	0.00596	0.00444	0.00000	0.00021	0.00078	0.00438	0.00781	0.01664	0.00642	0.00256	0.00618	0.00046	0.00178	0.00169	0.00513	0.01115	0.00894	0.00758	0.01631	0.02418	0.06566	0.17433	0.20027	0.15641	0.13319	0.16310	0.23760	0.26242	0.25957
0.00212	0.00015	0.00101	0.00232	0.00694	0.00369	0.00211	0.00017	0.00035	0.00044	0.00165	0.00323	0.00848	0.00344	0.00214	0.00234	0.01326	0.00959	0.00475	0.01134	0.02413	0.01707	0.01645	0.02137	0.02199	0.30032	0.29848	0.24347	0.14264	0.11992	0.15180	0.17383	0.19723	0.17742
-0.00223	-0.00160	-0.00159	-0.00251	-0.00232	-0.00212	-0.00223	-0.00379	-0.00249	-0.00177	-0.00136	-0.00150	-0.00185	-0.00174	-0.00206	-0.00193	-0.00278	-0.00115	-0.00059	-0.00060	-0.00027	0.00018	-0.00034	-0.00021	0.00009	-0.00081	-0.00028	-0.00006	-0.00018	-0.00021	-0.00058	-0.00070	-0.00074	-0.00108
0.03051	0.11757	0.11961	0.01432	0.02268	0.03685	0.02783	0.00040	0.01653	0.08461	0.18305	0.14108	0.06869	0.08667	0.04282	0.05709	0.00834	0.26379	0.56258	0.55792	0.79255	0.86076	0.73308	0.83857	0.92694	0.43072	0.78240	0.95611	0.85615	0.83453	0.56436	0.48808	0.46002	0.28200
0.00224	0.01114	0.01208	0.00173	0.00124	0.00205	0.00258	0.00032	0.00190	0.01347	0.02964	0.01521	0.00653	0.01164	0.00559	0.00543	0.01433	0.09885	0.14290	0.13133	0.20782	0.33795	0.15798	0.25314	0.33210	0.23005	0.25082	0.30662	0.27236	0.31725	0.15327	0.16967	0.14235	0.07009
-0.00294	-0.00306	-0.00270	-0.00285	-0.00219	-0.00203	-0.00195	-0.00529	-0.00349	-0.00268	-0.00237	-0.00233	-0.00238	-0.00218	-0.00200	-0.00197	-0.00371	-0.00237	-0.00190	-0.00160	-0.00121	-0.00096	-0.00104	-0.00090	-0.00067	-0.00152	-0.00097	-0.00059	-0.00063	-0.00057	-0.00066	-0.00071	-0.00073	-0.00076
0.00001	0.00000	0.00003	0.00001	0.00064	0.00155	0.00230	0.00000	0.00000	0.00004	0.00023	0.00030	0.00021	0.00069	0.00177	0.00214	0.00000	0.00027	0.00328	0.01293	0.05842	0.13390	0.10299	0.16060	0.29619	0.02065	0.13278	0.36155	0.32706	0.37620	0.29855	0.26579	0.25398	0.23310
0.00000	0.00000	0.00000	0.00000	0.00001	0.00003	0.00008	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00006	0.00003	0.00002	0.00026	0.00081	0.00182	0.01179	0.02612	0.02405	0.03910	0.06583	0.13376	0.13271	0.20905	0.14273	0.18518	0.12655	0.12697	0.10925	0.08824

TABLE 6																													
day Without Transaction cost																													
Strategy																													
Year	1_10	2_10	3_10	4_10	5_10	6_10	7_10	8_10	9_10	1_15	2_15	3_15	4_15	5_15	6_15	7_15	8_15	9_15	1_20	2_20	3_20	4_20	5_20	6_20	7_20	8_20	9_20	1_25	2_25
2000																													
Profit(%)	0.00496	0.00643	-0.00451	-0.01137	-0.00189	-0.01390	-0.01605	-0.00199	0.00012	-0.01536	-0.01496	-0.01577	-0.01371	-0.01589	-0.01316	-0.01664	-0.01310	-0.01821	-0.01242	-0.00951	-0.00882	-0.01579	-0.02186	-0.01739	-0.02306	-0.02250	-0.01750	-0.00919	-0.00387
T Stats	0.72115	0.64502	0.74639	0.41485	0.89257	0.32068	0.25293	0.88726	0.99338	0.27357	0.28747	0.26400	0.33166	0.25860	0.34959	0.23853	0.35368	0.19702	0.37700	0.49992	0.53141	0.26236	0.12099	0.21952	0.10312	0.11168	0.21708	0.51472	0.78362
Signed Ranked	0.47142	0.46855	0.92191	0.56752	0.83161	0.62413	0.56414	0.71817	0.77623	0.55519	0.55192	0.49236	0.60430	0.45930	0.64267	0.42535	0.52554	0.38638	0.74817	0.87110	0.87018	0.48609	0.36247	0.59687	0.37882	0.36702	0.56400	0.80387	0.87568
2001																													
Profit(%)	0.01507	0.03364	0.02669	0.03064	0.02568	0.02257	0.02391	0.02319	0.02855	0.02419	0.02325	0.01607	0.01862	0.01754	0.01989	0.02749	0.03225	0.02159	0.01755	0.02802	0.02200	0.02127	0.02500	0.03521	0.02495	0.02862	0.01853	0.02889	0.02979
T Stats	0.38933	0.05405	0.12681	0.07945	0.14201	0.19705	0.17158	0.18503	0.10241	0.16662	0.18393	0.35882	0.28748	0.31628	0.25570	0.11580	0.06480	0.21735	0.31624	0.10895	0.20858	0.22421	0.15292	0.04367	0.15375	0.10153	0.28989	0.09834	0.08821
Signed Ranked	0.45504	0.15576	0.11279	0.06698	0.12502	0.21732	0.23008	0.23075	0.14265	0.13597	0.20263	0.51170	0.31233	0.35165	0.34284	0.16342	0.04642	0.24614	0.36921	0.17352	0.24128	0.22192	0.19660	0.05367	0.16656	0.09597	0.31770	0.12953	0.12737
2002																													
Profit(%)	0.02012	0.03240	0.02148	0.00665	0.02425	0.01698	0.01184	0.02312	0.01567	0.01587	0.02196	0.01100	0.01446	0.01291	0.00259	-0.00049	-0.00221	-0.00760	0.02212	0.01974	0.01321	0.01010	0.01040	-0.00202	-0.00963	-0.00301	-0.00738	0.00348	0.01035
T Stats	0.22444	0.04997	0.19468	0.68824	0.14298	0.30550	0.47514	0.12316	0.34431	0.33816	0.18485	0.50714	0.38290	0.43625	0.87591	0.97661	0.89405	0.64682	0.18167	0.23338	0.42548	0.54260	0.53057	0.90284	0.56150	0.85611	0.65637	0.83395	0.53268
Signed Ranked	0.25138	0.06317	0.20161	0.50037	0.09171	0.18944	0.32695	0.10681	0.18447	0.32424	0.12298	0.46914	0.37303	0.48224	0.94572	0.87001	0.86601	0.90541	0.13926	0.18195	0.40046	0.55400	0.56539	0.92823	0.66710	0.95246	0.86601	0.62878	0.44001
2003																													
Profit(%)	0.02671	0.00188	-0.00001	-0.00969	-0.00506	0.00564	0.00402	-0.00743	-0.02114	0.01526	0.00819	0.00543	0.00800	0.00279	-0.00072	-0.00184	0.00656	0.00452	0.02091	0.00756	0.00116	0.01087	0.01740	0.01308	0.00175	0.00114	0.01263	0.01252	-0.00125
T Stats	0.12479	0.91419	0.99951	0.57835	0.77148	0.74630	0.81785	0.67020	0.22485	0.38129	0.63863	0.75547	0.64621	0.87309	0.96716	0.91589	0.70664	0.79567	0.22991	0.66451	0.94702	0.53281	0.31780	0.45310	0.92016	0.94774	0.46868	0.47269	0.94307
Signed Ranked	0.16223	0.76066	0.66950	0.28634	0.49249	0.96586	0.80986	0.93079	0.30324	0.51157	0.90046	0.99635	0.82406	0.94401	0.79828	0.93542	0.51050	0.55697	0.21262	0.80342	0.95659	0.65984	0.36221	0.56257	0.98508	0.97514	0.45499	0.50463	0.79251
2004																													
Profit(%)	-0.00597	0.00685	0.00604	0.00052	0.00018	0.01269	-0.00317	0.00208	-0.00146	-0.00279	-0.00416	-0.00245	0.00511	-0.00139	0.00516	0.00807	0.00827	0.00544	-0.00269	-0.00927	0.00213	0.00457	0.01164	0.00543	0.00142	0.00452	0.01055	0.00593	-0.00614
T Stats	0.73601	0.69919	0.72328	0.97649	0.99174	0.47379	0.85805	0.90648	0.94546	0.87052	0.81452	0.88984	0.72788	0.93765	0.77100	0.68809	0.64073	0.75858	0.87924	0.60069	0.94038	0.79659	0.51145	0.75905	0.93619	0.79882	0.55142	0.73798	0.72883
Signed Ranked	0.81382	0.40180	0.36345	0.56511	0.72978	0.48278	0.73849	0.95190	0.93480	0.71800	0.86744	0.86939	0.74912	0.94927	0.63818	0.51962	0.51214	0.61706	0.99341	0.91511	0.75665	0.61648	0.42544	0.69161	0.84927	0.71924	0.59741	0.55066	0.86224
2005																													
Profit(%)	0.01557	0.01807	0.01100	0.01193	0.00458	0.00494	0.00492	0.01123	0.00891	0.02682	0.01522	0.01006	0.01835	0.01647	0.01203	0.00868	0.00565	0.00637	0.00476	0.01536	0.00632	0.00041	0.00244	-0.00876	-0.00623	-0.00505	-0.00037	-0.00440	-0.01506
T Stats	0.36884	0.29675	0.52548	0.49126	0.79158	0.77550	0.77638	0.51679	0.60736	0.12100	0.37953	0.56149	0.28929	0.34174	0.48745	0.61653	0.74425	0.71327	0.78369	0.37533	0.71530	0.98102	0.88806	0.61310	0.71917	0.77087	0.98301	0.79950	0.38450
Signed Ranked	0.53994	0.42280	0.64647	0.64825	0.87720	0.86289	0.83247	0.85445	0.80677	0.15337	0.56036	0.67401	0.41210	0.58087	0.79145	0.79273	0.98780	0.99044	0.50287	0.64261	0.93119	0.68704	0.62964	0.95618	0.88339	0.90889	0.63434	0.78986	0.61794
2006																													
Profit(%)	-0.00218	0.01312	-0.01006	-0.00534	-0.00215	-0.00733	-0.00446	-0.00876	-0.00441	0.00070	0.01416	-0.00308	0.00116	0.00341	-0.00004	0.00136	0.01280	0.01949	0.00758	0.00964	0.01693	0.01723	0.01115	0.00831	0.01381	0.01450	0.01469	0.00657	0.01088
T Stats	0.88576	0.38635	0.50690	0.72466	0.88710	0.62870	0.76836	0.56342	0.77113	0.96294	0.34992	0.83876	0.93889	0.82210	0.99782	0.92866	0.39834	0.19793	0.61708	0.52460	0.26354	0.25529	0.46175	0.58360	0.36196	0.33826	0.33197	0.66488	0.27280
Signed Ranked	0.90106	0.35932	0.51474	0.19184	0.94088	0.73881	0.95549	0.74983	0.87314	0.83057	0.29419	0.87500	0.62969	0.49526	0.72558	0.68660	0.18546	0.07722	0.41262	0.33967	0.14944	0.12558	0.27547	0.39126	0.26193	0.19300	0.18944	0.42290	0.29224
2007																													
Profit(%)	0.00175	0.00204	0.00599	-0.00850	-0.00795	0.00203	-0.00599	0.00148	0.01204	0.00927	-0.00143	-0.00938	-0.00192	-0.00165	0.00341	0.00408	0.00899	0.01013	0.00698	-0.00425	0.01751	0.01258	0.00542	0.01137	0.01853	0.01696	0.01719	-0.00176	-0.00917
T Stats	0.90115	0.88479	0.67118	0.54646	0.57274	0.88566	0.67105	0.91658	0.39297	0.51094	0.91936	0.50565	0.89185	0.90676	0.80877	0.77214	0.52350	0.47115	0.62038	0.76322	0.21360	0.38363	0.70079	0.41960	0.18800	0.22851	0.22214	0.90053	0.51554
Signed Ranked	0.69693	0.65904	0.58700	0.71158	0.74491	0.88114	0.61388	0.80468	0.29628	0.26365	0.85399	0.67939	0.86302	0.89737	0.67758	0.61503	0.35070	0.38666	0.30165	0.84369	0.07468	0.17291	0.36797	0.22275	0.06143	0.08675	0.09514	0.61793	0.82957
2008																													
Profit(%)	0.04308	0.01621	0.03352	0.02997	0.01638	0.00128	0.02027	0.00105	0.02430	0.04274	0.05705	0.03579	0.04214	0.03697	0.03719	0.03954	0.04569	0.03279	0.04080	0.05158	0.03986	0.03955	0.03967	0.04447	0.04136	0.03082	0.02572	0.04293	0.05548
T Stats	0.13703	0.57654	0.24767	0.30154	0.57248	0.96478	0.48487	0.97107	0.40242	0.14019	0.04859	0.21707	0.14592	0.20223	0.19957	0.17255	0.11472	0.25815	0.15922	0.07476	0.16903	0.17235	0.17110	0.12481	0.15346	0.28791	0.37534	0.13848	0.05516
Signed Ranked	0.03910	0.17527	0.05653	0.07840	0.24044	0.49098	0.20570	0.52470	0.15830	0.04884	0.00566	0.04322	0.02667	0.06817	0.08183	0.05784	0.06497	0.14877	0.03590	0.01289	0.05664	0.05795	0.05740	0.02400	0.05097	0.09629	0.17239	0.03481	0.01879
2009																													
Profit(%)	-0.01124	-0.01030	-0.00439	0.00950	0.02677	0.01020	-0.00202	0.00508	0.03804	0.00232	0.00486	-0.00142	0.00314	0.01619	0.01552	0.01063	0.00691	0.00118	0.00732	0.01508	0.02087	0.01780	0.02291	0.00718	0.00948	0.00521	0.00603	0.01312	0.01722
T Stats	0.63813	0.66600	0.88549	0.69116	0.62320	0.66969	0.93256	0.83179	0.11071	0.92256	0.83891	0.95273	0.89550	0.49815	0.62976	0.61647	0.77258	0.96069	0.79547	0.52803	0.38230	0.45643	0.33749	0.76396	0.69169	0.82763	0.80080	0.58296	0.47119
Signed Ranked	0.95741	0.86690	0.92930	0.39805	0.16853	0.37414	0.79706	0.66142	0.15301	0.63307	0.53873	0.79009	0.74615	0.44558	0.61272	0.70058	0.80977	0.88309	0.64541	0.51882	0.38892	0.41338	0.38485	0.86109	0.72017	0.82893	0.80786	0.50611	0.47354
2010																													
Profit(%)	0.01050	0.01690	0.01918	0.00790	0.00241	-0.01076	-0.00175	-0.01484	-0.01430	0.00534	0.01044	0.00493	0.00525	0.00902	0.01572	0.01974	0.01188	-0.00088	0.00832	0.00681	-0.00063	0.01750	0.02010	0.02778	0.01798	0.02724	0.03062	0.00466	0.01156
T Stats	0.65855	0.47695	0.41943	0.73949	0.91924	0.65071	0.94134	0.53239	0.54740	0.82217	0.66045	0.83554	0.82506	0.70436	0.50810	0.40602	0.61714	0.97059	0.72635	0.77446	0.97875	0.46146	0.39747	0.24185	0.44919	0.25121	0.19701	0.84440	0.62679
Signed Ranked	0.70852	0.65963	0.55295	0.79706	0.99345	0.72078	0.84305	0.65547	0.51298	0.85399	0.57966	0.81168	0.66858	0.49669	0.31614	0.20541	0.39897	0.55350	0.64600	0.69815	0.93126	0.43825	0.34521	0.14877	0.24880	0.09762	0.15088	0.80850	0.71097
All																													
Profit(%)																													

3_25	4_25	5_25	6_25	7_25	8_25	9_25	1_30	2_30	3_30	4_30	5_30	6_30	7_30	8_30	9_30	1_50	2_50	3_50	4_50	5_50	6_50	7_50	8_50	9_50	1_100	2_100	3_100	4_100	5_100	6_100	7_100	8_100	9_100
-0.01592	-0.02870	-0.02796	-0.02717	-0.02538	-0.02204	-0.03021	-0.00947	-0.02008	-0.02969	-0.02754	-0.03378	-0.03528	-0.03296	-0.03573	-0.03376	-0.01081	-0.01463	-0.02002	-0.01957	-0.02889	-0.02758	-0.03172	-0.02480	-0.02543	-0.03016	-0.01129	-0.01071	-0.01580	-0.01728	-0.02108	-0.01663	-0.02140	-0.02528
0.25946	0.04215	0.04773	0.05441	0.07288	0.11723	0.03204	0.50182	0.16253	0.03931	0.05636	0.01949	0.01514	0.02339	0.01386	0.01830	0.46340	0.32281	0.17533	0.18320	0.04883	0.06014	0.03124	0.09303	0.08490	0.13755	0.58188	0.60160	0.43890	0.40148	0.30358	0.41905	0.29766	0.21818
0.56061	0.16963	0.17223	0.22670	0.25119	0.41190	0.12151	0.73103	0.39984	0.12041	0.17313	0.08735	0.06575	0.10783	0.05269	0.06790	0.97011	0.82338	0.44995	0.42211	0.14996	0.19059	0.08892	0.22675	0.19150	0.24228	0.81154	0.82932	0.63188	0.63644	0.46253	0.64236	0.43301	0.30557
0.03409	0.03467	0.03474	0.03014	0.03020	0.02350	0.02392	0.03391	0.03842	0.04130	0.04136	0.03598	0.03654	0.03240	0.03202	0.02838	0.02819	0.02833	0.02736	0.02633	0.02835	0.03123	0.02733	0.02847	0.02671	0.00588	0.00755	0.00742	0.01050	0.00833	0.01198	0.01672	0.01424	0.00198
0.05089	0.04705	0.04656	0.08450	0.08393	0.17909	0.17151	0.05215	0.02760	0.01780	0.01763	0.03921	0.03624	0.06358	0.06681	0.10451	0.10685	0.10504	0.11757	0.13206	0.10480	0.07387	0.11801	0.10333	0.12658	0.73732	0.66669	0.67177	0.54875	0.63435	0.49398	0.33972	0.41618	0.91025
0.07271	0.06854	0.05776	0.08047	0.08412	0.19960	0.18494	0.06395	0.03610	0.01947	0.01907	0.03098	0.02831	0.05324	0.05607	0.08727	0.16161	0.09885	0.10389	0.12145	0.08985	0.07680	0.11817	0.09762	0.12780	0.77140	0.66651	0.70300	0.52390	0.63629	0.44425	0.27563	0.36967	0.61446
0.00540	0.00753	0.00122	0.00074	-0.00257	-0.00578	-0.00428	0.00141	-0.00232	0.00487	-0.00402	-0.00774	-0.00677	-0.00466	-0.00507	-0.01357	0.01499	0.00952	0.00445	0.00584	-0.00155	-0.00026	0.00226	-0.00302	0.00180	-0.00105	-0.00613	-0.01050	-0.00091	0.00052	0.00035	-0.00154	-0.00933	-0.00332
0.74482	0.64996	0.94116	0.96438	0.87689	0.72730	0.79627	0.93209	0.88885	0.76898	0.80833	0.64075	0.68329	0.77875	0.75963	0.41289	0.36594	0.56591	0.78858	0.72491	0.92540	0.98748	0.89156	0.85537	0.91367	0.94968	0.71156	0.52670	0.95605	0.97505	0.98325	0.92594	0.57354	0.84158
0.81904	0.72844	0.80919	0.82628	0.92017	0.90006	0.93496	0.83552	0.88201	0.80461	0.83288	0.70945	0.75272	0.86202	0.89872	0.61384	0.32134	0.51501	0.75529	0.69252	0.89872	0.86601	0.76753	0.96054	0.78959	0.70128	0.90340	0.81970	0.68754	0.64024	0.59553	0.72907	0.99764	0.81641
0.00313	-0.00514	-0.01520	-0.01309	-0.01525	-0.02390	-0.02436	0.01032	0.00702	0.00654	0.00058	0.00214	-0.00589	-0.00513	-0.01619	-0.01990	-0.01998	-0.01492	-0.02228	-0.01763	-0.01895	-0.02677	-0.03228	-0.02950	-0.02768	-0.02188	-0.02152	-0.02031	-0.01967	-0.01932	-0.01771	-0.02364	-0.02006	-0.01790
0.85759	0.76813	0.38307	0.45255	0.38161	0.16981	0.16174	0.55393	0.68713	0.70754	0.97362	0.90249	0.73537	0.76860	0.35269	0.25312	0.25140	0.39185	0.20062	0.31147	0.27668	0.12396	0.06326	0.08981	0.11163	0.20901	0.21647	0.24346	0.25876	0.26736	0.30943	0.17447	0.24935	0.30408
0.94600	0.83768	0.42735	0.49196	0.40117	0.32610	0.31274	0.57499	0.83378	0.81954	0.83249	0.91298	0.96520	0.98773	0.67679	0.51478	0.64426	0.83508	0.50889	0.70931	0.59097	0.33522	0.15653	0.24316	0.28371	0.62235	0.62588	0.59154	0.64247	0.66165	0.73672	0.49459	0.67375	0.78995
-0.00109	0.00570	-0.00115	-0.00413	0.01226	0.01211	-0.00106	-0.00454	0.00051	-0.00006	-0.00697	0.00023	0.00496	-0.00337	-0.00665	-0.01001	-0.00032	-0.00134	0.00118	0.01047	0.00998	0.00418	-0.00256	-0.00381	-0.00422	-0.01279	-0.00895	0.00248	0.00774	0.01099	0.00110	0.00130	0.00317	0.00751
0.95087	0.74769	0.94812	0.81568	0.48883	0.49420	0.95249	0.79769	0.97700	0.99751	0.69402	0.98951	0.77942	0.84919	0.70757	0.57193	0.98580	0.93993	0.94710	0.55433	0.57302	0.81363	0.88514	0.82983	0.81151	0.47003	0.61354	0.88860	0.66196	0.53501	0.95049	0.94163	0.85788	0.67173
0.89155	0.63464	0.96046	0.85445	0.54790	0.51054	0.92102	0.95651	0.80038	0.92561	0.72605	0.94467	0.88698	0.73475	0.55619	0.44000	0.57465	0.58712	0.63936	0.49211	0.51801	0.81061	0.82088	0.74224	0.71368	0.73351	0.90725	0.61998	0.67643	0.55453	0.99868	0.98352	0.89613	0.70814
-0.01679	-0.01237	-0.00774	-0.00269	-0.00636	-0.00429	0.00027	-0.00713	-0.01193	-0.00964	-0.00964	-0.00715	-0.00912	-0.01091	-0.00229	-0.01357	-0.01027	-0.00786	-0.01505	-0.00878	-0.01448	-0.00931	-0.01846	-0.01608	-0.01093	-0.00304	-0.00831	-0.00317	-0.00966	-0.00914	-0.00820	-0.00876	-0.01310	-0.00982
0.33225	0.47538	0.65513	0.87654	0.71363	0.80464	0.98747	0.68064	0.49119	0.57788	0.57796	0.67988	0.59871	0.52900	0.89485	0.43341	0.55355	0.65003	0.38498	0.61227	0.40335	0.59112	0.28632	0.35330	0.52827	0.86069	0.63177	0.85470	0.57744	0.59774	0.63629	0.61321	0.44945	0.57105
0.48149	0.73569	0.93185	0.75697	0.96606	0.84183	0.54707	0.99506	0.81799	0.90627	0.90561	0.97001	0.83537	0.75382	0.77273	0.67734	0.70906	0.85218	0.61735	0.81478	0.59254	0.92988	0.54817	0.66468	0.98780	0.96803	0.71337	0.98187	0.64320	0.66949	0.72079	0.67734	0.54762	0.61445
0.01283	0.01859	0.02186	0.01979	0.01273	0.01598	0.01085	0.01451	0.01887	0.01307	0.02255	0.02230	0.01823	0.01506	0.01310	0.00973	0.01746	0.01689	0.00985	0.01032	0.00264	0.00299	0.00915	0.01245	0.01477	0.02367	0.02217	0.02217	0.02478	0.02346	0.02346	0.02657	0.02657	0.02638
0.39711	0.21954	0.14844	0.19106	0.40093	0.29131	0.47416	0.33803	0.21260	0.38833	0.13610	0.14044	0.22857	0.32021	0.38713	0.52068	0.24881	0.26466	0.51556	0.49571	0.86161	0.84380	0.54581	0.41125	0.32934	0.11754	0.14277	0.14277	0.10124	0.12083	0.12083	0.07881	0.07881	0.08097
0.21529	0.10479	0.07289	0.09564	0.21309	0.18858	0.34095	0.20937	0.14824	0.25828	0.07939	0.08175	0.14729	0.19818	0.25936	0.36333	0.17040	0.20418	0.40498	0.40546	0.66988	0.64418	0.38196	0.26806	0.20176	0.07765	0.09362	0.09362	0.06359	0.08146	0.08146	0.05139	0.05139	0.05305
0.00881	0.00793	0.00757	0.01031	0.01447	0.00914	0.01294	-0.00213	0.00328	0.00644	-0.00005	0.00291	0.00057	0.00936	0.00896	0.01105	-0.00550	-0.00340	-0.00358	0.00280	0.00335	0.00602	0.00477	0.00508	0.00164	0.01527	0.00918	0.00721	0.01043	0.00717	0.01092	0.01137	0.01247	0.01206
0.53180	0.57394	0.59110	0.46430	0.30428	0.51656	0.35844	0.87997	0.81619	0.64797	0.99719	0.83628	0.96792	0.50683	0.52513	0.43285	0.69630	0.80949	0.79933	0.84286	0.81235	0.66940	0.73527	0.71873	0.90741	0.27842	0.51498	0.60923	0.45916	0.61128	0.43844	0.41981	0.37624	0.39197
0.27328	0.32497	0.34310	0.23196	0.14785	0.29098	0.14877	0.65606	0.51139	0.30126	0.53656	0.40035	0.50139	0.20541	0.22056	0.15182	0.72202	0.67458	0.68905	0.39028	0.36535	0.22684	0.28947	0.28611	0.40451	0.06040	0.14305	0.21289	0.13815	0.21349	0.13189	0.11884	0.10033	0.10810
0.05899	0.04216	0.04998	0.04504	0.04247	0.04153	0.02544	0.05225	0.06818	0.05725	0.05926	0.05770	0.05442	0.04249	0.03486	0.01743	0.04883	0.06135	0.04655	0.04977	0.04977	0.04229	0.02737	0.02212	0.02410	0.04296	0.04336	0.04336	0.04883	0.04285	0.04285	0.04092	0.04092	0.03834
0.04139	0.14566	0.08433	0.11999	0.14269	0.15180	0.38050	0.07106	0.01824	0.04781	0.04043	0.04607	0.06004	0.14253	0.22922	0.54812	0.09176	0.03383	0.10803	0.08563	0.08563	0.14447	0.34545	0.44583	0.40624	0.13812	0.13455	0.13455	0.09177	0.13921	0.13921	0.15798	0.15798	0.18595
0.01625	0.04357	0.02867	0.04623	0.06717	0.07700	0.17712	0.02490	0.00322	0.01592	0.01016	0.01238	0.02214	0.04374	0.09464	0.21017	0.04087	0.00696	0.03231	0.02013	0.02013	0.03158	0.06401	0.11403	0.10223	0.01040	0.00960	0.00960	0.00805	0.01442	0.01442	0.01622	0.01622	0.02374
0.01563	0.01272	0.00155	-0.00342	-0.00482	0.00489	0.00839	0.01426	0.01095	0.00842	0.00917	0.00901	0.01215	0.01120	0.01602	0.00859	0.00652	0.00920	0.00628	0.01394	0.01246	0.01066	0.00738	0.00115	0.00641	0.01307	0.01320	0.01466	0.01400	0.01486	0.00945	0.00601	0.01169	0.00937
0.51325	0.59450	0.94835	0.88618	0.84036	0.83802	0.72570	0.55072	0.64679	0.72465	0.70124	0.70611	0.61117	0.63932	0.50274	0.71943	0.78519	0.70035	0.79269	0.55986	0.60211	0.65552	0.75741	0.96151	0.78876	0.58437	0.58069	0.53967	0.55813	0.53404	0.69254	0.80166	0.62487	0.69505
0.57573	0.73684	0.93845	0.77306	0.68965	0.89932	0.73994	0.																										

Day With Transaction cost		Strategy																													
		1_10	2_10	3_10	4_10	5_10	6_10	7_10	8_10	9_10	1_15	2_15	3_15	4_15	5_15	6_15	7_15	8_15	9_15	1_20	2_20	3_20	4_20	5_20	6_20	7_20	8_20	9_20	1_25	2_25	
2000																															
Profit(%)		-0.00309	-0.00081	-0.01068	-0.01669	-0.00852	-0.01967	-0.02184	-0.00910	-0.00828	-0.02247	-0.01994	-0.02034	-0.01741	-0.01957	-0.01684	-0.02034	-0.01680	-0.02234	-0.01740	-0.01356	-0.01240	-0.01888	-0.02497	-0.02052	-0.02570	-0.02167	-0.01466	-0.00887		
T Stats		0.82483	0.95419	0.44905	0.23585	0.54357	0.16303	0.12370	0.51805	0.56931	0.11289	0.15981	0.15353	0.21921	0.16504	0.23317	0.15207	0.23662	0.11705	0.22017	0.33781	0.38026	0.18320	0.07922	0.15024	0.07187	0.07765	0.10514	0.30103	0.52892	
Signed Ranked		0.88573	0.89316	0.55881	0.32379	0.78506	0.35437	0.31636	0.86241	0.70221	0.27293	0.33916	0.29477	0.42594	0.29245	0.41530	0.27270	0.34600	0.24758	0.46422	0.61318	0.63828	0.33788	0.27597	0.46549	0.29891	0.28127	0.45781	0.48743	0.84188	
2001																															
Profit(%)		0.00703	0.02827	0.02152	0.02585	0.02089	0.01816	0.01874	0.01725	0.01916	0.01672	0.01731	0.01204	0.01421	0.01390	0.01740	0.02500	0.02900	0.01871	0.01122	0.02400	0.01760	0.01801	0.02212	0.03234	0.02246	0.02613	0.01604	0.02487	0.0261	
T Stats		0.69100	0.10705	0.22135	0.14054	0.23355	0.30085	0.28478	0.32629	0.27424	0.34228	0.32444	0.49534	0.41901	0.42965	0.32286	0.15270	0.09599	0.28510	0.52435	0.17005	0.31680	0.30547	0.20661	0.06350	0.19931	0.13415	0.36061	0.15624	0.1349	
Signed Ranked		0.79243	0.27412	0.21558	0.13320	0.22197	0.35007	0.39626	0.41704	0.38965	0.32979	0.35342	0.67338	0.45660	0.46966	0.42261	0.20447	0.14740	0.32020	0.62170	0.26999	0.36876	0.28804	0.26888	0.08002	0.21035	0.12544	0.39204	0.20973	0.20081	
2002																															
Profit(%)		0.01227	0.02607	0.01554	0.00225	0.01946	0.01219	0.00667	0.01794	0.00820	0.00994	0.01755	0.00774	0.01159	0.01003	-0.00067	-0.00374	-0.00585	-0.01124	0.01771	0.01725	0.01110	0.00799	0.00829	-0.00413	-0.01174	-0.00512	-0.00949	-0.00131	0.00747	
T Stats		0.45952	0.11428	0.34857	0.89315	0.24005	0.46277	0.68927	0.27960	0.62245	0.54917	0.28923	0.64208	0.48576	0.54715	0.96817	0.82236	0.72620	0.49978	0.28471	0.29912	0.50448	0.63104	0.61793	0.80442	0.48242	0.75857	0.56831	0.93720	0.65337	
Signed Ranked		0.59198	0.14860	0.36639	0.72146	0.16555	0.29654	0.52077	0.20806	0.41390	0.56082	0.21988	0.61947	0.51204	0.63725	0.87249	0.94639	0.94909	0.72971	0.23964	0.25384	0.49446	0.66587	0.66710	0.84213	0.60082	0.97335	0.78373	0.85870	0.57863	
2003																															
Profit(%)		0.01790	-0.00387	-0.00537	-0.01505	-0.01119	-0.00126	-0.00173	-0.01451	-0.03148	0.00874	0.00244	0.00083	0.00302	-0.00143	-0.00493	-0.00606	0.00311	0.00068	0.01554	0.00373	-0.00229	0.00742	0.01472	0.01040	-0.00093	-0.00154	0.01033	0.00677	-0.00508	
T Stats		0.30120	0.82572	0.75906	0.39098	0.52178	0.94249	0.92097	0.40720	0.07287	0.61703	0.88906	0.96200	0.86241	0.93486	0.77795	0.72928	0.85820	0.96864	0.37327	0.83173	0.89609	0.67036	0.39739	0.55071	0.95753	0.93011	0.55343	0.69815	0.77218	
Signed Ranked		0.37896	0.57215	0.47174	0.17383	0.29509	0.72172	0.93542	0.61941	0.10484	0.78192	0.82924	0.76954	0.89915	0.72297	0.61006	0.88338	0.64113	0.71800	0.36784	0.99736	0.80021	0.81308	0.45248	0.66890	0.90136	0.90791	0.55530	0.76420	0.61998	
2004																															
Profit(%)		-0.01322	0.00036	0.00107	-0.00406	-0.00478	0.00811	-0.00775	-0.00383	-0.00795	-0.00813	-0.00874	-0.00627	0.00130	-0.00444	0.00210	0.00539	0.00598	0.00315	-0.00765	-0.01309	-0.00093	0.00151	0.00897	0.00314	-0.00087	0.00223	0.00826	0.00058	-0.00958	
T Stats		0.45846	0.98394	0.95170	0.81979	0.78877	0.64747	0.66389	0.82976	0.65569	0.64769	0.62270	0.72385	0.94168	0.80326	0.90590	0.76146	0.73613	0.85885	0.66718	0.46182	0.95840	0.93195	0.61216	0.85905	0.96086	0.90002	0.64000	0.97369	0.58955	
Signed Ranked		0.84884	0.64364	0.51801	0.73724	0.97495	0.66138	0.56064	0.80150	0.79579	0.95152	0.90453	0.96441	0.88633	0.94467	0.74661	0.59970	0.58598	0.71615	0.77935	0.77431	0.88503	0.74912	0.52878	0.78192	0.93283	0.82603	0.68795	0.80214	0.71219	
2005																															
Profit(%)		0.00864	0.01153	0.00581	0.00616	-0.00023	0.00014	-0.00065	0.00527	0.00141	0.02066	0.01176	0.00660	0.01527	0.01378	0.00934	0.00560	0.00258	0.00329	0.00014	0.01190	0.00325	-0.00266	-0.00025	-0.01107	-0.00854	-0.00736	-0.00268	-0.00863	-0.01814	
T Stats		0.61902	0.50559	0.73806	0.72369	0.98959	0.99377	0.97013	0.76154	0.93560	0.23249	0.49869	0.70489	0.37914	0.42694	0.59119	0.74703	0.88188	0.84951	0.99343	0.49330	0.85216	0.87858	0.98847	0.52686	0.62396	0.67110	0.87729	0.61896	0.29727	
Signed Ranked		0.88927	0.72574	0.89351	0.94138	0.65600	0.64291	0.59511	0.82925	0.83247	0.33552	0.72636	0.83892	0.51054	0.68188	0.92495	0.95717	0.80517	0.81094	0.71831	0.81928	0.94565	0.83215	0.75445	0.88862	0.97396	0.97001	0.74881	0.97726	0.50975	
2006																															
Profit(%)		-0.01218	0.00543	-0.01679	-0.01303	-0.00927	-0.00443	-0.01225	-0.01158	-0.01703	-0.01479	-0.00660	0.00762	-0.00847	-0.00307	-0.00082	-0.00389	-0.00326	0.00741	0.01449	0.00404	0.01347	0.01453	0.00846	0.00562	0.01112	0.01181	0.01381	0.00118	0.00665	
T Stats		0.42264	0.71849	0.27056	0.39083	0.50444	0.34244	0.44502	0.26457	0.30174	0.66329	0.61322	0.57853	0.83902	0.95671	0.79813	0.82937	0.62297	0.33746	0.90541	0.75951	0.37334	0.33043	0.57713	0.71196	0.46295	0.43467	0.43617	0.93804	0.66039	
Signed Ranked		0.43938	0.69267	0.29107	0.57777	0.68648	0.42122	0.67543	0.40978	0.58066	0.80036	0.52156	0.86646	0.84205	0.70826	0.91696	0.92498	0.34181	0.16055	0.68101	0.54187	0.23476	0.17850	0.36021	0.51748	0.29890	0.25437	0.25900	0.65515	0.44884	
2007																															
Profit(%)		-0.00744	-0.00524	0.00024	-0.01463	-0.01446	-0.00449	-0.01174	-0.00504	0.00265	-0.00070	-0.00794	-0.01436	-0.00613	-0.00587	-0.00061	0.00044	0.00535	0.00649	-0.00260	-0.01076	0.01177	0.00825	0.00178	0.00773	0.01643	0.01485	0.01489	-0.00789	-0.01338	
T Stats		0.59925	0.71092	0.98657	0.30395	0.30457	0.74990	0.40703	0.72059	0.85045	0.96039	0.57472	0.31127	0.66449	0.67704	0.96541	0.97484	0.70362	0.64293	0.85314	0.44755	0.39971	0.55733	0.89971	0.58323	0.24424	0.29315	0.29151	0.57854	0.34601	
Signed Ranked		0.70607	0.88309	0.94760	0.44020	0.44362	0.71587	0.34352	0.79960	0.76239	0.78756	0.72507	0.45595	0.93256	0.82573	0.95022	0.81806	0.49305	0.55003	0.80786	0.75488	0.15612	0.27617	0.52792	0.36317	0.08767	0.12121	0.13381	0.99476	0.59951	
2008																															
Profit(%)		0.03621	0.01125	0.02894	0.02501	0.01142	-0.00387	0.01474	-0.00486	0.01723	0.03702	0.05247	0.03235	0.03908	0.03392	0.03394	0.03629	0.04244	0.02955	0.03545	0.04777	0.03719	0.03631	0.03681	0.04160	0.03888	0.02834	0.02362	0.03835	0.05281	
T Stats		0.21129	0.69903	0.31829	0.38868	0.69453	0.89423	0.61124	0.86713	0.55163	0.20071	0.06897	0.26468	0.17807	0.24241	0.24203	0.21068	0.14317	0.31028	0.22132	0.09828	0.20000	0.20999	0.20448	0.15076	0.17994	0.32940	0.41684	0.18603	0.06744	
Signed Ranked		0.07953	0.23978	0.08085	0.11466	0.33366	0.60620	0.29356	0.68723	0.26405	0.08285	0.01011	0.06029	0.03863	0.03605	0.08675	0.10363	0.08049	0.08974	0.18356	0.05751	0.01891	0.07307	0.07067	0.04441	0.03272	0.06342	0.11963	0.20056	0.05097	0.02328
2009																															
Profit(%)		-0.02120	-0.01720	-0.01090	0.00432	0.02160	0.00483	-0.00930	-0.00220	0.02731	-0.00438	0.00045	-0.00544	-0.00012	0.01332	0.00865	0.00776	0.00404	-0.00170	0.00215	0.01144	0.01762	0.01454	0.02004	0.00469	0.00699	0.00310	0.00392	0.00190	0.01281	
T Stats		0.37571	0.47280	0.64807	0.85607	0.36453	0.83994	0.69721	0.92656	0.24984	0.85514	0.94845	0.80511	0.99612	0.57711	0.71745	0.74603	0.86609	0.93287	0.63182	0.46040	0.54228	0.40156	0.84510	0.70091	0.89710	0.86955	0.70368	0.59188		
Signed Ranked		0.62485	0.63131	0.83662	0.55185	0.25529	0.50980	0.93910	0.92865	0.34436	0.89152	0.71342	0.94629	0.84433	0.51616	0.68844	0.80341	0.92799	0.99672	0.85399	0.64541	0.47303	0.49409	0.43971	0.94956	0.80532	0.89477	0.88503	0.66650	0.62431	
2010																															
Profit(%)		0.00322	0.01038	0.01420	0.00311	-0.00238	-0.01593	-0.00692	-0.02039	-0.02138	0.00017	0.00642	0.00091	0.00161	0.00576	0.01247	0.01686	0.00901	-0.00375	0.00238	0.00355	-0.00389	0.01424	0.01684	0.02453	0.01472	0.02398	0.02736	0.00026	0.00792	
T Stats		0.89230	0.66194	0.55010	0.89614	0.92087	0.50463	0.77148	0.39172	0.36947	0.99432	0.78764	0.96948	0.94594	0.80852	0.59958	0.47759	0.70496	0.87501	0.92048	0.88143	0.87044	0.54879	0.47730	0.30015	0.53504	0.31184	0.24879	0.99134	0.73933	
Signed Ranked		0.94956	0.89477	0.71403	0.97444	0.86173	0.56012	0.97575	0.46495	0.32700	0.91821	0.73622	0.95283	0.80023	0.60409	0.40683	0.26861	0.48787	0.63365	0.88309	0.82637	0.93061	0.53223	0.40730	0.19869	0.32863	0.136				

3_25	4_25	5_25	6_25	7_25	8_25	9_25	1_30	2_30	3_30	4_30	5_30	6_30	7_30	8_30	9_30	1_50	2_50	3_50	4_50	5_50	6_50	7_50	8_50	9_50	1_100	2_100	3_100	4_100	5_100	6_100	7_100	8_100	9_100
-0.01998	-0.02320	-0.03205	-0.03031	-0.02853	-0.02521	-0.03340	-0.01399	-0.02343	-0.03306	-0.03093	-0.03666	-0.03817	-0.03585	-0.03863	-0.03711	-0.01324	-0.01707	-0.02193	-0.02148	-0.03080	-0.02949	-0.03365	-0.02672	-0.02736	-0.03346	-0.01463	-0.01404	-0.01821	-0.01970	-0.02353	-0.01811	-0.02289	-0.02676
0.16158	0.02397	0.02440	0.03225	0.04394	0.07365	0.01838	0.32198	0.10674	0.02367	0.03345	0.01192	0.00872	0.01358	0.00796	0.00954	0.37476	0.25129	0.14015	0.14553	0.03676	0.04563	0.02262	0.06957	0.06287	0.10095	0.47219	0.49122	0.37528	0.33961	0.25240	0.37955	0.26776	0.19502
0.38134	0.10606	0.10904	0.15568	0.18840	0.29737	0.07749	0.50278	0.29465	0.07646	0.10486	0.05486	0.03817	0.06457	0.03089	0.03787	0.85463	0.69360	0.37335	0.35819	0.12199	0.14717	0.06670	0.18908	0.16214	0.18175	0.71444	0.72667	0.54059	0.56613	0.40229	0.59829	0.39910	0.28306
0.03160	0.03218	0.03264	0.02804	0.02809	0.02140	0.02181	0.03103	0.03670	0.03958	0.04041	0.03503	0.03559	0.03144	0.03106	0.02742	0.02608	0.02661	0.02564	0.02499	0.02739	0.03027	0.02637	0.02751	0.02575	0.00415	0.00620	0.00608	0.00916	0.00699	0.01064	0.01537	0.01290	0.00140
0.07041	0.06497	0.06168	0.10883	0.10868	0.22197	0.21321	0.07605	0.03538	0.02301	0.02042	0.04499	0.04184	0.07229	0.07590	0.11792	0.13687	0.12864	0.14286	0.15337	0.11710	0.08255	0.13092	0.11524	0.14098	0.81332	0.72379	0.72849	0.60060	0.68990	0.54357	0.37959	0.46164	0.93654
0.10134	0.09892	0.07637	0.10555	0.11085	0.24929	0.22683	0.09538	0.04677	0.02660	0.02272	0.03429	0.03228	0.06032	0.06346	0.09538	0.21861	0.12502	0.12780	0.14383	0.10117	0.08568	0.12801	0.10817	0.14789	0.85369	0.74146	0.76617	0.56598	0.69646	0.48828	0.31356	0.42809	0.63324
0.00252	0.00504	-0.00127	-0.00137	-0.00468	-0.00789	-0.00639	-0.00261	-0.00557	0.00238	-0.00651	-0.01061	-0.00926	-0.00677	-0.00680	-0.01530	0.01249	0.00780	0.00311	0.00450	-0.00289	-0.00122	0.00130	-0.00398	0.00084	-0.00507	-0.00901	-0.01299	-0.00340	-0.00159	-0.00099	-0.00288	-0.01067	-0.00466
0.87928	0.76211	0.93926	0.93460	0.77875	0.63514	0.70081	0.87565	0.73746	0.88636	0.69577	0.52383	0.57720	0.68375	0.68272	0.35842	0.45024	0.63923	0.85178	0.78687	0.86228	0.94172	0.93750	0.81071	0.95956	0.75971	0.58752	0.43511	0.83697	0.92362	0.95229	0.86224	0.52127	0.77910
0.97335	0.83882	0.91145	0.89136	0.97887	0.78885	0.85140	0.96930	0.95474	0.94470	0.73863	0.60942	0.64813	0.76243	0.82466	0.55740	0.38962	0.57632	0.79676	0.73927	0.94572	0.90006	0.80068	0.92958	0.81444	0.93294	0.93294	0.69940	0.80265	0.72336	0.64024	0.80003	0.93361	0.90810
-0.00032	-0.00821	-0.01788	-0.01577	-0.01793	-0.02620	-0.02665	0.00534	0.00319	0.00309	-0.00211	-0.00016	-0.00781	-0.00705	-0.01811	-0.02182	-0.02381	-0.01799	-0.02497	-0.02032	-0.02163	-0.02945	-0.03458	-0.03180	-0.02998	-0.02532	-0.02344	-0.02185	-0.02120	-0.02085	-0.01886	-0.02479	-0.02121	-0.01905
0.98546	0.63841	0.30811	0.36769	0.30580	0.13453	0.12830	0.75956	0.85493	0.85942	0.90414	0.99260	0.65532	0.68704	0.30165	0.21300	0.17388	0.30278	0.15242	0.24342	0.21428	0.09110	0.04718	0.06756	0.08527	0.14594	0.17951	0.20997	0.22314	0.23010	0.27916	0.15586	0.22291	0.27333
0.88141	0.70869	0.36529	0.40351	0.32039	0.27015	0.27051	0.77463	0.99436	0.98177	0.92683	0.99967	0.86962	0.89980	0.60143	0.45499	0.48830	0.69882	0.40117	0.57272	0.47431	0.24587	0.12199	0.18771	0.22390	0.49630	0.55508	0.53321	0.58524	0.59384	0.68166	0.45349	0.61531	0.73609
-0.00453	0.00303	-0.00344	-0.00642	0.00959	0.00982	-0.00335	-0.00950	-0.00254	-0.00311	-0.01002	-0.00206	0.00305	-0.00528	-0.00855	-0.01230	-0.00337	-0.00324	-0.00035	0.00933	0.00884	0.00303	-0.00370	-0.00495	-0.00537	-0.01585	-0.01124	0.00057	0.00660	0.00984	-0.00004	0.00015	0.00203	0.00674
0.79821	0.86408	0.84593	0.71788	0.58652	0.57846	0.85061	0.59152	0.88583	0.86076	0.57210	0.90762	0.86295	0.76639	0.63063	0.48874	0.84941	0.85495	0.98423	0.59861	0.61795	0.86444	0.83497	0.78066	0.76220	0.37317	0.52697	0.97409	0.70988	0.57885	0.99798	0.99314	0.90878	0.70330
0.93518	0.74553	0.94041	0.74740	0.64350	0.58712	0.82538	0.71158	0.94433	0.93678	0.59626	0.94203	0.96507	0.65958	0.49003	0.36535	0.68059	0.65428	0.68249	0.53639	0.56846	0.85381	0.77431	0.70446	0.66258	0.62373	0.82796	0.67758	0.71986	0.58427	0.94993	0.92364	0.95651	0.74661
-0.01949	-0.01468	-0.01005	-0.00462	-0.00828	-0.00621	-0.00165	-0.01136	-0.01501	-0.01195	-0.01157	-0.00908	-0.01104	-0.01283	-0.00421	-0.01550	-0.01411	-0.01094	-0.01774	-0.01071	-0.01640	-0.01123	-0.02039	-0.01762	-0.01247	-0.00497	-0.00984	-0.00471	-0.01081	-0.01030	-0.00935	-0.00991	-0.01426	-0.01059
0.26161	0.39680	0.56119	0.78943	0.63239	0.71991	0.92408	0.51288	0.38697	0.48996	0.50415	0.59991	0.52380	0.45945	0.80760	0.37215	0.41645	0.52803	0.30793	0.53668	0.34473	0.51631	0.24014	0.30987	0.47138	0.77495	0.57115	0.78576	0.53339	0.55297	0.58972	0.56751	0.41140	0.54162
0.40064	0.63552	0.81478	0.84895	0.92988	0.94105	0.61619	0.77843	0.67976	0.81671	0.80262	0.88470	0.75948	0.65391	0.86192	0.61969	0.51187	0.69374	0.49290	0.70538	0.50709	0.84765	0.48355	0.59769	0.89515	0.87297	0.64736	0.91479	0.59082	0.61445	0.66648	0.62377	0.49551	0.57043
0.00937	0.01589	0.01956	0.01748	0.01080	0.01406	0.00892	0.01105	0.01579	0.01076	0.02024	0.02038	0.01669	0.01352	0.01156	0.00858	0.01477	0.01497	0.00793	0.00879	0.00110	0.00145	0.00800	0.01130	0.01362	0.02252	0.02179	0.02179	0.02440	0.02308	0.02308	0.02618	0.02618	0.02599
0.53784	0.29400	0.19528	0.24832	0.47773	0.35389	0.55653	0.46629	0.29653	0.47839	0.17954	0.17672	0.27162	0.37362	0.44709	0.57203	0.32911	0.32283	0.60148	0.56373	0.94220	0.92393	0.59750	0.45546	0.36773	0.13693	0.15052	0.15052	0.10648	0.12692	0.12692	0.08291	0.08291	0.08560
0.30807	0.15113	0.10479	0.13421	0.26441	0.22945	0.38706	0.30286	0.21092	0.32113	0.10589	0.10461	0.18126	0.23947	0.30366	0.40498	0.22052	0.24634	0.46220	0.45906	0.72494	0.72685	0.42045	0.29969	0.22390	0.09262	0.09786	0.09786	0.06683	0.08541	0.08541	0.05454	0.05454	0.05562
0.00517	0.00544	0.00508	0.00821	0.01236	0.00704	0.01122	-0.00673	-0.00055	0.00356	-0.00216	0.00081	-0.00116	0.00802	0.00762	0.00971	-0.00895	-0.00570	-0.00569	0.00069	0.00162	0.00468	0.00381	0.00412	0.00068	0.01297	0.00765	0.00606	0.00890	0.00602	0.00977	0.01022	0.01132	0.01091
0.71275	0.69937	0.71888	0.56065	0.38013	0.61772	0.42606	0.63567	0.96877	0.80028	0.87890	0.95443	0.93476	0.56968	0.58925	0.49061	0.52850	0.68643	0.68622	0.96096	0.90813	0.73947	0.78713	0.77027	0.96151	0.35760	0.58844	0.66860	0.52766	0.67085	0.48833	0.46840	0.42260	0.43925
0.38937	0.42332	0.44215	0.29248	0.19271	0.37769	0.20423	0.90453	0.70424	0.40823	0.63834	0.49617	0.58135	0.26259	0.28203	0.19355	0.91039	0.81870	0.83342	0.48942	0.44951	0.28536	0.33355	0.31495	0.43437	0.08828	0.16599	0.23912	0.17632	0.24846	0.15301	0.13969	0.11651	0.13338
0.05727	0.04006	0.04788	0.04332	0.04076	0.03981	0.02373	0.04805	0.06551	0.05477	0.05678	0.05560	0.05232	0.04077	0.03315	0.01571	0.04577	0.05983	0.04521	0.04843	0.04843	0.04095	0.02603	0.02079	0.02276	0.04258	0.04297	0.04297	0.04844	0.04246	0.04246	0.04054	0.04054	0.03796
0.04764	0.16721	0.09801	0.13510	0.15955	0.16930	0.41434	0.09685	0.02316	0.05850	0.04969	0.05457	0.07076	0.16010	0.25375	0.58903	0.11409	0.03859	0.11919	0.09462	0.09462	0.15778	0.37010	0.47478	0.43334	0.14149	0.13785	0.13785	0.09416	0.14307	0.14307	0.16202	0.16202	0.19077
0.01951	0.05019	0.03211	0.05237	0.07854	0.09190	0.20130	0.03793	0.00455	0.02161	0.01360	0.01578	0.02966	0.05137	0.11029	0.23978	0.05237	0.00888	0.03778	0.02303	0.02303	0.03709	0.07320	0.12728	0.11403	0.01084	0.01016	0.01016	0.00823	0.01500	0.01500	0.01655	0.01655	0.02431
0.01237	0.00985	-0.00056	-0.00553	-0.00731	0.00240	0.00590	0.00986	0.00846	0.00593	0.00706	0.00691	0.01005	0.00948	0.01429	0.00725	0.00403	0.00709	0.00418	0.01259	0.01150	0.00971	0.00643	0.00020	0.00545	0.01193	0.01205	0.01389	0.01323	0.01410	0.00869	0.00524	0.01130	0.00899
0.60476	0.68019	0.98140	0.81742	0.76011	0.92003	0.80503	0.68008	0.72333	0.80415	0.76784	0.77293	0.67427	0.69157	0.54933	0.76213	0.86648	0.76672	0.86129	0.59821	0.63067	0.68498	0.78828	0.99347	0.81962	0.61773	0.61399	0.56081	0.57982	0.55538	0.71652	0.82657	0.63603	0.70687
0.69329	0.84498																																

Appendix 2

TABLE 7																					
10 min																					
Without Transaction cost																					
Year	Strategy	5.00000	10.00000	15.00000	20.00000	25.00000	30.00000	35.00000	40.00000	45.00000	50.00000	55.00000	60.00000	65.00000	70.00000	75.00000	80.00000	85.00000	90.00000	95.00000	100.00000
ALL																					
Profit(%)		-0.00031	-0.00024	-0.00029	-0.00024	-0.00027	-0.00029	-0.00026	-0.00027	-0.00022	-0.00020	-0.00023	-0.00023	-0.00019	-0.00015	-0.00014	-0.00015	-0.00015	-0.00013	-0.00011	-0.00009
T Stats (Pr > t)		0.00495	0.03076	0.00966	0.03179	0.01301	0.00867	0.01746	0.01638	0.05016	0.06899	0.04036	0.04022	0.07893	0.17855	0.19276	0.17895	0.16648	0.23811	0.33252	0.40448
Red Ranked (Pr >= t)		0.00000	0.00001	0.00001	0.00023	0.00021	0.00050	0.00390	0.00308	0.00507	0.00835	0.00685	0.00691	0.02378	0.08017	0.10230	0.13049	0.11138	0.21034	0.39794	0.47508
10 min																					
With Transaction cost																					
Year	Strategy	5.00000	10.00000	15.00000	20.00000	25.00000	30.00000	35.00000	40.00000	45.00000	50.00000	55.00000	60.00000	65.00000	70.00000	75.00000	80.00000	85.00000	90.00000	95.00000	100.00000
ALL																					
Profit(%)		-0.00304	-0.00185	-0.00148	-0.00120	-0.00108	-0.00099	-0.00087	-0.00081	-0.00070	-0.00064	-0.00064	-0.00061	-0.00055	-0.00047	-0.00045	-0.00043	-0.00015	-0.00013	-0.00011	-0.00009
T Stats (Pr > t)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00003	0.00008	0.00012	0.16648	0.23811	0.33252	0.40448
Red Ranked (Pr >= t)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00008	0.00010	0.00024	0.00065	0.00063	0.00084	0.00467	0.02279	0.03335	0.04597	0.11138	0.21034	0.39794	0.47508
TABLE 8																					
15 min																					
Without Transaction cost																					
Year	Strategy	5.00000	10.00000	15.00000	20.00000	25.00000	30.00000	35.00000	40.00000	45.00000	50.00000	55.00000	60.00000	65.00000	70.00000	75.00000	80.00000	85.00000	90.00000	95.00000	100.00000
ALL																					
Profit(%)		-0.00036	-0.00030	-0.00047	-0.00040	-0.00021	-0.00015	-0.00012	-0.00016	-0.00019	-0.00020	-0.00024	-0.00019	-0.00018	-0.00018	-0.00017	-0.00012	-0.00012	-0.00011	-0.00009	-0.00013
T Stats (Pr > t)		0.02838	0.06530	0.00457	0.01656	0.19349	0.37576	0.47507	0.34725	0.24070	0.21851	0.14875	0.23958	0.27970	0.27479	0.30135	0.46306	0.47128	0.52193	0.59415	0.42113
Red Ranked (Pr >= t)		0.00000	0.00008	0.00003	0.00120	0.03952	0.02418	0.05037	0.10332	0.09598	0.07668	0.06399	0.13205	0.16203	0.14138	0.17497	0.28645	0.40151	0.55295	0.57580	0.39178
15 min																					
With Transaction cost																					
Year	Strategy	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
ALL																					
Profit(%)		-0.00380	-0.00227	-0.00193	-0.00153	-0.00113	-0.00093	-0.00080	-0.00076	-0.00073	-0.00069	-0.00069	-0.00060	-0.00056	-0.00053	-0.00050	-0.00043	-0.00041	-0.00039	-0.00035	-0.00039
T Stats (Pr > t)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00002	0.00005	0.00005	0.00038	0.00099	0.00160	0.00293	0.00988	0.01369	0.02142	0.03493	0.01915
Red Ranked (Pr >= t)		0.00000	0.00000	0.00000	0.00000	0.00069	0.00062	0.000290	0.01249	0.01453	0.01365	0.01347	0.04077	0.05776	0.05539	0.07762	0.14902	0.23513	0.35883	0.39265	0.24288
TABLE 9																					
30 min																					
Without Transaction cost																					
Year	Strategy	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
ALL																					
Profit(%)		-0.00081	-0.00058	-0.00065	-0.00081	-0.00049	-0.00050	-0.00035	-0.00043	-0.00041	-0.00024	-0.00026	-0.00042	-0.00028	-0.00005	-0.00003	-0.00007	-0.00004	-0.00003	-0.00009	-0.00011
T Stats (Pr > t)		0.01274	0.07786	0.04577	0.01298	0.13633	0.12868	0.28835	0.19265	0.20949	0.47277	0.43185	0.19601	0.39656	0.87740	0.93234	0.83488	0.90707	0.92375	0.79291	0.73541
Red Ranked (Pr >= t)		0.00000	0.00027	0.00090	0.00008	0.00461	0.02861	0.16885	0.13013	0.26181	0.59493	0.57357	0.27599	0.64620	0.97301	0.90479	0.73316	0.94071	0.83985	0.77260	0.71130

30 min																					
With Transaction cost																					
Strategy	Year	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
ALL																					
Profit(%)		-0.00514	-0.00300	-0.00233	-0.00215	-0.00154	-0.00139	-0.00112	-0.00112	-0.00103	-0.00078	-0.00076	-0.00091	-0.00072	-0.00045	-0.00040	-0.00043	-0.00037	-0.00034	-0.00039	-0.00039
T Stats (Pr > t)		0.00000	0.00000	0.00000	0.00000	0.00001	0.00004	0.00085	0.00084	0.00208	0.02020	0.02310	0.00631	0.03137	0.17685	0.22577	0.19853	0.26830	0.29902	0.24463	0.23387
ned Ranked (Pr >= t)		0.00000	0.00000	0.00000	0.00000	0.00010	0.00204	0.03188	0.03210	0.09878	0.32062	0.32381	0.12642	0.40022	0.76086	0.64668	0.50779	0.71966	0.63977	0.58900	0.53371
TABLE 10																					
60 min																					
Without Transaction cost																					
Strategy	Year	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
ALL																					
Profit(%)		-0.00113	-0.00107	-0.00044	-0.00017	-0.00006	-0.00006	-0.00024	0.00000	0.00004	0.00013	0.00013	0.00026	0.00035	0.00037	0.00041	0.00068	0.00049	0.00046	0.00037	0.00020
T Stats (Pr > t)		0.07773	0.09388	0.48919	0.79076	0.92757	0.92905	0.70851	0.99385	0.94865	0.83817	0.83948	0.68603	0.58716	0.56951	0.52207	0.28763	0.44914	0.47040	0.56732	0.75686
ned Ranked (Pr >= t)		0.00174	0.00370	0.10773	0.24786	0.64657	0.51852	0.65161	0.56186	0.63244	0.53809	0.54370	0.87589	0.94417	0.98050	0.97869	0.72348	0.84901	0.71911	0.73997	0.77142
60 min																					
With Transaction cost																					
Strategy	Year	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
ALL																					
Profit(%)		-0.00606	-0.00371	-0.00227	-0.00157	-0.00115	-0.00100	-0.00106	-0.00070	-0.00058	-0.00043	-0.00039	-0.00021	-0.00008	-0.00004	0.00003	0.00035	0.00017	0.00016	0.00008	-0.00008
T Stats (Pr > t)		0.00000	0.00000	0.00063	0.01742	0.07984	0.12679	0.10658	0.28459	0.37192	0.51064	0.55225	0.74818	0.90607	0.94599	0.95820	0.59318	0.79894	0.80028	0.90430	0.90144
ned Ranked (Pr >= t)		0.00000	0.00000	0.00472	0.03732	0.25622	0.22318	0.36701	0.31709	0.39678	0.33450	0.35543	0.65851	0.85736	0.79712	0.80147	0.89015	0.98505	0.85142	0.85406	0.87883
TABLE 11																					
day																					
Without Transaction cost																					
Strategy	Year	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Profit(%)		-0.00292	0.00621	-0.00103	0.00196	-0.00091	-0.00091	-0.00091	-0.00091	-0.00091	-0.00091	-0.00091	-0.00091	-0.00091	-0.00477	-0.00477	-0.00477	-0.00477	-0.00477	-0.00477	-0.00477
T Stats (Pr > t)		0.63319	0.30947	0.86605	0.75479	0.88485	0.88485	0.88485	0.88485	0.88485	0.88485	0.88485	0.88485	0.88485	0.44742	0.44742	0.44742	0.44742	0.44742	0.44742	0.44742
ned Ranked (Pr >= t)		0.57242	0.22549	0.92900	0.27538	0.43665	0.43665	0.43665	0.43665	0.43665	0.43665	0.43665	0.43665	0.43665	0.72549	0.72549	0.72549	0.72549	0.72549	0.72549	0.72549
day																					
With Transaction cost																					
Strategy	Year	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
ALL																					
Profit(%)		-0.00319	0.00599	-0.00115	0.00187	-0.00100	-0.00100	-0.00100	-0.00100	-0.00100	-0.00100	-0.00100	-0.00100	-0.00100	-0.00486	-0.00486	-0.00486	-0.00486	-0.00486	-0.00486	-0.00486
T Stats (Pr > t)		0.60196	0.32720	0.85028	0.76559	0.87380	0.87380	0.87380	0.87380	0.87380	0.87380	0.87380	0.87380	0.87380	0.43923	0.43923	0.43923	0.43923	0.43923	0.43923	0.43923
ned Ranked (Pr >= t)		0.55830	0.23363	0.94112	0.27836	0.44028	0.44028	0.44028	0.44028	0.44028	0.44028	0.44028	0.44028	0.44028	0.71953	0.71953	0.71953	0.71953	0.71953	0.71953	0.71953

Appendix 3

TABLE 12

ten minutes	strategy1_10	strategy2_10	strategy3_10	strategy4_10	strategy5_10	strategy6_10	strategy7_10	strategy8_10	strategy9_10	strategy10_10	strategy11_10	strategy12_10	strategy13_10	strategy14_10	strategy15_10	strategy16_10	strategy17_10	strategy18_10	strategy19_10	strategy20_10	strategy21_10	strategy22_10	strategy23_10	strategy24_10	strategy25_10	strategy26_10	strategy27_10	strategy28_10	strategy29_10	strategy30_10	strategy31_10	strategy32_10	strategy33_10	strategy34_10	strategy35_10		
ALL																																					
Profit of Long	-2.00963E-05	-9.84814E-05	-8.10635E-05	-8.7801E-05	-0.000123267	-0.000108556	-0.000159128	-1.74484E-05	-2.42495E-05	-0.00014084	2.7888E-05	-0.000172344	-0.00039506	-0.00022789	-0.000207738	-0.000196239	-0.000219868	-0.000116313	-0.000260694	-5.29038E-05	-7.1881E-05	-0.000153413	-7.65625E-05	-0.000219901	-0.00025834	-0.000288971	-0.000394607	-0.000255656	4.93459E-05	-4.54312E-05							
T Stats	0.896168252	0.548342046	0.600398048	0.573506643	0.423110904	0.483234793	0.30452112	0.910203707	0.87456893	0.363945002	0.856879672	0.26606658	0.048913631	0.141704122	0.1567472	0.205725173	0.156740621	0.45176082	0.09435446	0.733278032	0.64475028	0.323399948	0.620598136	0.157453161	0.097504241	0.086064659	0.050352837	0.102344025	0.750976824	0.770893473							
Signed Ranked	0.000331202	5.67122E-05	0.000499632	0.03202805	0.000751332	0.009452219	0.001265002	0.044473338	0.047403683	0.000354489	0.00616471	0.000110297	1.26511E-05	0.000158445	0.00081004	0.000113470	0.000773254	0.004947078	4.7338E-05	0.000936076	0.000181643	0.000402109	0.000621024	0.000197032	0.000260669	7.47297E-05	5.18792E-05	0.019663408	0.04525563								
Profit of Short	0.000384225	0.000188206	0.000214416	-2.15844E-05	-4.38976E-05	-0.000235867	-0.00014157	-0.000109274	1.48212E-05	0.000202827	4.86736E-05	1.41956E-06	-9.31536E-07	-6.68219E-05	-9.69244E-05	-1.12383E-05	-7.41296E-05	0.000221259	9.14444E-05	4.05888E-05	2.09963E-05	-7.31697E-05	-4.26566E-05	-8.79699E-06	0.000129664	-3.56521E-05	6.95638E-05										
T Stats	0.231074947	0.219119164	0.160507676	0.807494143	0.775497925	0.123329534	0.354277379	0.374053031	0.923403199	0.184137517	0.750702359	0.861768282	0.902594082	0.995134722	0.66103083	0.529007002	0.941293629	0.628623588	0.145648075	0.549033528	0.78189288	0.890501539	0.632385161	0.584800918	0.539236336	0.778692095	0.953928698	0.391860605	0.815046885	0.647025286							
Signed Ranked	0.238104684	0.689213743	0.980356261	0.141097813	0.2025942	0.002390633	0.069882266	0.2131359	0.558725953	0.519277852	0.266222678	0.211107083	0.283745316	0.407053624	0.325799643	0.270332826	0.481428536	0.271426195	0.808855102	0.330767649	0.2740963	0.309508933	0.170575981	0.272308061	0.275027568	0.484001862	0.340278069	0.128663265	0.513857723								
No. of long	10223	7820	6902	6535	6442	6578	7024	8031	10725	8174	6163	5221	4762	4509	4371	4302	4337	4438	7051	5220	4418	3934	3669	3488	3385	3302	3258	6250	4628	3853							
No. of short	10223	7820	6902	6535	6443	6579	7025	8032	10726	8174	6163	5221	4762	4509	4371	4302	4337	4438	7051	5220	4418	3934	3669	3488	3384	3301	3257	6250	4628	3853							
total no of days (long)	55659	55562	55343	55463	55711	55600	55485	55705	55845	55468	55343	55288	55393	55441	55365	55306	55291	55405	55245	55239	55266	55291	55275	55207	55245	55263	55125	55171	55014	55035							
total no of days (short)	56439	56356	56755	56635	56387	56498	56613	56393	56253	56630	56755	56809	56705	56657	56733	56792	56807	56693	56853	56859	56892	56807	56823	56891	56853	56835	56973	56927	57084	57063							
average no of days (long)	5.444487919	7.105115509	8.018400658	8.487069625	8.487069625	8.452417148	7.899345103	6.936247043	5.206993097	6.785906533	8.978679929	10.58973377	11.632229735	12.29563096	12.66643788	12.85588099	12.7486742	12.4842722	7.835058857	10.58218391	12.4956694	14.054651175	15.06541292	15.82769495	16.32053176	16.73622047	16.9188995	8.82736	11.8922476	14.28367506							
average no of days (short)	5.520786462	7.226667189	8.21787629	8.665085679	8.751668477	8.57672729	8.058790036	7.021040837	5.24549653	6.928064595	9.208891129	10.88086573	11.90781184	12.56531382	12.97490495	13.20130172	13.0862458	12.7744795	8.063111615	10.89253874	12.73722025	14.44001017	15.48732625	16.3049311	16.80053191	17.21750985	17.40274774	9.10832	12.33981842	14.81001817							
2008																																					
Profit of Long	0.00047457	0.00033911	0.00049	0.000257173	0.00019088	1.85947E-05	-4.91558E-05	0.000357685	0.000291247	0.000183359	0.000318311	5.63804E-06	-0.000288817	-0.00011642	-0.000229508	-0.000288655	-0.000255502	0.000167451	-6.31888E-05	6.87395E-05	4.04591E-05	-0.000116789	-1.40961E-05	-7.0117E-05	-0.00020307	9.04735E-05	1.49448E-05	5.62402E-05	0.000255579	0.00025547							
T Stats	0.11961383	0.276111763	0.14939456	0.402945859	0.531349734	0.951577889	0.872630983	0.243818104	0.368831232	0.550214916	0.301219827	0.985476517	0.348620063	0.705975935	0.45924502	0.35142604	0.400801918	0.583591228	0.837560379	0.823521925	0.896465882	0.704291654	0.963370219	0.802742661	0.820426764	0.769900074	0.961300734	0.855230725	0.405639712	0.405639712							
Signed Ranked	0.944427286	0.64893483	0.723586023	0.655932828	0.572673619	0.44516777	0.235092283	0.572673619	0.935667337	0.935667337	0.935667337	0.935667337	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767	0.175584767		
Profit of Short	-2.61768E-05	0.000239559	0.000143253	7.83168E-05	0.000104723	1.24872E-05	1.47724E-05	-0.000274646	-1.80013E-06	-4.38779E-06	-2.87737E-05	-8.37579E-05	-0.000202361	-0.000266321	-0.000340455	-0.00022197	1.27077E-05	-0.00033805	-4.84455E-05	1.94673E-05	8.01348E-05	-3.91413E-05	-0.000176824	-0.000244063	-0.000185206	-0.00026684	-0.000319517	-2.61543E-05	-3.45582E-05	3.79602E-05							
T Stats	0.915109664	0.446464277	0.632521554	0.79382033	0.728805894	0.966914789	0.908833826	0.361099246	0.997164391	0.988357371	0.923664337	0.778711189	0.49522168	0.373136329	0.252563317	0.681176693	0.966077992	0.263113476	0.870480669	0.948169796	0.787211995	0.896124881	0.556502188	0.413459881	0.534267023	0.371418316	0.286708005	0.93042545	0.908451123	0.89845384							
Signed Ranked	0.127132944	0.856547799	0.581465404	0.485045903	0.788342153	0.358786894	0.405522564	0.285919023	0.710139795	0.241806743	0.28416327	0.167934869	0.189180684	0.118567898	0.103466267	0.372551596	0.494495799	0.08042881	0.21274851	0.381033373	0.269857452	0.158548574	0.17967943	0.264707602	0.096433043	0.040822878	0.186894374	0.29151054	0.415091781								
No. of long	3354	2508	2221	2082	2066	2104	2246	2584	3463	2678	1974	1675	1544	1473	1415	1374	1392	1415	2304	1703	1438	1291	1189	1132	1091	1078	1058	2057	1509	1258							
No. of short	3354	2508	2221	2083	2067	2105	2247	2585	3464	2678	1974	1675	1544	1473	1415	1374	1392	1415	2304	1703	1438	1291	1189	1132	1091	1078	1057	2057	1509	1258							
total no of days (long)	17857	17910	17819	17837	17881	17868	17815	17838	17917	17723	17763	17668	17624	17670	17694	17663	17638	17704	17759	17635	17598	17565	17643	17625	17649	17643	17625	17605	17675	17602	17568						
total no of days (short)	17930	17877	17968	17950	17906	17907	17972	17929	17870	18064	18119	18163	18171	18039	18124	18149	18083	18028	18152	18189	18222	18150	18138	18144	18162	18138	18182	18130	18185	18219							
average no of days (long)	5.324090638	7.14148235	8.002266226	8.56724036	8.654888674	8.498088953	7.931878896	6.910990712	5.173837132	6.617998056	8.93053461	10.52173104	12.48286551	12.02212596	12.48286551	12.83997234	12.7183908	12.5053004	7.654079861	10.33352007	12.23189415	13.66150271	14.843566602	15.98568905	16.15490376	16.40241636	16.63888658	8.58389599	11.66467878	13.9502385							
average no of days (short)	5.345855695	7.127990431	8.064408641	8.617370781	8.662796323	8.506888261	7.980219849	6.955783368	5.15759882	6.745323238	9.178824721	10.484582019	11.73380629	12.28309572	12.80848057	13.20867918	12.99606092	12.74063094	7.87847222	10.6805671	12.68941504	14.05886909	15.2548636	16.02826855	16.6628532	16.87253814	17.2015372	8.813806514	12.05102717	14.40251192							
2009																																					
Profit of Long	-0.000371244	-0.00033077	-0.000446134	-0.000231744	-0.000197883	2.71033E-05	2.883386E-05	-1.03306E-05	5.59122E-06	-0.00027437	3.77793E-05	-2.28122E-05	-3.47325E-05	-0.000122	2.89433E-05	5.08453E-05	-5.92316E-05	-0.00014217	-0.000194186	5.50256E-05	0.000106373	3.31981E-05	0.00014384	-3.87555E-05	-7.35258E-05	-0.000381851	-0.000364054	-0.000239082	5.61343E-05	-0.000104979							
T Stats	0.146046294	0.192476047	0.079384894	0.363970867	0.431361093	0.914715149	0.9059529	0.967693785	0.982437123	0.280174729	0.980758425	0.92784677	0.890168558	0.629481391	0.90																						

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-0.01401781	-0.024762711	-0.02944669	-0.01355937	-0.0150466926	-0.02181306	-0.004013463	-0.002084889	-0.003995878	-0.01157121	0.011811594	-0.001803951	-0.01195887	-0.015472443	-0.017010347	-0.018274316	-0.021900161	-0.036853421	-0.026143381	-0.030361927	-0.040889719	-0.043876453	-0.05122277	-0.030008444	-0.043171031	-0.060077927	-0.047154739	-0.047169918	-0.032241434	-0.042000914	-0.038454511	-0.038793364	
0.58129391	0.328619052	0.710154536	0.592417382	0.552701070	0.39284765	0.87313995	0.936399519	0.876502232	0.94377769	0.628822443	0.941356783	0.96081655	0.52337578	0.485097052	0.473497263	0.3693352	0.171349867	0.33948226	0.259917095	0.092181121	0.098953425	0.078471338	0.049585615	0.315454555	0.145917143	0.046709915	0.122409779	0.125561518	0.303645718	0.173187993	0.22147484	0.212348314
0.46408415	0.25406439	0.570432936	0.453013807	0.450983666	0.295561757	0.802588076	0.763955488	0.682848654	0.896711642	0.642431559	0.862596997	0.88373089	0.510925243	0.440531373	0.70565772	0.454514062	0.319611161	0.54774842	0.425793282	0.16237692	0.159130214	0.160338788	0.102951794	0.582227326	0.29906143	0.11108002	0.277367533	0.29850814	0.58858195	0.365158432	0.488135165	0.469670491
0.020530148	-0.00807515	-0.016145453	-0.01675895	-0.03178587	-0.02655328	0.022144981	0.014085791	0.015512949	0.00208464	-0.006620102	-0.009595395	-0.008745834	-0.016857875	-0.02243655	-0.021227704	0.010150376	-0.012477018	-0.012086033	-0.01143942	-0.013966766	-0.024158999	-0.017951493	-0.011316948	-0.017738699	-0.010698989	0.000269801	-0.005449121	-0.004897939	-0.010058195	-0.013976786	-0.010546655	-0.00891035
0.91632649	0.777692184	0.501919478	0.488760261	0.187801513	0.267159805	0.360691894	0.549192180	0.514905011	0.930565964	0.790410595	0.699329072	0.726444401	0.50115674	0.366718295	0.371901446	0.675322841	0.586565431	0.594120975	0.626756809	0.544266641	0.292798632	0.442137188	0.627133564	0.40592165	0.619706749	0.990168972	0.797598439	0.816392352	0.61038054	0.508100718	0.613947153	0.742470848
0.64658812	0.944889305	0.698763284	0.687107877	0.546445454	0.731182129	0.309527683	0.421436419	0.625225043	0.753096072	0.925176579	0.897205441	0.970933263	0.844976013	0.738165552	0.76774369	0.958881778	0.971477729	0.94204812	0.912549249	0.473808173	0.692503497	0.925626997	0.823783534	0.887411376	0.621934016	0.829766075	0.838158018	0.991966061	0.851913532	1	0.828897421	
8	7	7	7	6	6	13	10	9	7	6	5	5	5	5	10	8	7	7	7	7	6	6	6	5	4	4	4	4	3	3	3	3
8	7	7	7	6	6	13	10	9	7	6	5	5	5	5	10	8	7	7	7	7	6	6	6	5	4	4	4	4	3	3	3	3
121	122	119	121	123	121	118	124	120	122	124	124	125	125	122	105	105	103	106	108	107	108	107	88	87	88	89	89	89	90	90	88	90
140	139	142	140	138	140	143	147	141	139	137	137	136	139	156	155	159	158	155	153	154	153	154	173	174	172	172	172	171	171	172	171	171
15.125	17.42857143	17	17.28571429	20.5	20.16666667	9.076923077	11.4	13.33333333	17.42857143	20.66666667	24.8	25	25	24.4	10.5	13.25	15	14.71428571	15.14285714	15.42857143	17.83333333	18	17.83333333	9.777777778	17.4	22.25	22.25	22.25	30	30	29.66666667	30
17.5	19.85714286	20.28571429	20	23	23.33333333	11	14.7	15.66666667	19.85714286	23.33333333	27.4	27.2	27.2	27.8	18.5	19.375	22.28571429	22.14285714	22.14285714	25.66666667	25.5	25.66666667	19.22222222	34.8	43	43	43	57	57	57	57	57
-0.01514131	-0.013014274	-0.033467941	0.005412511	0.00630627	-0.043469781	-0.038469342	-0.022399379	-0.011977044	-0.020737499	-0.024532333	-0.01181551	-0.030630712	-0.03386574	-0.047779375	-0.044350009	-0.052186523	-0.043334912	0.002498126	0.004187678	-0.023544228	-0.028580286	-0.028651957	-0.028955148	-0.064560362	-0.057051931	-0.016681289	-0.006617662	-0.039806964	-0.03967539	-0.028313923	-0.021604764	-0.0114891418
0.96779114	0.72175652	0.342516295	0.870828997	0.802856348	0.215646576	0.258911691	0.542064472	0.751092074	0.59465731	0.480481722	0.736110341	0.369211677	0.320653152	0.15790154	0.19609002	0.141837699	0.1996402	0.944558055	0.936881788	0.46909715	0.412472497	0.4046114	0.406704885	0.03512019	0.059224092	0.544562032	0.83079527	0.900564235	0.322191929	0.365702623	0.488961269	0.715787138
0.919072328	0.6898891	0.35670324	0.938650472	0.807901877	0.169916355	0.246711437	0.525870119	0.688424464	0.58842243	0.51181007	0.653851243	0.319582738	0.248788564	0.08365164	0.44104275	0.382446242	0.543154436	0.831963829	0.794728905	0.410665705	0.331695991	0.012717785	0.316416158	0.095337243	0.152916608	0.826757205	0.716968599	0.735898824	0.218549806	0.012478472	0.307595916	0.60791562
0.009162761	0.004704213	0.010295891	0.015420328	0.013781219	0.016266367	0.021617543	0.012679544	0.005567647	-0.003507514	0.012757926	0.013016556	0.010184263	0.006882724	0.00809744	0.020613238	0.02021776	0.022553652	0.014413022	0.012844222	0.016389941	0.009921236	0.008332357	0.007445578	0.015222494	0.021791257	0.013563937	0.016326974	0.019743304	0.0195139	0.028141962	0.017267391	0.018493979
0.622983245	0.807251606	0.610513172	0.445296993	0.499550108	0.367123044	0.510504493	0.529572942	0.771483189	0.985491375	0.526522111	0.51932364	0.618766588	0.736715769	0.694627046	0.307598617	0.297119154	0.273912477	0.47831884	0.528692001	0.35674824	0.625857327	0.683087492	0.713757115	0.481447739	0.409681732	0.556381224	0.447813624	0.355822626	0.349704465	0.396539047	0.420840395	0.394549491
0.467828028	0.708695909	0.56840767	0.433083837	0.406036881	0.361214457	0.362857945	0.375067495	0.646320754	0.962435011	0.482968025	0.668046666	0.82979995	0.740827129	1.78821513	0.171830295	0.267796118	0.421765413	0.500325242	0.323170567	0.616555841	0.692204611	0.713003376	0.386502335	0.33455693	0.402348708	0.371248336	0.274733346	0.2948887	0.344802904	0.372023847	0.34284562	
7	6	6	7	6	6	13	8	8	8	6	5	5	5	6	8	5	4	3	3	3	3	3	3	8	6	5	3	3	3	3	3	2
7	6	6	7	6	6	13	8	8	8	6	5	5	5	6	8	5	4	3	3	3	3	3	3	8	6	5	3	3	3	3	3	2
85	87	86	83	85	82	88	88	84	85	88	85	87	87	85	85	86	85	85	85	86	84	92	94	96	96	97	97	95	95	95	96	96
166	164	163	168	166	169	164	167	166	164	166	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164	164
12.14285714	14.5	14.33333333	11.85714286	14.16666667	13.66666667	6.789230769	11	10.5	10.62	14.66666667	17	17.4	17.4	14.16666667	10.625	16	21.25	28.66666667	28.66666667	28.33333333	28.33333333	28.66666667	28	11.5	15.66666667	19.2	32.66666667	32.33333333	32.33333333	31.66666667	31.66666667	48
23.71428571	27.33333333	27.5	24	27.66666667	28.16666667	12.5846154	20.375	20.875	20.75	27.16666667	33.2	32.8	32.8	27.66666667	20.75	34.2	41.5	55	55	55.33333333	55.33333333	55	55.66666667	19.875	26.16666667	31	51	51.33333333	51.33333333	52	52	77.5
-0.008378652	-0.01131995	-0.002961133	0.00416398	-0.002543889	0.00625748	-0.004053024	-0.01403799	-0.009515536	-0.00471894	-0.00918746	-0.010162566	-0.004122427	0.008019391	-0.002465261	-0.007288367	-0.010673279	0.0002127549	0.0005468	-0.006729265	-0.002222063	-0.001547633	-0.009797974	-0.001286356	0.000119335	-0.003797683	0.008945387	-0.000359545	-0.002479255	-0.001039482	-0.004158887	-0.007849629	-0.00025289
0.727407253	0.63863698	0.901556799	0.861957236	0.912678802	0.798634583	0.86267363	0.5532488	0.684577071	0.841904598	0.69747753	0.655029192	0.971978517	0.737214115	0.918619177	0.759550597	0.649095367	0.729706198	0.97808866	0.773814157	0.922463409	0.654885535	0.676865199	0.956012466	0.888474899	0.862414912	0.679626424	0.96924664	0.90868057	0.9619137	0.84826526	0.721106513	0.990721199
0.960967677	0.93538576	0.6968158	0.466218432	0.73436258	0.420538291	0.782845809	0.841581395	0.977736534	0.78354381	0.97822576	0.948676814	0.714770168	0.417955065	0.790382386	0.95990097	0.845716432	0.573074343	0.66952599	0.880513909	0.726174115	0.960138957	0.958662191	0.553291772	0.732351929	0.992510851	0.430473463	0.787487756	0.88646713	0.854951716	0.982235353	0.956378804	0.817214428
-0.018071453	-0.002855973	-0.00230389	-0.02189855	-0.006675989	-0.007892942	-0.01183073	-0.008771611	-0.009843614	-0.016910101	-0.004099041	-0.006903051	-0.002119271	-0.017778159	-0.029971942	-0.014664388	-0.003650135	-0.023160025	-0.026478647	-0.027025632	-0.038075504	-0.026107991	-0.014688743	-0.016678955	-0.02571584	-0.027214661	-0.01735647	-0.021744329	-0.01703638	-0.0228631	-0.028195918		
0.46100762	0.91582448	0.925582734	0.31765551	0.783584994	0.739622022	0.64239255	0.72595889	0.69452578	0.50105154	0.870239434	0.78159499	0.286172581	0.466795478	0.214001407	0.554554932	0.886146885	0.098410303	0.35711877	0.29678908	0.437897396	0.217842778	0.30764226	0.306104029	0.617891592	0.557677504	0.371428773	0.336178402	0.444559946	0.450778782	0.541975934	0.417718536	0.32815235
0.586884179	0.9609239	0.960763161	0.435248344	0.950648953																												

2007	Profit of Long	-0.03952522	-0.02129706	-0.02354015	-0.05847394	-0.04936441	-0.03671696	-0.04032538	-0.03204437	-0.0909332	-0.020821284	-0.03894745	-0.043531755	-0.02520007	-0.024275738	-0.03146157	-0.02489295	-0.015621548	-0.035334831	-0.017284895	-0.031652846	-0.005588439	-0.010040934	-0.012409495	-0.006194267	-0.011460112	-0.005957851	-0.011009912	-0.024522249	-0.03329918	-0.006492918
	T Stats	0.11572326	0.37457741	0.16236091	0.03434072	0.09007606	0.06655388	0.144557366	0.08767238	0.07333673	0.0969035	0.27827654	0.54931516	0.29418326	0.51833142	0.13349864	0.46667825	0.164318225	0.76516779	0.63863761	0.006367619	0.006367619	0.77719535	0.771744514	0.62126795	0.798664657	0.632189026	0.28103021	-0.11936799	0.77002195	
	Signed Ranked	0.05682126	0.34388079	0.13362031	0.01507634	0.09176737	0.07504205	0.09434218	0.16581226	0.769112515	0.387595916	0.05092767	0.330612876	0.2597545	0.46907158	0.205712564	0.47879111	0.11570093	0.55289973	0.302763974	0.76612423	0.557841796	0.520596871	0.85076085	0.632194994	0.869480684	0.63822395	0.38871032	0.151357516	0.763173816	
	Profit of Short	0.02334016	0.0158485	0.0284384	0.01962678	0.01321502	0.02494420	0.01431261	0.021962349	0.02512502	0.02626187	0.02040194	0.00898772	0.01140816	0.01259532	0.01336654	0.019896685	0.02168806	0.03447194	0.02019407	0.030854294	0.02526201	0.016231287	0.02126384	0.03391941	0.02384964	0.01535247	0.009617348	0.03307535	0.01728775	
	T Stats	0.17025914	0.3640204	0.10811034	0.26017918	0.475414328	0.17478451	0.443149362	0.23048731	0.16762027	0.137615924	0.26585702	0.62274853	0.5201087	0.545951062	0.461828916	0.2612003	0.202089934	0.049132394	0.25005542	0.560764184	0.089694892	0.163769595	0.370944655	0.260796597	0.05784932	0.10884612	0.075784932	0.590456582	0.838366555	0.34362792
	Signed Ranked	0.05691327	0.18740308	0.05701916	0.15489045	0.238334971	0.12613752	0.31680542	0.153684025	0.118954529	0.07355998	0.13048677	0.36453997	0.320436461	0.31104009	0.27619556	0.10805058	0.08099291	0.02427894	0.07580571	0.324191832	0.0131678	0.02972278	0.08951956	0.09408869	0.00774086	0.02596714	0.01720632	0.22885705	0.43048066	0.05474609
	No. of long	24	19	15	16	17	15	17	15	17	24	26	17	11	11	11	10	10	25	17	15	11	10	10	10	6	6	6	16	11	10
	No. of short	24	19	15	16	17	17	15	17	25	26	17	13	11	11	10	9	9	25	17	15	11	10	9	9	5	5	6	16	11	10
	total no. of days (long)	90	97	97	94	96	97	97	97	97	97	97	91	95	95	97	91	91	92	91	91	93	96	99	94	88	87	88	87	91	93
	total no. of days (short)	171	164	165	167	166	164	164	162	161	167	165	170	166	166	164	168	170	170	169	170	168	165	162	167	173	174	173	174	176	168
	average no. of days (long)	3.75	5.10526159	6.4	5.875	5.58823294	5.70388263	6.46666667	5.823528412	4.16666667	3.61538415	5.64708824	7	8.636363636	8.636363636	8.818181818	9.3	9.1	9.1	3.69	5.35294176	6.2	8.727272727	9.9	9.4	14.66666667	14.5	14.66666667	5.4375		9.3
	average no. of days (short)	7.125	8.631578947	11	10.4375	9.764705882	9.764705882	10.93333333	9.529411765	6.4440	6.423076923	9.75088253	13.07692308	15.0930909	15.0930909	16.4	18.66666667	18.88888889	18.88888889	6.76	10	11.2	16.5	18	18.55555556	34.6	34.8	33.333333	10.875	15.45454545	18.66666667
2008	Profit of Long	0.04622192	0.06228882	0.03667824	0.03004072	-0.01033559	-0.01487701	-0.01145287	0.01487629	0.03443145	0.02079933	0.05973624	0.04067307	0.03024656	0.04808382	0.02032515	0.07550348	0.047481876	0.02471937	0.03645643	0.08063442	0.07785129	0.06014937	0.05051369	0.05672574	0.02189870	0.02194291	0.02570447	0.035096419	0.05581493	0.07424469
	T Stats	0.29309306	0.50045153	0.20951284	0.49554841	0.82598931	0.749647122	0.88057692	0.76697592	0.46369916	0.65501184	0.21213956	0.406761919	0.47138369	0.32706291	0.40402905	0.13530779	0.33270638	0.23671404	0.459713629	0.106634954	0.12586204	0.2477507	0.32815258	0.263405414	0.66620547	0.815012494	0.62203487	0.49401974	0.21256589	0.15960184
	Signed Ranked	0.10131032	0.26413173	0.10955721	0.19304026	0.74485443	0.69934984	0.80839764	0.407839874	0.24159194	0.25748748	0.03540434	0.17828701	0.11002542	0.15847636	0.17063747	0.17488425	0.175093467	0.15079679	0.10664876	0.05616764	0.08255454	0.05268033	0.06461624	0.06539749	0.270201592	0.30844675	0.27827525	0.193257925	0.02475831	0.04359549
	Profit of Short	0.04038562	0.00753282	0.03064442	0.02389749	0.04007074	0.01643859	0.02865674	-0.01117986	0.05123994	0.06770822	0.05545379	0.03194208	0.04067058	0.02795939	0.046556116	0.01340801	0.04415058	0.02041238	0.04249038	0.02594963	0.01059337	0.02344646	0.02120433	0.034875659	0.055316935	0.05514918	0.02738263	0.01723265	0.01389173	
	T Stats	0.2557293	0.85662384	0.04603688	0.49955762	0.40995374	0.64352478	0.43047698	0.76047938	0.668315159	0.09993136	0.122062749	0.59593240	0.16713611	0.46557599	0.320501572	0.70625715	0.23075121	0.57062625	0.20032407	0.38954554	0.46422282	0.336893497	0.29429139	0.08888251	0.15700687	0.425274462	0.37137307	0.09046708	0.1398173	
	Signed Ranked	0.20938603	0.48366808	0.33774691	0.361571305	0.211284312	0.659410816	0.404803026	0.982393157	0.4805476	0.109403547	0.13220849	0.22440084	0.120530913	0.382433471	0.357037693	0.376949241	0.21553072	0.555145454	0.156917713	0.324931283	0.69605250	0.661084641	0.51895149	0.222170794	0.12194883	0.145240746	0.47417369	0.127506029	0.17204408	0.237905322
	No. of long	18	13	12	13	13	14	15	16	13	15	12	9	8	8	8	8	8	14	10	7	6	6	5	5	5	12	7	4	4	
	No. of short	18	13	12	13	13	14	15	16	15	18	15	8	8	8	8	8	8	14	10	7	6	6	5	5	5	12	7	4	4	
	total no. of days (long)	128	124	125	127	125	127	128	123	118	118	115	115	113	117	118	121	120	117	118	114	114	115	114	115	114	112	112	114	117	114
	total no. of days (short)	128	125	124	122	124	122	128	126	131	131	134	134	136	132	131	128	129	132	136	135	134	135	134	135	137	137	135	132	133	135
	average no. of days (long)	6.72222222	5.58461538	10.41666667	9.769230769	9.615384615	9.074126571	8.533333333	7.6875	6.473684217	7.866666667	9.833333333	12.77777778	14.375	14.125	14.75	15.125	15	8.57142857	11.3	16.28571429	14.375	16.28571429	16.42857143	19	16.66666667	22.4	9.5	17.4126571	28.5	
	average no. of days (short)	7.11111111	9.615384615	10.33333333	9.384615385	9.584615385	9.384615385	8.64857143	8.4	7	8.733333333	10.16666667	14.88888889	16.75	17	16.5	16.375	16	16.125	9.428571429	13.6	19.28571429	16.75	19.28571429	19.14285714	22.5	22.83333333	24.4	11.25	18.85714286	33.75
2009	Profit of Long	-0.01136888	0.00328278	0.005528015	0.04129224	0.038322543	0.00808241	0.01363675	-0.01684733	0.01952865	0.000373402	0.006138049	0.007676801	0.00786723	0.00196671	0.0059818	0.00498449	0.004933525	0.013389513	0.026058823	0.02763055	0.00310595	0.011296876	0.039424597	-0.011223938	-0.023885404	-0.015534541	-0.00785482	0.038970496	0.02774198	0.01959887
	T Stats	0.75978567	0.96263091	0.87878424	0.913486854	0.83488995	0.82567494	0.70421562	0.62591612	0.5824775	0.99177777	0.88244118	0.83842186	0.847740619	0.95791535	0.89966605	0.9335804	0.8913769	0.76073295	0.4441303	0.51680245	0.14947672	0.29966204	0.7629049	0.527524211	0.67844844	0.83472268	0.27719513	0.76581857	0.60147764	
	Signed Ranked	0.72971462	0.94841995	0.87955123	0.916091239	0.81614328	0.51605412	0.44072126	0.7586123	0.62129674	0.80629414	0.54231375	0.81917754	0.79318242	0.75879533	0.94772032	0.841147653	0.90369094	0.30118844	0.53585859	0.61946872	0.58701141	0.738711806	0.79623719	0.64587658	0.63880446	0.190452915	0.67704136	0.49331752		
	Profit of Short	-0.01159238	-0.02168059	-0.01220244	0.0134554	0.01873695	0.01178915	-0.01379449	0.02408327	0.05031398	0.009813529	0.00392935	0.008736696	0.000327549	0.02531302	0.01571918	0.014504918	0.008217763	-0.00678128	-0.00617895	0.009511702	0.00328652	0.0223847	0.010227885	0.01936534	0.030203738	0.018944598	0.02464695	-0.00319196	0.01998025	0.01368241
	T Stats	0.72929235	0.50489265	0.70265387	0.665316994	0.542172259	0.709745259	0.667972249	0.4693866	0.08571375	0.00597866	0.90047176	0.80099468	0.91948071	0.41765874	0.80955304	0.64384801	0.79658724	0.83261568	0.85339874	0.76255754	0.35760693	0.49008166	0.69801717	0.53867049	0.32851068	0.54852467	0.62888327	0.952016319	0.53837603	0.67422773
	Signed Ranked	0.73631938	0.50095867	0.70265387	0.65458278	0.502076069	0.55340158	0.73742049	0.405851873	0.176554379	0.84895973	0.74599726	0.85180172	0.81481808	0.466068561	0.72281859	0.70648502	0.913063434	0.84442369	0.78723272	0.73158208	0.431523678	0.54680474	0.707509194	0.672493534	0.404576082	0.51784862	0.68147636	0.85468386	0.570650923	0.82826977
	No. of long	26	18	17	14	14	14	19	19	28	18	12	11	8	7	8	8	8	14	10	9	9	8	7	6	5	5	6	11	12	9
	No. of short	26	18	17	15	15	19	19	28	17	11	10	8	7	7	7	7	7	13	9	8	8	7	6	5	5	10	10	10	10	10
	total no. of days (long)	122	118	115	109	107	112	112	121	117	113	110	108	104																	

-0.00957679	-0.01017884	-0.01164347	-0.01499326	-0.02389834	-0.01104348	-0.0212442	-0.01057809	-0.01485401	-0.03641614	-0.03309698	-0.0350167	-0.02495872	-0.02798286	-0.02037536	-0.03468853	-0.03587082	-0.04684357	-0.03560915	-0.03659806	-0.03442152	-0.04476707	-0.04626176	-0.04369437	-0.03287278	-0.04610659	-0.04689774	-0.04091414	-0.03244079	-0.02509649	-0.02437841	-0.02070404	-0.02980223	
0.66377655	0.37664449	0.61081593	0.5099229	0.20691467	0.64884579	0.2607435	0.64367741	0.94957189	0.11801919	0.16081362	0.12814861	0.31318753	0.26598638	0.40776836	0.16429357	0.17484933	0.07788397	0.15847295	0.16969661	0.19626975	0.08579568	0.08732204	0.09754305	0.30812710	0.14425156	0.11622556	0.15007616	0.26203212	0.141489214	0.42879697	0.49578828	0.36951526	
0.714941825	0.41594447	0.62479578	0.49883226	0.24288564	0.73552086	0.371869543	0.94287241	0.20239911	0.29773404	0.25619684	0.39045428	0.30840614	0.59326706	0.27062553	0.28545628	0.116081656	0.20786071	0.2454915	0.27880244	0.16620228	0.14667994	0.16642888	0.391301262	0.257988244	0.231479544	0.28283906	0.142861224	0.51946889	0.565552812	0.651741117	0.592821145		
0.012725712	0.02808552	0.02267764	0.02980004	0.02800952	0.04522686	0.00973452	0.00978859	0.001033941	0.017513805	0.020305786	0.016060049	0.024319022	0.024416511	0.024696247	0.003589345	0.00693226	0.010468272	0.016258878	0.016344834	0.01887735	0.020200481	0.024043707	0.015764478	0.024766395	0.020695603	0.01817718	0.021130327	0.015639252	0.018423754	0.018817093	0.019154581	0.01980103	
0.34189708	0.23495906	0.21724549	0.09344835	0.11602247	0.157331962	0.575796461	0.583613568	0.558163346	0.320181405	0.246925387	0.346107073	0.159000075	0.15902007	0.1593968	0.830848328	0.676138288	0.527330337	0.340596009	0.323520015	0.253540524	0.222776392	0.21359798	0.341059543	0.112988904	0.187473445	0.250825008	0.185492691	0.243543535	0.233517383	0.22475849	0.20895568		
0.121335758	0.06806307	0.055692494	0.019494518	0.013885518	0.04544538	0.21159948	0.242481401	0.166961225	0.084172201	0.069075134	0.109196355	0.032907538	0.052029562	0.02753072	0.305949028	0.272722001	0.174132769	0.080555701	0.074946125	0.047433258	0.044038102	0.077456341	0.03539951	0.05401381	0.064579181	0.04106804	0.08052522	0.056033043	0.050591472	0.051756825	0.046484539		
6	7	6	6	6	5	12	10	8	6	5	4	4	4	4	9	6	6	6	5	4	3	3	3	6	4	3	4	3	3	3	3	3	
6	6	5	5	5	4	12	10	7	5	5	4	3	3	3	9	6	5	5	4	3	2	2	2	6	4	3	4	3	3	3	3	3	
91	91	91	90	87	85	84	83	86	85	85	81	80	77	79	62	63	64	67	64	63	62	60	62	43	45	44	45	46	45	45	44	44	
170	170	170	171	174	176	177	178	175	176	176	180	181	184	182	199	198	197	194	197	198	199	201	199	218	216	217	216	215	216	217	217	217	
13	13	15	16666667	15	14.5	17	7	8.3	10.75	14.16666667	14.16666667	16.2	20	19.25	19.75	6.88888889	10.5	10.66666667	11.16666667	12.8	15.75	20.66666667	20	20.66666667	7.16666667	11.25	15.33333333	15	15	14.66666667	14.66666667	14.66666667	
28.33333333	28.33333333	34	34.2	34.8	44	14.75	17.8	25	35.2	35.2	45	60.33333333	61.33333333	60.66666667	22.11111111	33	39.4	38.8	49.25	66	99.5	100.5	99.5	36.33333333	54	72.33333333	54	71.66666667	72	72	72.33333333	72.33333333	
0.035432214	0.045223004	0.035774444	0.046362381	0.049123305	0.03454645	0.026814444	0.082555901	0.065468823	0.051126785	0.055146438	0.058580066	0.046109422	0.041596691	0.01287866	0.063987039	0.074025411	0.066880315	0.059906148	0.059906148	0.062364761	0.052603622	0.034026717	0.047533165	0.048672999	0.049963812	0.049963812	0.047439324	0.061626495	0.061626495	0.041700384	0.041700384	0.049516754	
0.503815008	0.38832611	0.502748707	0.374911484	0.349484559	0.539645595	0.602480887	0.40877549	0.35831055	0.313118525	0.28189951	0.248729776	0.360399673	0.405212204	0.797432511	0.210239634	0.150066618	0.195483616	0.248811264	0.248811264	0.234328047	0.314313969	0.520748662	0.371844004	0.435248962	0.427777204	0.427777204	0.431546637	0.33562923	0.33562923	0.51829085	0.51829085	0.482805001	
0.19025792	0.129520329	0.266527958	0.17354354	0.154468466	0.213471748	0.042062341	0.065378625	0.141049993	0.111930248	0.087725958	0.130665318	0.180203817	0.410821786	0.078355702	0.02839944	0.050399462	0.084109225	0.084109225	0.057705914	0.082517812	0.222779833	0.119201684	0.085604392	0.083405168	0.102650288	0.065575873	0.065575873	0.158542644	0.158542644	0.135841176			
0.047345121	0.053801175	0.052290774	0.039383329	0.05594013	0.01801305	0.073413562	0.056028946	0.069335713	0.066246211	0.059824621	0.050897253	0.039385554	0.020840518	0.024001357	0.039162372	0.051125551	0.030159972	0.041598887	0.041598887	0.020686403	0.005624447	0.02525105	0.005480648	0.039383359	0.039276079	0.039276079	0.049607078	0.031753803	0.031753803	0.040435954	0.040435954	0.034218935	
0.10635861	0.097893921	0.08726938	0.211254039	0.25966770	0.572172125	0.019580554	0.07720465	0.122443507	0.0373891	0.05943352	0.102166215	0.22304516	0.376358118	0.02006988	0.25516801	0.109995855	0.34432629	0.18772693	0.18772693	0.40132493	0.836797986	0.68271434	0.85795725	0.138961616	0.137538366	0.137538366	0.05783436	0.22048832	0.22048832	0.106051083	0.106051083	0.17284246	
0.149771128	0.147365912	0.09675897	0.25574504	0.317436498	0.589368799	0.04217023	0.087832588	0.15130555	0.03743943	0.06328794	0.152410821	0.22175521	0.37405953	0.382551912	0.30384848	0.14002747	0.340189273	0.134715658	0.314779502	0.466054619	0.345259229	0.558881242	0.084384849	0.083467196	0.083467196	0.054814734	0.15963854	0.15963854	0.07756382	0.07756382	0.144535555		
5	5	4	4	11	4	4	4	6	6	5	5	4	4	4	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	
5	5	4	4	4	4	11	7	6	6	5	5	4	4	4	4	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	
114	113	115	115	114	115	119	120	121	121	119	119	120	119	120	121	117	117	117	117	118	116	114	101	100	100	100	100	100	100	100	100	100	101
135	136	134	134	135	134	130	125	128	128	130	130	129	130	129	128	132	132	132	132	132	131	133	135	148	148	148	148	148	148	148	148	148	148
22.8	22.6	28.5	28.5	28.5	28.5	28.75	10.81818182	17.14285714	20.16666667	23.8	23.8	30	29.75	30	15.125	29.25	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
27	27.2	38.5	33.5	33.5	33.5	11.81818182	18.42857143	21.33333333	21.33333333	23	26	32.25	32.5	32.25	16	33	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
0.01249328	0.00795248	-0.012477801	-0.021577906	0.010386766	0.00701843	0.01786804	0.015552152	0.003665171	0.005579287	-0.000602675	0.00624832	0.01438242	0.017772957	0.005495957	0.005625304	0.00423815	0.016503943	0.01851981	0.013547428	0.007853254	-0.001934016	-0.002186471	-0.002849577	0.020247452	0.003864855	0.00252682	0.003660051	0.000914945	0.017914585	0.04775945	0.003651188	-0.005501153	
0.79434077	0.82529862	0.73294615	0.79133854	0.856697638	0.62833131	0.698441714	0.83077812	0.98837665	0.79377302	0.83248374	0.77716231	0.66339763	0.81776832	0.69646208	0.936333987	0.76051191	0.72042179	0.799418839	0.885252454	0.995153779	0.94168632	0.958178206	0.715769204	0.94405302	0.95729341	0.947164639	0.98658782	0.741933254	0.93554807	0.947387987	0.92188942		
0.79864881	0.93496082	0.644990774	0.520733535	0.726375677	0.817816415	0.515962414	0.666041303	0.816726366	0.98332791	0.944826572	0.80296234	0.708130631	0.634552409	0.833422885	0.640927392	0.783267152	0.66789039	0.754959698	0.793206214	0.841920179	0.987116321	0.750796138	0.989454218	0.47015368	0.730784894	0.737858566	0.84983864	0.785698215	0.56128028	0.737858566	0.759061303	0.932798986	
0.012882454	-0.00282597	0.002481024	0.006576322	0.001527343	0.003245057	0.002164339	0.008523611	0.008451101	0.013927493	0.014427768	0.014105195	0.011070191	0.015044638	0.008255102	0.00171186	0.011038734	0.002616353	0.012328565	0.012049943	0.011652122	0.009944359	0.008652418	0.003411814	0.010128966	0.016888442	0.019389206	0.002948517	0.020486604	0.005953414	0.006508122	0.014868162	0.015043187	
0.68054725	0.934364215	0.935700652	0.858515454	0.95888662	0.762026168	0.67799992	0.779127834	0.775792319	0.642998468	0.633137623	0.633552161	0.710021927	0.611163275	0.784154542	0.659491987	0.676284303	0.05055624	0.645941798	0.648703032	0.668288228	0.705485425	0.741249824	0.721730439	0.684951146	0.504811345	0.446019612	0.407976737	0.402778313	0.814292211	0.79831862	0.557341951	0.547888212	
0.837144656	0.87371978	0.99373766	0.997294141	0.909713054	0.820246682	0.785008687	0.888665187	0.879685914	0.679085277	0.662902319	0.684925066	0.786803519	0.661062843	0.854075208	0.911703434	0.624854073	0.623643923	0.651983212	0.638364383	0.725239002	0.78508086	0.803591887	0.760777295	0.582423745	0.438461656	0							

Appendix 4

	TABLE 17			
	Summary of recent MAS policy decisions			
	Date	Mid-point change (centre)	Appreciation bias (slope)	Bandwidth (band)
1	27-Jul-00	No Change	Shift to gradual and modest appreciation	No Change
2	22-Feb-01	No Change	No change - Gradual and modest appreciation	No Change
3	12-Jul-01	No Change	Shift to zero percent appreciation	No Change
4	10-Oct-01	No Change	No change - Zero percent appreciation	Widened
5	2-Jan-02	No Change	No change - Zero percent appreciation	Restored/Narrowed
6	11-Jul-02	No Change	No change - Zero percent appreciation	No Change
7	2-Jan-03	No Change	No change - Zero percent appreciation	No Change
8	10-Jul-03	Re-centred (lower) at prevailing level	No change - Zero percent appreciation	No Change
9	10-Oct-03	No Change	No change - Zero percent appreciation	No Change
12	12-Apr-04	No Change	Shift to gradual and modest appreciation	No Change
13	11-Oct-04	No Change	No change - Gradual and modest appreciation	No Change
14	12-Apr-05	No Change	No change - Gradual and modest appreciation	No Change
15	11-Oct-05	No Change	No change - Gradual and modest appreciation	No Change
16	11-Apr-06	No Change	No change - Gradual and modest appreciation	No Change
17	10-Oct-06	No Change	No change - Gradual and modest appreciation	No Change
18	10-Apr-07	No Change	No change - Gradual and modest appreciation	No Change
19	10-Oct-07	No Change	Increased slightly the slope of the SGD NEER policy band	No Change
20	10-Apr-08	Re-centred (higher) at prevailing level	No change - Gradual and modest appreciation, with slightly higher slope	No Change
21	10-Oct-08	No Change	Shift to zero percent appreciation	No Change
22	14-Apr-09	Re-centred (lower) at prevailing level	No change - Zero percent appreciation	No Change
23	12-Oct-09	No Change	No change - Zero percent appreciation	No Change
24	14-Apr-10	Re-centred (higher) at prevailing level	Shift to gradual and modest appreciation	No Change
25	14-Oct-10	No Change	Increased slightly the slope of the SGD NEER policy band	Widened slightly

