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Portfolio Asset Allocation On a Sector Rotation Strategy Triggered by Fed's Discount Rate

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**Portfolio Asset Allocation on a Sector Rotation Strategy triggered by FEDs
Discount Rate**

By

Jorge L Orozco Gomez

An Abstract of a Project
In
Applied Economics

Submitted in Partial Fulfillment
of the Requirements
for the degree of

Master of Arts

May 2016

Buffalo State College
State University of New York
Department of Economics and Finance

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Can we outperform the market with lower exposure ...

A Project
In
Applied Economics

By

Jorge L. Orozco Gomez

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of the Requirements
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Masters of Art

May 2016

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Introduction

Portfolio managers are in constant investigation for investment strategies that allows them to obtain higher returns with a lower exposure to risks involving the market. It is a very hard task given the fact that no strategy is proven to be 100% effective. In fact, from my perspective no strategy will ever be accurate and profitable all the time, not only because it's basically impossible to predict the future, but because if such formula was ever found, everyone would apply it and therefore its attributes would be eradicated by all markets participant. Similar to all arbitrage opportunities that are eliminated by the same market participants when all of them apply the same position and move the market towards normality.

This said, I do believe in the rationality that some strategies perform better than others, and therefore good portfolio managers should be able to study, decide and implement the one they consider more precise and profitable. Certainly, in current times it is indispensable that these strategies are not only intended to make the most revenue, but also takes into consideration the risk factor, given the actual conditions where volatility and market instability are more common than previous years.

So, what are the determinants of a good model? Which are the steps we should follow to make assertive decision on a portfolio asset allocation?

Many studies and theories have been developed to answer these questions, each very different from one another, which widens our spectrum of possibilities and makes our task more complicated.

One of the main and most basic strategy suggests that investors should buy and hold assets as long as they consider and fulfil an investment horizon. This strategy has proven right in many cases, especially those where the chosen stock or asset obtains astronomical returns due to market conditions or innovations that make it a unique special case, something like winning the lottery. However, these are very specific cases where luck plays a very important part and no deep study is built-in. If all participants in the capital markets apply this type of strategy based on fundamental beliefs, the market would stay plain, there would be no dynamism because investors would only buy once and hold, and the expectation of gain would reside only in future dividends. Nevertheless, this type of strategy would basically eliminate market analysts, advisors and operators. Something that to my belief would set us back ages.

Most recent strategies consist on investing on indexes and other assets that gather a wider portion of the market into one unique asset. Specifically, is like investing on the benchmark, which is the performance of a wide or specific industry all added together, where returns will depend on the results of not only one unique stock but on the performance of all the same type of stocks added together. This seems to be a very reasonable and logical strategy, particularly because it diversifies risk and could represent a higher return if the whole economy executes well. But once again we observe a very simple strategy that when used by all markets participants will be discarded due to the lower returns that it implies.

This is why the need of further elaborated strategies are a must, and why the need for different strategies that seek higher returns with lower risk are necessary. We all want a dynamic and fair market that allow our savings to increase and that profits are

not only obtained by the company owners and wealthy families, but instead a market where everyone has access and the chance to improve their conditions.

The purpose of this project is to evaluate sector rotation strategies to determine if they out-perform market index strategies. This work will focus on the development of a portfolio strategy that will give portfolio managers and small investors the possibility to obtain higher returns with lower exposure. At the same time, it will give life to the market as it is a dynamic and vivid strategy.

The secret of a good investment decision doesn't only depend upon the numerical analysis elaborated but by the virtue or capability of the decision maker to make it at the correct moment in time. This is why this becomes one of the most important task, know when to move your pieces. Once you have decided when to move your pieces you have to know where to move them, it works just like a game of chess.

Throughout this financial experiment we will use an observable signal in the economy that will tell us exactly when to move, and an economic logic that will tell us where to do so. Based on economic theory and market historical behavior we are going to be able to demonstrate that an active strategy based on "when and where" will outperform most asset allocation strategies in the financial market.

Review of Literature

Monetary Policy

The Federal Reserve as the Nation's Central Bank is responsible for managing and controlling the amount of money and credit in the U.S. economy. A good administration of this task is vital in order to obtain the main goals of the Federal Reserve; promote maximum employment, stable prices and moderate long-term interest rates. Not an easy task for the biggest and most open market economy in the world.

To appropriately manage this economic issues, the Federal Reserve has the right to stablish monetary policies that could change according to the economic condition, but that work as a guideline to seek for FEDs main goals mentioned earlier.

We can understand Monetary Policy as a set of rules and conditions established by the FED that anticipates the countries general economic path. There are basically 3 ways the monetary policy can be directed; first, it could be an expansive monetary policy which means that they look forward to raising money supply and credit in the economy in order to boost the different industries. This way they can promote employment and general growth. Second, is the restrictive monetary policy, which essentially aims to reduce money supply and credit from the economy, this way they have control when prices are going up, widely known as inflation. Finally, they could take a less invasive monetary policy that allows markets to work more on their own, they mainly do this when things are going well.

It is important to know and understand the tools the FED uses to manage monetary policy. As you may know, this doesn't work as a law that once it is sign it is mandatory and everybody must follow. Instead it works like a set of rules that looks to achieve something specific, it could either have the desired impact in the economy or not. Additionally, there is no timing or exact result for that objective.

The three main tools or instruments used to manage monetary policy are open market operations, the discount rate and reserve requirements.

Open market operations

Open market operations are basically the buying and selling of government securities such as T-Bills, notes or Treasuries issued by the U.S Treasury, federal agencies and government-sponsored enterprises. These type of operations influence the supply of bank reserves. Here it's how it works, when the FED wants to increase reserves they buy securities and deposit money to the account maintained at the FED by the primary dealers' bank. So if banks now have a larger reserve they are going to be able to authorize more loans, which at the end represents opportunity for companies and people to obtain loans to grow, invest on their business or increase their expense. The previous allows the economy to move and become more dynamic, which could probably evolve to more job opportunities and growth, one of the most important goals of the FED.

Discount rate

We can understand the discount rate tool as the interest rate charged by the FED to depository institutions and commercial banks on short-term loans. It is important to explain that this rates are set by each Reserve Bank's board of directors, but under approval and supervision of the FED's board of governors. There are 3 different interest rates; the primary credit rate, the secondary credit rate and the seasonal credit rate. It depends on what type of institution you are, the term of the loan and the eligibility to determine which credit rate would apply to the different market participants.

It is clear to us that lowering discount rate by the FED is intended to raise the economic activity by injecting liquidity at a low price to commercial financial institution, and the opposite is pursuit when discount rate goes higher.

Reserve requirement

We can understand the reserve requirement as a percentage of deposits that banks must maintain on their account at the Federal Reserve Bank. It is a very simple tool to understand, when the FED raises the percentage of the reserve requirements, banks will have less money to throw into the economy through loans. When the

opposite happens, the FED lowers the reserve requirement, banks are allowed to assume more risk and inject money through loan in the economy.

Effects of lowering or rising discount rates in the economy

The discount rate has proved to be a powerful tool to the FED's principal objectives in the economy. In fact, the Federal Reserve has indicated that the discount policy is aimed at the achievement of a variety of goals, these include the financial goals of the system as well as broader goals of overall macroeconomic stabilization policy.¹

Numerous studies have evidence the usefulness of the discount rate as a tool to obtain certain results in the economy. Economist Richard Froyen was able to demonstrate the significance of discount rate policies toward balance of payment deficit, inflation rate and unemployment rate in the 70's.

Certainly the impact of discount rate changes goes far beyond the main economic variable and directly affect the financial goals, as mentioned earlier. As being a rate that basically sets the price of money in the economy, the discount rate has an outrageous impact not only in the economy but in particular in the financial system, particularly in the securities markets like bonds and stock.

Discount rate changes and security returns

Several paper from famous economist have tried to explain the close link between the capital markets and their reaction toward the Federal Reserve Policy, especially the effects of changes in the discount rate on the stock market. Most of them have come to the conclusion that markets are directly affected by expectations or changes on the FED's discount rate, hence it is vital for all markets participants to take into account this expectation as a key indicator for their investment strategy.

Important economists have even come with measurements of the impact of changes in discount changes in the capital markets, Bernanke and Kuttner, for example,

¹ Richard T. Froyen, "The Determinants of Federal Reserve Discount Rate Policy," *Southern Economic Journal* 42, no. 2 (Oct., 1975): 193-200.

stated that a hypothetical unanticipated 25-basis-points cut in the federal fund discount rate is associated with about a 1% increase in broad stock indexes.²

The question that raises then is, is the discount rate a monetary tool used to impact and changes general economic monetary conditions or has it become a capital markets oriented tool? Many economists agree that the most direct and immediate effect of the monetary policy actions, such as changes in the federal funds rate, are on the financial markets, not on macroeconomic variable as it is intended.³

Consequently, it is important for investment decision makers not only understand the impact of changes in discount rate by the FED, but to also have a clear notion of momentum in order to make the best decisions. First of all, they need to understand, and as previous findings have demonstrated, that discount rate increase are considered bad news, while rate decrease are associated with good news. In other words, “discount rate decreases serve as good news for the capital or stock market because they signal a less restrictive future FED monetary policy”.⁴

On the other side a discount rate increase may lead to a downturn on the stock market, not only because the use of money is going to cost more, as mentioned earlier, but because it is associated with a decrease in expected future dividends and rise in the future expected real interest rate used to discount those dividends.⁵

Evidence has proven that markets react strongly to unexpected discount rate changes. Studies that measure the impact and volatility of markets between the days of meeting of the Federal Open Market Committee and the days a discount rate change are prove of this.

² Ben S. Bernanke and Kenneth N. Kuttner, “What Explains the Stock Market Reaction to Federal Reserve Policy,” *The Journal of Finance* 60, no. 3 (June 2005): 1221-57

³ Ibid,1221

⁴ Gerald R Jensen and Robert R Johnson, “An Examination of Stock Prices Reaction to Discount Rate Changes under Alternative Monetary Policy Regimes,” *Quarterly Journal of Business and Economics* 32, no. 2 (Spring, 1993): 26-51.

⁵ Ben S. Bernanke and Kenneth N. Kuttner, “What Explains the Stock Market Reaction to Federal Reserve Policy,” *The Journal of Finance* 60, no. 3 (June 2005): 1221-57

This is known as the “announcement effect” associated with discount rate. According to Jensen and Johnson (1993), the preannouncement period includes the five trading days preceding the announcement, during this time movement of stock prices are consistent with the announcement period reaction. They suggest two main reasons for this behavior; first, discount rate changes often can be predicted by those who monitor money market conditions and Federal Reserve Policy, suggesting that if their expectations are set, they are most likely to move towards a strategy that goes along their prediction and as a general chain effect move the entire market. Second, the discount rate change may lag economic changes that already have occurred, still having an impact in the market but with less strength compare to other circumstances.⁶

This is why investors and portfolio managers should keep aware of this instance and should be capable of making decisions on their portfolio asset allocation. If they don't make wise and timely decisions, earned growth can be diminished and fund reputation can be compromised.⁷

With a clear understanding and use of this hypothesis money managers are going to be able to make better decision and therefore become more profitable.

A Different Perspective

Even though all intellectuals agree that Federal Reserve Policy is relevant to financial markets, some do not accept the premise of a direct link between monetary policy cycles and stock returns. This hypothesis makes questionable the implementation of a portfolio strategy based on a parameter like the discount rate.

Durham, for example, considers that previous studies that determine a persistent empirical relation between the discount rate and stock returns are questionable. He argues that the results obtained by most authors are sensitive to sample selection and he also considers that their research does not distinguish between anticipated and

⁶ Gerald R Jensen and Robert R Johnson, “An Examination of Stock Prices Reaction to Discount Rate Changes under Alternative Monetary Policy Regimes,” *Quarterly Journal of Business and Economics* 32, no. 2 (Spring, 1993): 26-51.

⁷ Ibid, 1222

unanticipated monetary policy decisions.⁸ These two factors are not taken into account and because of this, researchers have accommodated their data to obtain a desired result that ultimately fails to represent a real life situation.

Recent studies have adjusted their models to take into consideration essential factors, such as those suggested by Durham. The fundamental idea that old information does not move stock prices, but new information seems to affect equity returns has become the big challenge for portfolio managers. Even though Durham considers that portfolio managers are unlikely to profit from trading strategies based on past Federal Reserve Policy decisions.⁹

Industry Rotation Strategy

The first thing we need to do is understand what does industry rotation strategy stand for. Many authors go over this concept without taking a minute to do a brief

⁸ J. Benson Durham, "More On Monetary Policy and Stock Price Returns," *Financial Analysts Journal* 61, no. 4 (jul. - Aug., 2005): 83-90.

⁹ *Ibid.*, 89

explanation of what it consists of. It could be a little bit awkward to do so, because it is not a strategy invented by a particular academic and no specific literature exist for the topic. We will try to give a brief explanation based on the common understanding we have on the concept.

An industry rotation strategy is a widely applied strategy used by portfolio managers and mutual funds around the world. It primarily consists on the basic concept of shifting assets or securities from one industry to another. This means that portfolio managers will sell all their assets from one or a group of industries they were invested in and with those funds purchase assets or securities from another individual or group of industries that are quite different from the one he was invested in before.

Normally a manager who plays with this strategy needs a reason or a signal to change from one industry to another. This is one of the main attributes of this strategy, and at the same time one of the most challenging variables to identify and be accurate in. The most frequently used indicator variables can go from Federal Reserve rates to inflation to treasury bonds yields or dividends.¹⁰ This can be understood by a simple example; If in the treasury yield curve long term bonds have lower yield than short term, then the future expectations of interest are lower and this implies better economic conditions because there is confidence in the economy. This signals a good economic future performance and therefore rotating your portfolio assets to a more cyclical sensitive industry would turn in to a more profitable investment.

¹⁰ Ahmed Parvez, Larry J Lockwood, and Sudhir Nanda, "Multistyle Rotation Strategies," *Journal of Portfolio Management*(Spring 2002): 17-29.

Another important aspect of the rotation strategy is having a good notion of timing or momentum, knowing the perfect time to rotate your assets from one industry to another is a big task. Many author say it's very easy to do experimentations based on historical data, people can play with numbers and just switch from an industry to another at the best numerical moment. But in real life it is hard to do so because most of this decisions are made most of the time by expectations of something that is going to happen in the near future but is yet uncertain.

To sum up, the concept relies on changing your investment from one industry to another based on a clear signal that indicates it's time to change your asset allocation, plus trying to be as accurate as possible in timing. The theory states that a manager that is able to do these things on an accurate way will guarantee great performance and outrages returns.

Why is Industry Rotation a good strategy or method?

As mentioned earlier there are countless strategies or method used to allocate securities in a way that turns a portfolio into a money making portfolios or market outperformers. In this case we will focus on the industry rotation strategy, a strategy that has proven great result.

First of all, we can declare that one of the big benefits of the industry rotation strategy is the simplicity of the concept, the industry rotation strategy is very simple to understand. A person with a modest knowledge of the economy and markets is capable of implementing this strategy. No major numbers, formulas, software or models are used in this strategy.

Second, the strategy is known for its low cost. Depending on the signal variable the charges will vary, if for example your strategy is based on a monthly signal it is more than probable you have to reallocate assets every month. As a result of this, you would end up paying significantly more money in commission cost. However, if you choose a signal that is rarely changing and more stable the probabilities of having low cost is almost guaranteed.

Third, access to information: the model doesn't need nuclear science data. Most of the information needed to build the model is of public access and accessible on the web. This means that is not only cheap but that in fact you are able to have access to data on the variables that determine the model.¹¹

Finally, the results have demonstrated that a well implemented strategy outperforms the market and allows great returns. Additionally, the risk factor is lower, which means higher returns with less exposure, an ideal condition to all portfolio managers. Conover, Jensen and other CFAs simulated and back-traced a, what they called, "Sector Rotation strategy and Monetary Conditions", they went back 33 years of data and established parameters to emulate a sector rotation strategy. Their results were quite interesting

¹¹ C. Mitchell Conover, CFA et al., "Sector Rotation and Monetary Conditions," *Journal of Investing* 17, no. 1 (Spring 2008): 34-46.

Sector Rotation Results for Conover: Table 1

Portfolio	Mean	Standard Deviation	Return to Risk
<i>Time period</i>	<i>1973-2005</i>		
Sector Rotation	15.82%	15.50%	1.02
Benchmark	12.34%	14.79%	0.83
Market	12.04%	15.50%	0.78

As you may observe, the annualized mean return of the sector rotation portfolio had a greater return than the benchmark and the market itself. Their sector rotation strategy changes from what they called cyclical to non-cyclical stocks, triggered by the Federal Reserve policy: if the policy was restrictive they would allocate their assets in non-cyclical stocks; if the opposite happened and the FED was driving an expansive policy, they would allocate assets on cyclical stocks.

Additionally, you can observe the standard deviation was very close to each other, which allowed the sector rotation portfolio to obtain a higher return to risk with a 1.02. This implies better returns with almost the same exposure.

When evaluating a method, it is vital to not only list the good things but also the negative aspects that may come through. This is why we should really try to find out which are the weak aspects of the Industry Rotation Strategy.

One of the main questionable aspect of these strategies is the cost it may carry. As mentioned earlier, if your strategy is based on a daily, weekly or even monthly

signal, the cost of the strategy will be very high. The main reason is the cost of commissions; this will affect small investors or individuals who are not big players in the market. Commission charges to small players are very high, and therefore if you are shifting your asset allocation every day or week your profit will be absorbed by commission.

Another questionable aspect of the Industry Rotation Strategy is the inconsistency of giving a clear idea on when should the portfolio manager execute his move, this is not a logical or given aspect of the strategy. Many argue that this could lead to mistakes that could cost real money, as a move at the wrong time could represent millions of dollars.

To solve this last issue, analyst have set a time frame by which a portfolio manager should execute the strategy. This time frame may consist of previous days before information that triggers is released. The good thing is that predicting what the FED is going to do regarding interest rates has become a more transparent and predictable task.

US Industry

The United States is the largest economy in the world, with a GDP close to 18,000 Billion Dollars, and it has developed an economy very dynamic and with many

industries that participate within it. This opens the spectrum for investors and allows to have wider options of stocks in the different industries.¹²

The main industries can be listed as follows:

Figure 1

Agriculture, Forestry, Fishing and Hunting	Mining	Manufacturing	Educational Services
<ul style="list-style-type: none">•Farms•Forestry	<ul style="list-style-type: none">•Oil and Gas extraction•Mining, except oil and Gas•Support activities for Mining	<ul style="list-style-type: none">•Durable goods•Wood products•Nonmetallic mineral products•Machinery•Computer and Electronics•Motor Vehicles•Chemical Products•Plastic and Rubber	<ul style="list-style-type: none">•Hospitals•Social Assistance•Ambulatory Health Service

¹² “National Income and Product Account Gross Domestic Product: First Quarter 2016,” BEA-Bureau of Economic Analysis, April 28, 2016, accessed May 22, 2016, <http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>.

Finance and Insurance	Real Estate	Retail Trade	Transportation
<ul style="list-style-type: none"> • Insurance • Banks • Funds 	<ul style="list-style-type: none"> • Housing • Other Real Estate • Rental and Leasing 	<ul style="list-style-type: none"> • Motor Vehicles and Part Dealers • Food and Beverage Stores • General Merchandise Stores 	<ul style="list-style-type: none"> • Air transportation • Rail transportation • Water transportation • Truck transportation • Pipeline transportation

It's important to understand the concept of industry because when an investor has a clear knowledge of the different industries, their relevance, their impact and most important their performance, they are going to be able to make better decisions regarding where to invest their money at a certain point of time.

One of the most important things portfolio managers should be able to analyze is the behavior of different industries throughout economic cycles. If a portfolio manager is able to determine what industry is best for a certain economic cycle, he would be able to obtain better returns.

If for example the economy is struggling, rates are high, volatilities are high, and major stocks are going down, an investor should know that he should invest in an

economic sector that does not depend on the market's good performance. He should instead put his money on a more stable type of industry, that probably doesn't give him the best return but at least it does not represent losses.

A good way to join the concept of industry and economic cycle will be through the classification of cyclical and non-cyclical industries. Cyclical industries are those industries that are sensitive to the general economic cycle. This means, if the economy is performing well, the industry is also performing well. By good economic performance we mean growing GDP, low interest rates, low unemployment, stable inflation.

By non-cyclical industries, we refer to those industries that are very stable despite good or bad performance of the economy. The particularity of returns in these industries is that they are commonly very slow, stable, with lower but constant and easier to predict.

From Figure 1 below we can determine which are cyclical and non-cyclical industries. A clear example of a cyclical industry is the retail trade industry, which includes major players like the motor vehicles and parts dealers. When the economy is slowing down the first thing that people will stop doing is buying new cars, they will keep their actual car and wait until things get better to buy a new one. Due to this behavior the industry is highly affected because their sales are going down and their results and profits decrease as well. If a company has a bad quarter or yearly results it is more than probable that the stock price will diminish as well, and the investors will be affected because they will lose value in their portfolio. So, as you may see, due to a specific economic condition the industry would end up with a certain result. This is what makes

it cyclical. If on the other side the economy was performing well for the manufacturing industries, especially those players like durable goods, computers and electronics are going to obtain great results because consumer demand is raised during good conditions of the economy and good future expectations.

Some examples of non-cyclical industries would be hospital services, because despite economic conditions, people get sick or have accidents and therefore will always use hospitals. It is very hard to find a substitute to a hospital, and it's a matter of surviving to go to one when you are sick; this is what makes it so stable during the different periods of the economy. Food industry firms, especially in those particular industries that produce the basic family basket, are very stable too. We can't substitute basic meals that allow us to obtain our basic nutrients and energy; as a result, the demand for food will always exist regardless of the economic conditions and this is what makes it a non-cyclical industry.

Having a clear understanding of what an industry rotation strategy consists of and knowing the basic concepts and behaviors of the different industries in the economy, allows one to build up a strategy that has proven to be powerful.

Empirical Data

It is time now to go a little deeper on actual data that not only demonstrate the great results of an Industry rotation strategy but also shows the relation that exist within the variables immersed in the strategy. A great way to see these type of links is through

graphs, which help us visually observe the concepts and the straight link between the variables included in the model.

There are many ways to analyze the different components of the model, one of the most important concept we have discussed is the premise of the existence of a straight connection between the FED's monetary policy and stock market performance. We have mentioned several times that depending on the FED's decision regarding discount rate the market will go one way or the other.

Graph

To support this theory, we provide a graph that shows the market behavior on different scenarios monetary policy. We classify the FED's monetary policy in two different ways, expansive and restrictive. Expansive monetary policy consists of the FED's strategy to stimulate the economy in order to achieve growth, better employment conditions and dynamism in the different industries, and one of the tools they use is lowering the discount rate. Periods of continuous lowering of the discount rate are considered expansive, and the FED continuously raising the discount rate is classified as restrictive.

The second variable included in the graph has to do with stock market, one of the most significant indicators of the market performance is the Index behavior. In this case we will use the S&P 500 index, an index that gathers information from major companies and industries in the Unites States. We have collected data all the way back to 1973 to build up this graph on historical performance.

We want to do a parallel that marks down the different monetary policy cycles and the index behavior during a specific period of time. The idea is to closely determine the impact of monetary policy in the index direction. With this basic analysis we would demonstrate the existence of a connection between one and another.

As you may observe there is a direct link between the variables, when there is an expansive monetary policy the index goes up, which means gains value, and when the policy is restrictive it generally goes down. There are two clearly observable periods that demonstrate this premise, one, between 1996 and 1999 together with the period between 2008 and present days. Both have been expansive periods in which we can observe the index goes straight up, demonstrating the connection between these two variables. The period between 2000 and 2007 is very particular, because it is harder to observe the link between the two variables, despite this fact, if we analyze deeper we can observe that the link exists but there is a lag effect, which means, that the effects of discount rate or monetary policy is not evident immediately on the index result, but takes some time to react toward the new monetary policy. This is one of the challenges portfolio managers have to deal with, they need to be able to predict and find momentum on their investment, depending on economic variables and different situations within the economy things can take more or less time to show their effect.

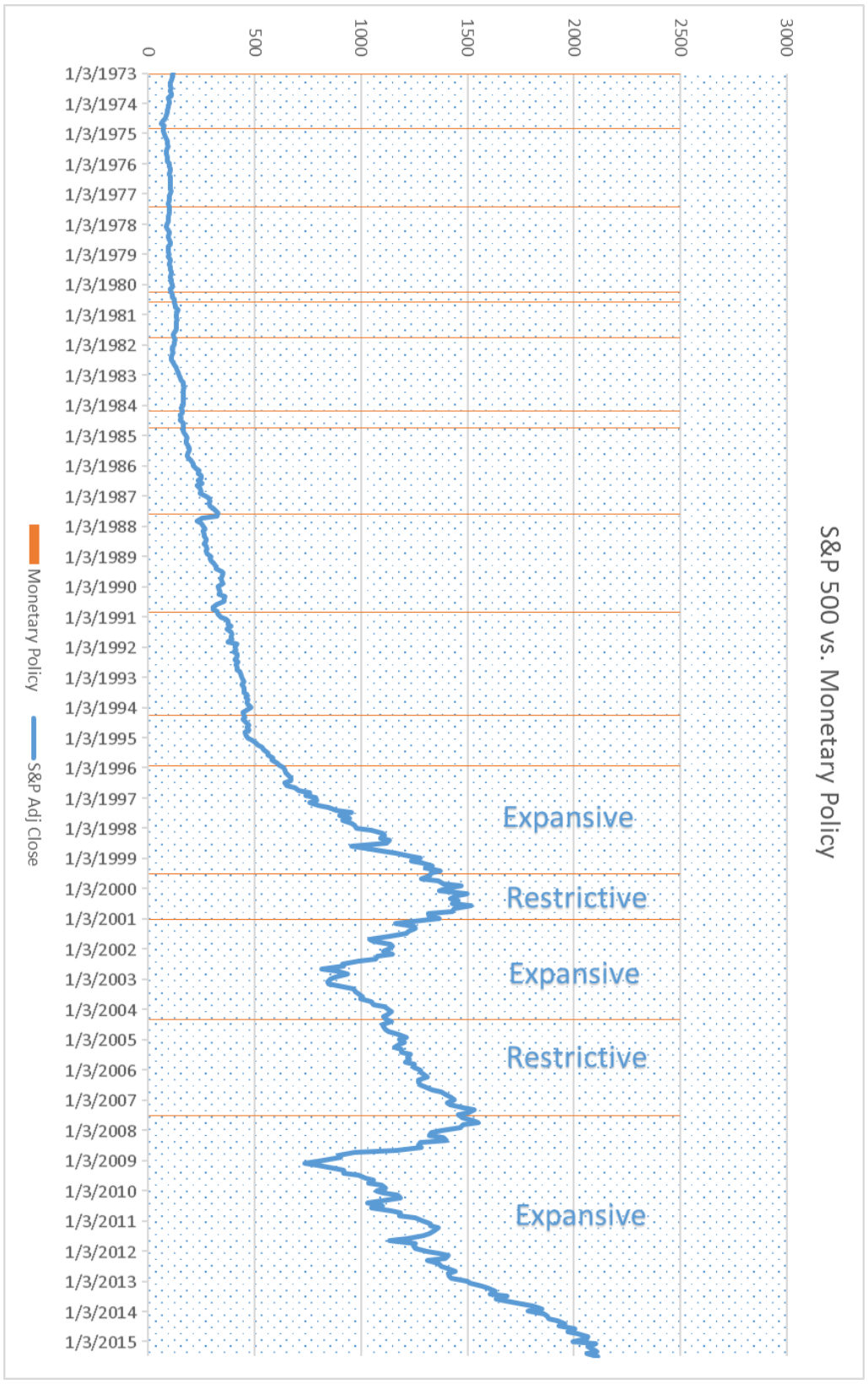


Figure 2

Model

The Trigger Variable

The model is going to be based on a trigger variable known as the FED's discount rate. As mentioned earlier this is the interest rate charged by the FED to depository institutions and commercial banks on short-term loans. The model will include basically two sets of data information, the first part of the model will be based on the FED's adjusted discount rate, which was published by the FED until January 2003. The second part of the model will be based on the FED's Primary credit rate.

The time frame used in the model will go from January 1973 up till July 2015. For academic purposes and data access we consider it is the appropriate fragment of historical data we should analyze. It is of public access to obtain this data and is published on the Federal Reserve web site.

The first thing we should do is obtain historical data on adjusted discount rate and from the Primary Credit Rate and join them together to complete a total time frame of the periods between January 1973 and July 2015. Once we have obtained the historical data we start categorizing the different periods into expansive monetary policy and restrictive monetary policy.

As we mentioned earlier the logic of this categorization will go as follows: during continuous lower rate decision by the FED, we will label the period as expansive. When

the opposite happens, and we observe continuous rate hikes, we will label that period as restrictive.

Table 2

Change rate date	Policy Period	DISCOUNT RATE
1973-01-15	Jan 1973-Nov 1974	5.00
1973-02-26		5.50
1973-05-04		5.75
1973-05-11	Restrictive	6.00
1973-06-11		6.50
1973-07-02		7.00
1973-08-14		7.50
1974-04-25		8.00

1974-12-09	Dic 1974-Sep 1977	7.75
1975-01-10		7.25
1975-02-05		6.75
1975-03-10	Expansive	6.25
1975-05-16		6.00
1976-01-16		5.50
1976-11-22		5.25
1977-08-30		5.75

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As you may observe the graph shows how to set up the data set and be able to classify the different periods into expansive or restrictive. We have replicated this analysis all the way to July 2015, which allows us to complete the first part of the model. The

¹³ See appendix B for complete data set

information has been collected on a monthly basis and the main reason to do so relies on the fact that it is a decent parameter to be able to link the discount rate and stock returns.

Industry Returns

The second part of the model consist on obtaining historical data on returns on the different U.S Industries. Given the complexity of obtaining this kind of information, we have analyzed the effectiveness of using a data set given by famous economist French and Fama. They have developed a historical portfolio of the different industries in the United States and are able to provide researchers with historical monthly returns on does industries.

French and Fama developed a 49 industry portfolio that value-weights returns of all CRSP firms incorporated in the US and listed on the NYSE, AMEX or NASDAQ.¹⁴ The importance on this data set of historical monthly return for the major industries in the United States, is that it will allow us to evidence the correlation between stock returns and monetary policy and therefore we will be able to apply what we have denominated the Industry Rotation Strategy.

Our historical returns will be given by month and by industry, the data set will basically tell us the story and therefore we will be able to address when returns behaved on a positive way and when the performance of the different sector was negative.

¹⁴ Keneth R. French, "Current Research Returns," Keneth R. French, accessed May 30, 2016, <http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/index.html>.

Table 3

PORTFOLIO PERIOD	Agric	Food	Soda	Beer	Smoke
Jan-73	-0.97%	-3.24%	-2.20%	-5.25%	0.16%
Feb-73	-1.93%	-3.93%	-3.70%	1.93%	-1.13%
Mar-73	-3.05%	-2.01%	0.35%	0.78%	0.59%
Apr-73	-8.05%	-5.19%	-1.93%	-5.09%	-8.91%
May-73	-7.90%	-1.19%	-0.12%	-0.53%	-1.92%
Jun-73	5.67%	-6.43%	1.48%	-1.14%	3.62%
Jul-73	17.48%	7.34%	3.19%	5.38%	5.36%
Aug-73	2.74%	-1.54%	-2.91%	-1.61%	-7.35%
Sep-73	12.43%	7.60%	5.17%	-0.77%	1.40%
Oct-73	-3.81%	-2.23%	-2.72%	1.60%	-0.45%
Nov-73	-16.06%	-12.12%	-12.34%	-13.86%	-7.94%
Dec-73	3.79%	-0.66%	-2.67%	1.99%	2.35%
Jan-74	2.29%	6.15%	-5.40%	-0.83%	3.01%
Feb-74	13.82%	1.40%	-2.36%	-1.74%	1.85%
Mar-74	-1.57%	-1.56%	-4.06%	-2.20%	-6.00%
Apr-74	-9.26%	-2.65%	-4.15%	-3.66%	-2.77%
May-74	-7.03%	-4.88%	-1.15%	-4.48%	5.59%
Jun-74	-11.85%	-0.92%	2.60%	-3.24%	-0.50%
Jul-74	-0.44%	-9.28%	-20.02%	-11.31%	-6.75%
Aug-74	-2.37%	-10.35%	-14.19%	-17.77%	-2.89%
Sep-74	-9.15%	-7.19%	-26.26%	-16.73%	-12.15%
Oct-74	20.23%	19.23%	23.72%	9.69%	22.54%
Nov-74	-2.23%	-0.71%	-11.10%	-4.04%	0.87%

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As you may observe the information is organized in a clear way, you are able to see monthly returns by the industry.

The idea is now to link or joint together the Feds Monetary Policy data set with the different industries monthly returns. This is a simple task, we have developed a

¹⁵ See appendix B for complete data set

basic excel spread sheet that will help us arrange all the information in order to later on, be able to play with the numbers and evaluate the efficacy of the strategy.

The spreadsheet will look like this:

Table 4

Change rate date	Policy Period	DISCOUNT RATE	PORTFOLIO PERIOD	Agric	Food	Soda	Beer		
1973-01-15	Jan 1973-Nov 1974	5.00	Jan-73	-0.97%	-3.24%	-2.20%	-5.25%		
1973-02-26		5.50	Feb-73	-1.93%	-3.93%	-3.70%	1.93%		
1973-05-04		5.75	Mar-73	-3.05%	-2.01%	0.35%	0.78%		
1973-05-11	<i>Restrictive</i>	6.00	Apr-73	-8.05%	-5.19%	-1.93%	-5.09%		
1973-06-11		6.50	May-73	-7.90%	-1.19%	-0.12%	-0.53%		
1973-07-02		7.00	Jun-73	5.67%	-6.43%	1.48%	-1.14%		
1973-08-14		7.50	Jul-73	17.48%	7.34%	3.19%	5.38%		
1974-04-25		8.00	Aug-73	2.74%	-1.54%	-2.91%	-1.61%		
			Sep-73	12.43%	7.60%	5.17%	-0.77%		
			Oct-73	-3.81%	-2.23%	-2.72%	1.60%		
			Nov-73	-16.06%	-12.12%	-12.34%	-13.86%		
			Dec-73	3.79%	-0.66%	-2.67%	1.99%		
			Jan-74	2.29%	6.15%	-5.40%	-0.83%		
			Feb-74	13.82%	1.40%	-2.36%	-1.74%		
			Mar-74	-1.57%	-1.56%	-4.06%	-2.20%		
			Apr-74	-9.26%	-2.65%	-4.15%	-3.66%		
			May-74	-7.03%	-4.88%	-1.15%	-4.48%		
			Jun-74	-11.85%	-0.92%	2.60%	-3.24%		
			Jul-74	-0.44%	-9.28%	-20.02%	-11.31%		
			Aug-74	-2.37%	-10.35%	-14.19%	-17.77%		
			Sep-74	-9.15%	-7.19%	-26.26%	-16.73%		
			Oct-74	20.23%	19.23%	23.72%	9.69%		
			Nov-74	-2.23%	-0.71%	-11.10%	-4.04%		
			TOTAL RETURN						
1974-12-09	Dic 1974-Sep 1977	7.75	Dec-74	-8.74%	1.43%	-0.34%	-7.66%		
1975-01-10		7.25	Jan-75	9.25%	17.85%	26.20%	26.09%		
1975-02-05		6.75	Feb-75	2.31%	4.27%	6.12%	10.93%		
1975-03-10	<i>Expansive</i>	6.25	Mar-75	-0.22%	2.71%	14.26%	4.92%		
1975-05-16		6.00	Apr-75	6.57%	0.30%	3.81%	-3.60%		
1976-01-16		5.50	May-75	2.37%	6.09%	9.10%	4.96%		
1976-11-22		5.25	Jun-75	8.97%	6.93%	0.54%	3.52%		
1977-08-30		5.75	Jul-75	-3.61%	-4.07%	-9.53%	-4.47%		
			Aug-75	-9.33%	-0.90%	-4.25%	-4.63%		
			Sep-75	-4.74%	-1.67%	-5.77%	-5.70%		
			Oct-75	11.86%	12.82%	15.55%	0.85%		
			Nov-75	-2.43%	2.31%	6.94%	2.57%		
			Dec-75	-1.91%	-1.49%	-4.15%	0.45%		
			Jan-76	10.17%	6.26%	12.11%	15.93%		
			Feb-76	-0.63%	-3.16%	-5.97%	1.66%		

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¹⁶ See appendix B for complete data set

This is just a small fraction of the whole spread sheet, remember that we are covering a time period between 1973 and 2015 and additionally we have monthly returns for 49 different industries.

Now we have been able to gather all the historical data to build up our model, information is organized on a strategic way on a spread sheet and know is a matter to transform data in order to be able to develop the model calculations.

Total Returns

Now that we have been able to adjust data and obtain all the information needed, we have to play with the number in order to adjust the information and be able to make the model flow.

Since we have been able to categorize the information and we have delimited certain period's characteristics on the historical data, we need to do some calculations regarding those periods in order to make comparisons and prove the strategy. Industry monthly returns is just the beginning information that we want in order to calculate total returns of the different Monetary Policy periods.

What we want to do is be able to calculate periods total returns for all the industries. To do so we will use the following formula, known as the geometric average return for a specific period of time:

$$\text{Geometric Average Return} = \sqrt[n]{(1 + R_1) * (1 + R_2) * (1 + R_3) * (1 + R_4)} - 1$$

$R = \text{Period Return}$

$n = \text{number of periods}$

This formula will allow us to obtain the total returns for each different monetary policy period on our spread sheet. The way we will implement this calculation on our spread sheet will be through a Visual Basic programming that will do automatization of the calculation for the 49 different industries and the whole period of 504 months.

The code we will use in our Visual Basics will be the following:

```
Function Totaltreturn(rngRange As Range) As Double
    Dim vbCell As Range
    Totaltreturn = 1
    For Each vbCell In rngRange
        Totaltreturn = Totaltreturn * (vbCell.Value / 100 + 1)
    Next vbCell
    Totaltreturn = (Totaltreturn - 1) * 100
End Function
```

Implementing this code in Visual basic will allow us to create a function that will calculate geometric total returns for the whole spread sheet and additionally it will permit to set up the information the way we want. Now the model information has been set up and transform in a way that is practical and useful to execute the model.

Table 5

PERIOD	Column1	DISCOUNT RATE	PORTFOLIO PERIOD	Agric	Food	Soda
1973-01-15	Jan 1973-Nov 1974	5.00	Jan-73	0.990	0.968	0.978
1973-02-26		5.50	Feb-73	0.981	0.961	0.963
1973-05-04		5.75	Mar-73	0.970	0.980	1.004
1973-05-11		6.00	Apr-73	0.920	0.948	0.981
1973-06-11		6.50	May-73	0.921	0.988	0.999
1973-07-02		7.00	Jun-73	1.057	0.936	1.015
1973-08-14		7.50	Jul-73	1.175	1.073	1.032
1974-04-25		8.00	Aug-73	1.027	0.985	0.971
			Sep-73	1.124	1.076	1.052
			Oct-73	0.962	0.978	0.973
			Nov-73	0.839	0.879	0.877
			Dec-73	1.038	0.993	0.973
			Jan-74	1.023	1.062	0.946
			Feb-74	1.138	1.014	0.976
			Mar-74	0.984	0.984	0.959
			Apr-74	0.907	0.974	0.959
			May-74	0.930	0.951	0.989
			Jun-74	0.882	0.991	1.026
			Jul-74	0.996	0.907	0.800
			Aug-74	0.976	0.897	0.858
			Sep-74	0.909	0.928	0.737
			Oct-74	1.202	1.192	1.237
			Nov-74	0.978	0.993	0.889
TOTAL RETURN				-0.72%	-1.71%	-3.97%

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The spread sheet above shows how we are able to find total returns for the different expansive and restrictive monetary periods.

¹⁷ See appendix B for complete data set

Classifying industries in Cyclical and Non-Cyclical

Once we have all the information assembled we have the task of determining how to classify the industries in our portfolio. As we mentioned and explained earlier the Industry Rotation Strategy consist of moving from cyclical to non-cyclical industries depending on the monetary policy applied by the FED.

Since we are using the 49 industry portfolio provided by French, we need to synthetize the information to be able to do a good analysis and not just do experimentation with thousands of scenarios that at the end will give us uncomprehensive and not useful results.

To be able to do our analysis we have followed the cyclical and non-cyclical industry concept. We narrowed down our 49 industries into 6 main industries. Three of these industries, given their characteristics, are going to be grouped as cyclical and the other three are going to be grouped as non-cyclical.

We have decided that the industries of Utilities, Food and Smoke are going to be classified as Non-cyclical. Historically utilities have been a very stable non-cyclical type of industry. Many would think that due to its straight relation with energy consumption it will be a bad performer during recessions, but the truth of the matter is that this industry benefits from lower commodity prices during slow periods and stable consumption at a fixed price of the different households and companies.

The food industry has been a very steady industry and even though it has struggled during some periods of time, the key factor of its performance has no direct

correlation with economic conditions within the markets. All human beings will demand food even if the whole world is falling apart.

The third industry is the smoke industry. This is a very particular industry given the fact that many would think that it is a cyclical industry due to the price of cigarettes. The truth is that this industry has demonstrated a very stable market behavior during substantially good economic cycles as well as during hard economic recessions. The logic I can find behind all of this is that during good times people have more money to smoke and party, and during recessions the stress factor makes people buy more cigarettes to control their nerves. Sounds pretty silly, but it is reality.

On the other side we have decided to choose clothes, meals, fun and beer as our cyclical industries. The concept behind this decision relies on the fact these are industries that during complex economic periods normally perform poorly. People can stop buying new clothes and use their old clothes to save money; at the same time, people will stop going out to restaurants to eat prepared food and instead cook in their houses to save some dollars.

Once we have made this classification we can say that we have all the components of our model. The idea is to use all this information to seek a specific result that will evidence the benefits of implementing an industry rotation strategy.

Hypothesis

The Industry rotation strategy is a model that will allow portfolio managers to obtain higher returns with lower exposure. Given the change of direction of monetary policy by the FED, investors will allocate resources in cyclical or non-cyclical industries.

To be more specific, when the behavior of the discount rate evidences a restrictive policy, the portfolio manager will invest all of his resources in non-cyclical industries. When the opposite happens and the discount rate evidences expansive policy the investor will then sell all its non-cyclical assets and buy the cyclical industry stock to allocate all his resources. Doing this technique during a determined time horizon, switching from cyclical to non-cyclical when the monetary policy changes, the portfolio manager will outperform most strategies and with less exposure.

Results

In our excel spreadsheet we executed the Industry Rotation Strategy Portfolio and we were able to obtain very interesting results. The way we would go through these results will be the following: first we will show results regarding the parameter on classifying expansive and restrictive periods; second, we will analyze and show results on the annualized mean return and standard deviation for the seven industries we selected; third, we would analyze results regarding the industry performance by monetary policy cycle; and finally we conclude with a comparison between the portfolio-benchmark-market.

The Parameter: Table 6

Monetary Policy	Beginning Date	Beginning Rate	# of Changes
Restrictive	Jan-73	5%	8
Expansive	Dec-74	7.75	8
Restrictive	Oct-77	6%	13
Expansive	May-80	12%	3
Restrictive	Sep-80	11%	4
Expansive	Nov-81	13%	9
Restrictive	Apr-84	9%	1
Expansive	Nov-84	8.50%	7
Restrictive	Sep-87	6%	3
Expansive	Dec-90	6.50%	7
Restrictive	May-94	3.50%	4
Expansive	Jan-96	5%	3
Restrictive	Aug-99	4.75%	5
Expansive	Jan-01	5.75%	15
Restrictive	Jun-04	2.01%	41
Expansive	Nov-07	5%	95

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The monetary policy graph gives of important information to take into consideration for the understanding of the results. During the period analyze we had a

¹⁸ See appendix B for complete data set

total of 8 restrictive periods and 8 expansive periods, additionally we can observe that during the 511-month analysis we executed, 70% of the time the American economy was under expansive monetary policy and 30% of the time it was under restrictive monetary policy. The range between the rate fluctuated was a max rate of 14% and a minimum of 0.75%. A total of 226 rate changes were done during this period.

Annualized Mean Return and Standard Deviation: Table 7

Industry Return Characteristics: 1973 through 2015		
Industry	Mean Return	Standard Deviation
Utilities	10.18%	14.18%
Food	12.82%	15.87%
Smoke	15.03%	21.97%
Construction	8.18%	25.30%
Cloth	11.32%	23.40%
Meals	10.32%	21.06%
Fun	11.36%	26.97%
Beer	11.94%	18.71%

Annualized mean returns were calculated for the 7 selected industries, the result reflects our expectations, showing very similar returns within the different industries but a higher risk factor on the cyclical industries. Construction, Cloth and fun were significantly high compare to the rest of the industry on their standard deviation.

¹⁹ See appendix B for complete data set

Industry Performance by Monetary Cycle: Table 8

Industry Performance by Monetary Policy		
	Expansive Periods	Restrictive Periods
<i>Non-Cyclical</i>	Mean Returns	Mean Returns
Utilities	11.76%	6.41%
Food	14.80%	8.11%
Smoke	15.37%	14.21%
AVERAGE		
<i>Cyclicals</i>	Mean Returns	Mean Returns
Cloth	18.23%	-4.99%
Meals	17.11%	-5.73%
Fun	16.49%	-0.80%
Beer	13.52%	8.08%
AVERAGE		

²⁰

We were able to separate the monetary policy cycles and calculate the annualized mean returns for the different industries within them. The results are clear and validate our hypothesis; During Expansive Monetary periods returns on cyclical stocks will be higher than returns on non-cyclical stocks, additionally during Restrictive monetary policy periods returns will be higher on non-cyclical stocks. This been said, we execute our portfolio strategy, which once again, consist on changing from cyclical to non-cyclical industries depending on the monetary policy we are at.

Industry Rotation Strategy Vs. Benchmark and Market Porfolio: Table 9

²⁰ See appendix B for complete data set

Industry Rotation vs Benchmark and Market Portfolio		
	Mean Returns	Standard Deviation
Industry Rotation	13.44%	15.13%
Benchmark	11.86%	15.66%
Market	10.58%	16.01%

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The strategy behind this model allows us to switch from one group of industries to another to benefit from the best results of both worlds. The outcomes are clear and can be interpreted as follows; The industry rotation strategy is able to outperform returns compare to the benchmark and the market. With a 13.44% annualized return the strategy beat the benchmark by more than one percentage point and the market by almost two percentage point. Regarding the risk factor, the industry portfolio was able to reduce volatility and therefore obtain a lower standard deviation of 53 basis point compare to the benchmark. At a first glimpse we can evidence that the hypothesis is backed up by the results.

Sharpe Ratio

One of the most commonly used indicator of portfolio performance is the Sharpe Ratio. This indicator allow us to compare returns from different portfolios taking into consideration a risk measurement. The Sharpe Ratio divides the average portfolio

²¹ See appendix B for complete data set

excess return over the sample period over the standard deviation of returns over the period, it measures the reward to volatility.

The formula used in our calculations is the following:

$$\frac{(\bar{r}_p - \bar{r}_f)}{\sigma_p}$$

$\bar{r}_p = \textit{Portfolio annualized return}$

$\bar{r}_f = \textit{Risk Free annualized return}$

$\sigma_p = \textit{Portfolio's standard deviation}$

We calculated the annualized return of investing on a risk free asset, in this particular case we used the 10 Year Treasury Bills return for the period between January 1973 and July 2015, which is the same period evaluated in our portfolios.

Table 10

Sharpe ratio Industry Rotation		
Portfolio mean return		13.44%
Risk free return		9.68%
Portfolio standard deviation		15.13%
Sharpe ratio		24.9%
Sharpe ratio Benchmark		
Portfolio mean return		11.86%
Risk free return		9.68%
Portfolio standard deviation		15.66%
Sharpe ratio		13.9%
Sharpe ratio Market (S&P)		
Portfolio mean return		10.58%
Risk free return		9.68%
Portfolio standard deviation		16.01%
Sharpe ratio		5.6%

As you may observe the Sharpe ratio of the Industry Rotation Portfolio strategy has a higher Sharpe Ratio than the other two portfolios. This suggests that the reward toward risk is better in the Industry Rotation Portfolio than in the others because its returns are high and at the same time the exposure is low. This was evident in this case. Some other cases it is not as clear depending on the variations of returns and standard deviations of the different portfolios structures.

Interpretation

It is evident that the strategy works and results were as expected. The model was able to obtain better returns than the market and the benchmark assuming less risk. Our interpretation of this model or strategy allows us to confirm that a portfolio manager that works with discipline on his strategy will be able to replicate greater returns on real life situations. The key of success in this model is to be very strict on following the parameters, which means, execute the rotation when the signal is given. The second main task is work hard and do deep research on the different industries and stocks, this way you will be able to determine which will throw better results on your model.

Unfortunately, we also have to analyze the negative interpretations of the model. The weak part of the model relies on the cost of implementing the strategy. On our strategy we assumed a 0.01% commission per trade and we linked this to the model, the results show a total commission expense that almost vanished our additional return over the market index and the benchmark. This will question the efficiency of the effort put into the model and the benefits of implementing the strategy, due to the fact that why should we waste so much energy in a strategy that gives us almost the same returns as investing on an index.

The good thing is that every mind is a different world, and a portfolio manager can be clever enough to go through this cost limitation and benefit from the great logic and returns of the Industry Rotation Strategy.

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Appendices

Appendix A

PERIOD		DISCOUNT RATE	PORTFOLIO PERIOD	Agric	Food	Soda	Beer	Smoke	Toys	Fun
1973-01-15	Jan 1973- Nov 1974	5.00	Jan-73	0.990	0.968	0.978	0.948	1.002	0.852	0.892
1973-02-26		5.50	Feb-73	0.981	0.961	0.963	1.019	0.989	0.868	0.905
1973-05-04		5.75	Mar-73	0.970	0.980	1.004	1.008	1.006	0.957	0.957
1973-05-11		6.00	Apr-73	0.920	0.948	0.981	0.949	0.911	0.898	0.932
1973-06-11		6.50	May-73	0.921	0.988	0.999	0.995	0.981	0.937	0.942
1973-07-02		7.00	Jun-73	1.057	0.936	1.015	0.989	1.036	0.914	0.883
1973-08-14		7.50	Jul-73	1.175	1.073	1.032	1.054	1.054	1.171	1.137
1974-04-25		8.00	Aug-73	1.027	0.985	0.971	0.984	0.927	0.994	0.964
			Sep-73	1.124	1.076	1.052	0.992	1.014	1.117	0.957
			Oct-73	0.962	0.978	0.973	1.016	0.996	0.932	0.922
			Nov-73	0.839	0.879	0.877	0.861	0.921	0.772	0.693
			Dec-73	1.038	0.993	0.973	1.020	1.024	0.937	1.011
			Jan-74	1.023	1.062	0.946	0.992	1.030	1.090	1.086
			Feb-74	1.138	1.014	0.976	0.983	1.019	0.974	0.997
			Mar-74	0.984	0.984	0.959	0.978	0.940	1.052	1.036
			Apr-74	0.907	0.974	0.959	0.963	0.972	0.925	0.920
			May-74	0.930	0.951	0.989	0.955	1.056	1.024	0.991
			Jun-74	0.882	0.991	1.026	0.968	0.995	0.918	0.974
			Jul-74	0.996	0.907	0.800	0.887	0.933	0.871	0.870

			Aug-74	0.976	0.897	0.858	0.822	0.971	1.018	0.943
			Sep-74	0.909	0.928	0.737	0.833	0.879	0.816	0.767
			Oct-74	1.202	1.192	1.237	1.097	1.225	1.090	1.098
			Nov-74	0.978	0.993	0.889	0.960	1.009	0.960	0.977
			TOTAL RETURN	- 0.72%	- 1.71%	- 3.97%	- 3.39%	-0.71%	- 4.46%	- 5.49%
1974- 12-09	Dic 1974- Sep 1977	7.75	Dec-74	0.913	1.014	0.997	0.923	1.020	0.838	0.994
1975- 01-10		7.25	Jan-75	1.093	1.179	1.262	1.261	1.052	1.269	1.362
1975- 02-05		6.75	Feb-75	1.023	1.043	1.061	1.109	0.966	1.058	1.222
1975- 03-10		6.25	Mar-75	0.998	1.027	1.143	1.049	1.059	1.133	1.167
1975- 05-16		6.00	Apr-75	1.066	1.003	1.038	0.964	1.051	1.104	1.062
1976- 01-16		5.50	May-75	1.024	1.061	1.091	1.050	1.018	1.002	1.067
1976- 11-22		5.25	Jun-75	1.090	1.069	1.005	1.035	1.048	1.045	1.070
1977- 08-30		5.75	Jul-75	0.964	0.959	0.905	0.955	0.934	0.936	0.930
			Aug-75	0.907	0.991	0.958	0.954	0.954	0.956	0.998
			Sep-75	0.953	0.983	0.942	0.943	1.015	0.947	1.004
			Oct-75	1.119	1.128	1.156	1.009	1.063	0.991	1.020
			Nov-75	0.976	1.023	1.069	1.026	1.059	1.065	1.010
			Dec-75	0.981	0.985	0.959	1.005	0.997	0.971	0.969
			Jan-76	1.102	1.063	1.121	1.159	1.075	1.230	1.183
			Feb-76	0.994	0.968	0.940	1.017	0.989	1.058	1.003

			Mar-76	0.985	0.998	1.036	1.003	1.008	0.980	1.011
			Apr-76	0.988	1.002	0.959	0.957	0.986	1.038	0.930
			May-76	0.951	1.002	0.989	0.946	0.977	1.007	0.963
			Jun-76	1.023	1.061	1.041	1.058	0.973	1.039	1.055
			Jul-76	1.023	1.015	1.038	0.996	1.027	1.014	0.903
			Aug-76	0.960	0.997	0.997	0.990	1.039	0.946	0.990
			Sep-76	1.020	1.003	1.005	0.978	1.066	0.998	0.998
			Oct-76	1.003	0.984	0.960	0.972	1.002	0.963	1.027
			Nov-76	1.031	1.024	0.979	0.918	1.024	1.002	0.979
			Dec-76	1.095	1.049	1.007	1.093	1.040	1.098	1.154
			Jan-77	0.965	0.960	0.946	0.879	0.951	0.933	0.964
			Feb-77	1.059	0.981	1.017	1.010	0.996	0.950	0.949
			Mar-77	0.955	0.989	0.997	0.966	0.972	1.003	0.990
			Apr-77	1.006	1.010	0.968	0.982	1.021	0.953	1.010
			May-77	1.051	0.996	0.980	0.976	1.013	0.937	1.020
			Jun-77	0.990	1.046	1.039	1.016	1.024	1.041	1.112
			Jul-77	0.992	1.019	1.046	0.962	1.019	1.029	0.969
			Aug-77	0.981	0.990	1.027	1.017	1.024	0.972	1.026
			Sep-77	0.959	1.004	1.011	1.014	0.990	0.981	0.980
			TOTAL RETURN	0.56%	1.75%	1.79%	0.33%	1.26%	1.11%	2.83%
1977- 10-26	Oct 1977- Apr 1980	6.00	Oct-77	0.963	0.950	0.968	0.957	0.977	0.902	0.971
1978- 01-09		6.50	Nov-77	1.071	1.032	1.032	1.054	1.027	1.069	1.116

1978-05-11		7.00	Dec-77	1.037	0.996	1.006	0.975	0.982	0.991	1.032
1978-07-03		7.25	Jan-78	0.945	0.947	0.954	0.996	0.938	0.969	0.898
1978-08-21		7.75	Feb-78	1.006	1.003	0.992	1.001	1.007	0.991	0.997
1978-09-22		8.00	Mar-78	1.090	1.011	1.064	1.031	1.040	1.084	1.097
1978-10-16		8.50	Apr-78	1.019	1.050	1.105	1.043	1.086	1.088	1.146
1978-11-01		9.50	May-78	1.143	1.038	1.048	1.050	1.026	1.069	1.074
1979-07-20		10.00	Jun-78	0.983	1.017	0.981	0.984	1.000	0.978	1.001
1979-08-17		10.50	Jul-78	1.022	1.023	1.025	1.060	1.045	1.069	1.075
1979-09-19		11.00	Aug-78	1.054	1.034	1.041	0.997	1.013	1.031	1.089
1979-10-08		12.00	Sep-78	1.009	1.000	0.972	1.014	1.021	0.975	0.949
1980-02-15		13.00	Oct-78	0.787	0.900	0.903	0.853	0.918	0.828	0.813
			Nov-78	1.101	1.004	1.029	1.045	1.026	1.007	1.114
			Dec-78	1.015	1.006	1.039	1.034	1.025	0.993	1.038
			Jan-79	1.053	1.042	1.000	1.066	1.005	1.062	1.050
			Feb-79	0.957	0.960	0.959	0.961	0.970	0.927	0.942
			Mar-79	1.070	1.024	1.019	1.080	1.052	1.080	1.069
			Apr-79	1.057	1.002	0.972	1.022	0.998	1.072	0.997
			May-79	1.003	0.985	0.986	0.953	0.972	1.003	0.963
			Jun-79	1.065	1.034	1.023	1.061	1.055	1.034	1.015
			Jul-79	1.008	1.007	1.014	1.008	1.048	1.014	1.058

			Aug-79	1.062	1.077	1.042	1.117	1.087	1.092	1.039
			Sep-79	0.985	0.989	0.963	0.990	0.950	1.014	1.026
			Oct-79	0.908	0.922	0.903	0.904	0.962	0.903	0.916
			Nov-79	1.140	1.050	1.033	1.079	1.066	1.024	1.104
			Dec-79	1.083	1.023	1.007	1.042	1.031	1.046	1.109
			Jan-80	1.003	1.036	1.016	1.110	0.994	1.107	1.043
			Feb-80	1.020	0.948	0.913	0.977	0.952	0.978	0.957
			Mar-80	0.788	0.901	0.995	0.866	0.993	0.884	0.930
			Apr-80	1.058	1.089	1.036	1.043	1.096	0.961	1.090
			TOTAL RETURN	1.29%	0.21%	0.02%	1.01%	1.07%	0.55%	2.02%
1980- 05-29	May 1980- Aug 1980	12.00	May-80	1.072	1.087	1.054	1.098	1.090	1.059	1.041
1980- 06-13		11.00	Jun-80	1.073	1.030	0.983	1.037	1.057	1.027	0.989
1980- 07-28		10.00	Jul-80	1.094	1.032	1.113	1.090	1.073	1.122	1.064
			Aug-80	1.102	1.003	0.984	1.013	0.992	1.075	1.016
			TOTAL RETURN	8.49%	3.77%	3.21%	5.88%	5.23%	7.01%	2.69%
1980- 09-26	Sept 1980- Oct 1981	11.00	Sep-80	1.020	1.003	0.955	1.011	0.984	1.072	1.012
1980- 11-17		12.00	Oct-80	1.061	0.991	0.966	1.005	1.039	1.036	0.981
1980- 12-05		13.00	Nov-80	1.127	0.986	1.004	1.002	1.024	1.146	1.195

1981-05-05		14.00	Dec-80	0.941	1.022	1.082	0.959	1.008	0.915	0.997
			Jan-81	1.029	1.015	1.046	1.046	0.989	0.916	0.986
			Feb-81	0.941	1.012	1.070	1.032	1.033	1.008	1.054
			Mar-81	1.041	1.082	1.041	1.080	1.054	1.125	1.141
			Apr-81	1.045	1.004	0.981	0.980	1.010	1.045	1.007
			May-81	1.045	1.014	1.061	1.013	1.019	1.059	1.062
			Jun-81	0.995	0.993	0.983	1.006	1.013	0.906	0.951
			Jul-81	0.998	0.994	0.976	0.989	1.022	0.930	0.929
			Aug-81	0.939	0.946	0.964	0.943	0.943	0.973	0.921
			Sep-81	0.974	0.967	1.013	0.994	1.002	0.977	0.980
			Oct-81	1.066	1.081	1.115	1.083	1.059	1.112	1.116
			TOTAL RETURN	1.45%	0.73%	1.72%	0.93%	1.39%	1.26%	2.09%
1981-11-02	Nov 1981-Mar 1984	13.00	Nov-81	1.039	1.020	1.007	1.034	1.038	0.964	1.032
1981-12-04		12.00	Dec-81	1.019	1.015	0.971	0.979	0.941	0.995	0.979
1982-07-20		11.50	Jan-82	0.923	1.007	0.978	1.018	1.007	0.999	1.070
1982-08-02		11.00	Feb-82	0.964	1.018	0.932	0.985	0.963	0.913	0.955
1982-08-16		10.50	Mar-82	0.944	1.021	1.080	1.047	1.037	1.060	1.049
1982-08-27		10.00	Apr-82	1.100	1.064	1.059	1.099	1.071	1.079	1.020
1982-10-12		9.50	May-82	0.944	0.973	0.988	0.975	0.953	0.937	0.956

1982-11-22		9.00	Jun-82	0.966	1.019	1.035	1.022	1.027	0.988	1.035
1982-12-14		8.50	Jul-82	0.945	0.996	1.045	1.087	0.945	1.042	0.962
			Aug-82	1.008	1.072	1.081	1.041	1.135	1.075	1.000
			Sep-82	1.077	1.024	1.060	1.062	1.044	1.004	0.997
			Oct-82	1.109	1.089	1.016	1.070	1.122	1.193	1.209
			Nov-82	1.047	1.038	1.067	1.071	0.980	1.117	1.057
			Dec-82	1.035	1.018	0.990	0.961	0.996	0.914	0.831
			Jan-83	1.009	1.001	0.970	1.017	0.986	1.099	1.011
			Feb-83	1.078	1.010	1.003	1.047	1.020	1.128	1.068
		1.00	Mar-83	1.038	1.053	1.069	1.112	1.057	0.908	1.007
			Apr-83	0.970	1.061	1.042	1.054	1.045	1.036	1.067
			May-83	1.031	1.003	0.957	0.967	0.951	1.095	1.047
			Jun-83	1.007	1.021	0.990	1.000	0.996	1.115	1.003
			Jul-83	1.060	0.979	0.945	0.996	1.012	0.980	0.901
			Aug-83	0.972	1.011	1.058	1.032	1.057	1.002	0.961
			Sep-83	1.008	1.066	1.021	1.047	1.085	1.023	1.025
			Oct-83	0.956	1.042	1.027	0.973	1.027	0.947	0.967
			Nov-83	1.047	1.021	1.072	0.965	1.008	1.045	1.000
			Dec-83	1.011	1.003	0.990	0.973	1.034	0.992	1.068
			Jan-84	1.027	1.028	0.966	0.984	1.049	0.924	1.015
			Feb-84	0.933	0.946	1.005	0.926	0.923	0.939	0.910
			Mar-84	1.037	1.002	1.059	0.985	0.982	1.022	1.101
			TOTAL RETURN	0.91%	2.10%	1.57%	1.71%	1.57%	1.58%	0.81%

1984-04-09	Apr 1984-oct 1984	9.00	Apr-84	0.963	1.001	1.016	0.995	0.986	1.044	0.948
			May-84	0.956	0.973	1.001	0.997	0.992	0.904	0.979
			Jun-84	1.028	1.073	1.055	1.008	1.067	0.990	1.016
			Jul-84	0.993	0.974	1.032	0.971	1.004	1.021	0.951
			Aug-84	1.109	1.090	1.025	1.059	1.098	1.169	1.066
			Sep-84	0.963	1.030	1.034	1.010	1.040	0.911	1.012
			Oct-84	0.983	1.013	1.033	1.047	1.032	0.978	0.982
			TOTAL RETURN	- 0.21%	2.13%	2.79%	1.22%	3.07%	- 0.10%	- 0.75%
1984-11-21	Nov 1984-Aug 1987	8.50	Nov-84	1.047	1.005	0.968	0.999	1.017	0.932	0.999
1984-12-24		8.00	Dec-84	1.086	1.029	1.007	1.016	1.017	1.033	0.999
1985-05-20		7.50	Jan-85	1.029	1.017	0.979	1.053	1.024	1.106	1.163
1986-03-07		7.00	Feb-85	1.059	1.057	1.071	1.014	1.098	0.990	1.058
1986-04-21		6.50	Mar-85	1.009	1.056	1.116	1.043	1.031	0.978	1.029
1986-07-11		6.00	Apr-85	1.054	0.978	0.982	1.015	0.918	0.950	1.020
1986-08-21		5.50	May-85	1.037	1.153	1.032	1.085	1.000	1.078	1.049
			Jun-85	0.985	1.033	1.039	1.037	1.028	1.020	1.103
			Jul-85	1.038	0.955	1.005	1.012	0.948	1.010	0.985
			Aug-85	0.980	1.038	1.006	1.023	0.977	1.000	1.054

			Sep-85	0.915	1.074	0.998	0.993	0.941	0.947	0.980
			Oct-85	1.030	1.040	1.040	1.056	0.986	0.959	1.084
			Nov-85	1.045	1.093	1.134	1.024	1.100	1.105	1.045
			Dec-85	1.092	1.021	1.031	1.121	1.098	1.059	1.041
			Jan-86	1.079	1.024	0.988	0.991	1.056	1.021	1.039
			Feb-86	1.140	1.079	1.117	1.077	1.122	1.107	1.083
			Mar-86	1.027	1.079	1.109	1.092	1.115	1.057	1.069
			Apr-86	1.052	0.994	1.044	0.971	1.036	1.039	1.084
			May-86	1.011	1.086	1.080	1.064	1.102	1.032	1.059
			Jun-86	1.088	1.070	1.057	1.088	1.095	0.935	1.080
			Jul-86	0.872	0.963	0.930	0.970	0.973	0.930	0.849
			Aug-86	1.018	1.035	1.013	0.986	1.045	1.081	0.981
			Sep-86	0.916	0.882	0.866	0.919	0.888	0.903	0.902
			Oct-86	0.976	1.128	1.078	1.076	1.108	1.008	1.100
			Nov-86	1.004	1.006	1.005	1.008	0.999	1.003	0.953
			Dec-86	0.964	0.959	1.000	0.977	0.976	0.923	0.966
			Jan-87	1.082	1.116	1.151	1.220	1.214	1.201	1.193
			Feb-87	1.077	1.042	1.046	1.034	0.972	1.092	1.092
			Mar-87	1.024	1.022	1.024	1.009	1.008	1.048	1.009
			Apr-87	0.979	0.946	0.932	1.042	0.971	1.058	1.012
			May-87	0.994	1.039	1.032	0.955	1.012	0.967	1.014
			Jun-87	1.046	1.077	1.048	1.021	1.058	0.993	1.086
			Jul-87	0.967	1.019	1.062	1.084	1.093	1.044	1.069
			Aug-87	1.024	1.025	1.049	1.021	1.186	1.088	1.039
			TOTAL RETURN	2.04%	3.20%	2.88%	3.07%	3.31%	1.84%	3.57%

1987-09-04	Sept 1987- Nov 1990	6.00	Sep-87	1.000	0.964	0.985	1.007	1.003	0.981	0.978
1988-08-09		6.50	Oct-87	0.712	0.821	0.840	0.819	0.782	0.656	0.681
1989-02-24		7.00	Nov-87	0.972	0.918	0.921	0.952	0.918	0.887	0.937
			Dec-87	1.066	1.075	1.052	1.127	1.043	1.169	1.116
			Jan-88	1.033	1.041	1.021	0.997	1.030	0.937	1.021
			Feb-88	1.014	1.054	1.016	1.055	1.061	1.102	1.104
			Mar-88	1.046	0.990	1.000	1.006	0.966	0.983	0.961
			Apr-88	0.953	1.010	0.999	0.977	0.999	1.041	1.021
			May-88	0.989	1.006	1.005	0.977	0.962	1.005	0.985
			Jun-88	1.129	0.994	1.040	1.089	1.020	1.116	1.066
			Jul-88	0.969	1.034	0.964	0.971	1.066	0.976	1.002
			Aug-88	0.999	1.009	0.943	1.013	0.999	0.938	0.969
			Sep-88	1.027	1.056	1.016	1.101	1.083	1.050	1.024
			Oct-88	1.008	1.196	1.032	1.004	1.004	1.001	1.025
			Nov-88	0.992	0.995	1.003	1.000	1.018	0.963	0.955
			Dec-88	1.064	1.026	1.099	1.006	1.084	1.050	1.053
			Jan-89	1.032	1.053	1.064	1.052	1.051	1.100	1.088
			Feb-89	0.994	0.977	0.964	1.001	0.993	1.043	1.004
			Mar-89	1.034	1.043	1.035	1.078	1.102	1.073	1.077
			Apr-89	1.048	1.054	1.010	1.069	1.050	1.049	1.083
			May-89	1.026	1.050	1.049	1.089	1.075	1.076	1.057
			Jun-89	0.981	1.026	0.950	0.986	1.003	1.078	1.034
			Jul-89	1.170	1.129	1.036	1.167	1.143	1.099	1.083

			Aug-89	0.953	0.955	0.938	0.958	1.026	0.991	1.031
			Sep-89	0.994	0.991	1.032	1.015	1.008	1.002	1.028
			Oct-89	0.901	0.973	0.913	1.017	1.020	0.969	0.981
			Nov-89	1.043	1.037	0.993	1.038	0.997	0.993	1.024
			Dec-89	1.013	1.036	1.015	1.016	0.995	0.992	0.913
			Jan-90	0.886	0.899	0.894	0.910	0.914	0.886	0.893
			Feb-90	1.094	0.992	0.991	1.005	0.974	1.006	1.018
			Mar-90	1.027	1.053	1.099	1.062	1.068	1.068	1.011
			Apr-90	0.980	1.000	0.953	1.023	1.048	0.941	1.011
			May-90	1.014	1.092	1.084	1.159	1.011	1.124	1.132
			Jun-90	0.939	1.027	1.001	1.010	1.091	0.958	0.963
			Jul-90	1.066	1.004	1.014	1.000	1.056	0.910	0.922
			Aug-90	0.906	0.930	0.895	0.951	0.969	0.852	0.847
			Sep-90	0.867	0.989	0.897	0.934	1.009	0.914	0.964
			Oct-90	0.971	1.032	1.048	1.075	1.064	0.986	0.987
			Nov-90	1.081	1.052	1.097	1.052	1.079	1.097	1.123
			TOTAL RETURN	- 0.33%	1.30%	- 0.43%	1.75%	1.81%	- 0.31%	0.07%
1990- 12-19	Dic 1990- Apr 1994	6.50	Dec-90	0.980	1.049	1.028	1.024	1.054	1.022	1.029
1991- 02-01		6.00	Jan-91	1.070	1.031	1.056	1.047	1.027	1.119	1.050
1991- 04-30		5.50	Feb-91	1.104	1.120	1.075	1.108	1.077	1.175	1.102
1991- 09-13		5.00	Mar-91	1.024	1.061	1.059	1.057	1.014	1.044	0.977

1991-11-06		4.50	Apr-91	0.993	0.992	0.981	0.960	0.965	1.029	0.964
1991-12-20		3.50	May-91	1.108	1.027	1.031	1.039	1.039	1.041	1.039
1992-07-02		3.00	Jun-91	0.948	0.959	0.935	0.943	0.936	0.946	0.958
			Jul-91	1.053	1.056	0.963	1.091	1.074	1.007	1.049
			Aug-91	1.060	1.064	0.993	1.060	1.072	1.015	0.995
			Sep-91	0.955	0.967	0.916	0.954	0.978	1.085	0.984
			Oct-91	0.984	0.988	0.996	1.021	0.934	1.116	1.014
			Nov-91	0.956	0.999	0.979	1.030	0.967	1.016	0.915
			Dec-91	1.087	1.154	1.126	1.154	1.144	1.122	1.072
			Jan-92	1.008	0.943	1.015	0.969	0.951	1.011	1.139
			Feb-92	0.967	0.992	1.023	1.015	1.004	1.064	1.112
			Mar-92	0.973	0.971	0.967	1.014	0.956	0.973	0.988
			Apr-92	0.961	0.987	0.987	1.019	1.077	1.011	0.974
			May-92	1.033	1.009	0.977	1.036	1.004	1.065	1.013
			Jun-92	1.006	1.000	0.975	0.945	0.902	0.981	0.961
			Jul-92	0.997	1.057	1.000	1.046	1.046	1.024	1.016
			Aug-92	1.003	1.021	0.926	1.013	0.998	0.961	0.981
			Sep-92	0.966	1.029	1.046	0.979	1.014	1.064	1.055
			Oct-92	0.975	0.973	0.975	1.020	0.958	1.017	1.049
			Nov-92	1.032	1.037	1.075	1.007	1.020	1.055	1.082
			Dec-92	1.064	0.989	1.016	1.029	0.972	0.959	1.041
			Jan-93	1.019	0.967	0.985	1.009	0.943	1.054	1.064
			Feb-93	0.986	0.978	1.069	0.977	0.968	0.903	0.966
			Mar-93	1.013	0.974	1.086	1.025	0.991	1.026	1.043

			Apr-93	0.960	0.876	0.884	0.908	0.842	1.013	0.964
			May-93	1.024	1.026	1.048	1.032	1.048	1.074	1.118
			Jun-93	1.000	0.981	1.006	1.020	0.997	1.036	0.975
			Jul-93	1.012	0.948	1.079	1.000	0.954	1.011	0.979
			Aug-93	1.049	1.054	1.155	1.022	0.987	1.079	1.072
			Sep-93	1.005	0.978	0.915	0.985	0.962	1.033	1.074
			Oct-93	0.987	1.093	0.993	1.021	1.097	1.017	1.031
			Nov-93	0.986	1.009	0.976	0.996	1.058	0.999	0.965
			Dec-93	1.060	0.993	1.112	1.042	0.991	0.930	1.019
			Jan-94	1.052	1.015	1.043	0.951	1.101	1.020	1.048
			Feb-94	1.026	0.974	1.034	1.016	0.929	1.057	0.981
			Mar-94	0.921	0.962	0.892	0.968	0.890	0.936	0.905
			Apr-94	0.984	1.010	1.022	1.018	1.113	1.001	0.966
			TOTAL RETURN	0.86%	0.64%	0.84%	1.28%	-0.08%	2.57%	1.63%
1994-05-17	May 1994- Dic 1995	3.50	May-94	0.992	0.994	0.983	0.978	0.932	1.006	1.017
1994-08-16		4.00	Jun-94	0.961	1.014	0.942	0.954	1.031	0.944	0.961
1994-11-15		4.75	Jul-94	1.005	1.026	1.006	1.055	1.055	1.015	1.024
1995-02-01		5.25	Aug-94	1.049	1.082	0.922	1.052	1.098	1.042	1.036
			Sep-94	0.973	1.004	0.985	1.025	0.972	0.984	0.960
			Oct-94	0.976	1.023	1.049	1.037	0.976	1.062	0.987
			Nov-94	0.977	0.980	0.966	1.009	0.980	0.922	1.006
			Dec-94	1.003	1.016	1.016	1.019	0.980	0.953	1.049

			Jan-95	1.079	1.021	1.061	1.028	1.046	1.001	1.079
			Feb-95	0.949	1.015	1.052	1.049	0.988	1.043	1.039
			Mar-95	1.062	1.035	1.018	1.024	1.059	1.020	1.046
			Apr-95	1.043	1.038	1.025	1.032	0.957	0.950	1.034
			May-95	1.020	1.034	0.973	1.084	1.039	1.061	1.014
			Jun-95	1.048	1.026	1.038	0.999	0.991	1.018	1.006
			Jul-95	1.034	0.993	0.991	1.024	0.965	1.047	1.042
			Aug-95	1.032	1.012	1.057	0.984	1.046	1.009	0.994
			Sep-95	1.079	1.081	1.054	1.093	1.029	0.970	0.988
			Oct-95	1.030	0.997	1.052	1.039	1.028	0.942	0.979
			Nov-95	1.057	1.038	1.062	1.049	1.029	1.044	1.013
			Dec-95	1.026	1.036	0.981	0.992	1.050	1.000	0.975
			TOTAL RETURN	1.89%	2.29%	1.07%	2.57%	1.16%	0.06%	1.20%
1996- 01-31	Jan 1996- Jul 1999	5.00	Jan-96	0.989	1.038	0.975	1.033	1.018	1.083	1.031
1998- 10-15		4.75	Feb-96	1.085	1.012	1.055	1.056	1.032	1.015	1.019
1998- 11-17		4.50	Mar-96	0.986	0.958	1.074	1.019	0.923	0.996	1.018
			Apr-96	1.060	0.994	0.990	0.991	0.984	1.008	1.031
			May-96	0.981	1.059	1.049	1.097	1.055	1.041	1.022
			Jun-96	0.995	1.025	1.040	1.065	1.037	0.983	0.970
			Jul-96	0.951	0.977	0.979	0.942	1.002	0.893	0.877
			Aug-96	1.031	0.989	1.095	1.021	0.868	1.019	0.996
			Sep-96	1.042	1.091	1.090	1.007	1.014	1.070	1.076

			Oct-96	1.059	1.026	0.975	1.008	1.033	0.996	0.977
			Nov-96	1.012	1.062	1.031	1.027	1.107	1.065	1.091
			Dec-96	1.004	0.974	1.047	1.005	1.093	0.922	0.942
			Jan-97	1.048	1.024	1.112	1.114	1.046	1.029	1.039
			Feb-97	1.006	1.027	1.070	1.027	1.125	0.998	0.997
			Mar-97	0.942	0.993	0.961	0.935	0.865	0.989	0.959
			Apr-97	1.066	1.033	1.017	1.114	1.032	1.041	1.022
			May-97	1.050	1.023	1.054	1.064	1.100	1.062	1.053
			Jun-97	1.090	1.064	1.066	1.001	1.027	1.056	0.995
			Jul-97	0.981	1.050	1.268	1.019	1.013	1.036	1.014
			Aug-97	1.084	0.954	0.909	0.874	0.970	0.964	0.978
			Sep-97	1.069	1.067	1.010	1.081	0.972	1.019	1.058
			Oct-97	0.980	0.983	1.022	0.941	0.958	1.051	0.986
			Nov-97	1.066	1.076	1.069	1.073	1.087	1.007	1.091
			Dec-97	1.022	1.027	1.128	1.042	1.054	0.942	1.043
			Jan-98	0.937	0.968	0.912	0.980	0.927	1.047	1.067
			Feb-98	1.148	1.037	1.045	1.047	1.045	1.069	1.056
			Mar-98	0.994	1.042	1.103	1.125	0.967	0.970	1.001
			Apr-98	1.056	0.957	1.023	0.969	0.892	0.979	1.106
			May-98	1.053	1.007	1.016	1.029	1.006	0.976	0.928
			Jun-98	1.053	0.989	1.047	1.067	1.055	1.043	0.962
			Jul-98	0.862	0.933	0.864	0.955	1.104	0.902	0.990
			Aug-98	0.977	0.917	0.741	0.802	0.948	0.840	0.768
			Sep-98	0.915	1.055	1.045	0.950	1.125	0.926	0.997
			Oct-98	0.978	1.084	1.383	1.158	1.108	1.180	1.051
			Nov-98	1.072	1.041	1.050	1.058	1.092	1.007	1.148

			Dec-98	0.928	0.987	0.981	0.997	0.970	0.826	0.993
			Jan-99	1.024	0.960	0.943	0.984	0.878	1.010	1.092
			Feb-99	0.885	0.972	0.897	0.987	0.840	1.050	1.051
			Mar-99	1.289	0.951	0.964	0.984	0.911	1.022	0.941
			Apr-99	1.026	1.002	1.101	1.050	1.001	1.133	1.037
			May-99	0.988	1.042	1.045	0.994	1.100	0.951	0.944
			Jun-99	1.027	1.016	0.869	0.957	1.049	0.986	1.065
			Jul-99	0.972	0.957	0.999	1.003	0.931	0.934	0.934
			TOTAL RETURN	1.57%	0.93%	2.09%	1.29%	0.55%	0.07%	0.74%
1999- 08-24	Ago 1999- Dic 2000	4.75	Aug-99	0.974	0.981	0.932	0.962	1.006	0.921	0.990
1999- 11-16		5.00	Sep-99	1.008	0.959	0.836	0.851	0.931	0.934	0.974
2000- 02-02		5.25	Oct-99	0.964	1.090	1.079	1.164	0.751	0.886	1.030
2000- 03-21		5.50	Nov-99	0.901	0.937	0.885	1.089	1.035	1.077	1.065
2000- 05-16		6.00	Dec-99	0.954	0.943	0.952	0.912	0.899	0.978	1.081
			Jan-00	0.955	0.897	1.195	0.977	0.914	0.862	1.039
			Feb-00	1.082	0.929	0.917	0.884	0.960	1.004	0.981
			Mar-00	1.043	1.108	1.000	1.001	1.051	1.077	1.108
			Apr-00	0.924	0.959	0.992	1.037	1.038	1.003	1.024
			May-00	0.975	1.181	0.932	1.119	1.195	1.012	1.012
			Jun-00	0.991	1.025	1.012	1.061	1.030	0.983	1.003
			Jul-00	0.969	0.984	1.132	1.066	0.956	0.900	0.996

			Aug-00	0.981	0.973	0.978	0.892	1.190	1.021	1.060
			Sep-00	1.049	1.058	0.903	1.055	1.009	1.001	0.912
			Oct-00	0.890	1.062	1.131	1.090	1.228	1.066	0.941
			Nov-00	0.983	1.039	1.153	1.042	1.041	0.936	0.851
			Dec-00	1.121	1.061	0.952	0.974	1.170	1.024	1.047
			TOTAL RETURN	- 1.57%	0.83%	- 0.62%	0.64%	1.65%	- 2.06%	0.45%
2001- 01-03	Jan 2001- Sept 2015	5.75	Jan-01	1.062	0.951	1.022	0.953	1.001	1.099	1.170
2001- 01-04		5.50	Feb-01	0.943	1.011	1.072	0.938	1.095	1.050	0.950
2001- 01-31		5.00	Mar-01	1.027	0.972	0.868	0.906	0.999	0.992	0.906
2001- 03-20		4.50	Apr-01	0.982	0.980	1.023	0.978	1.057	0.999	1.162
2001- 04-18		4.00	May-01	1.082	1.026	0.998	1.047	1.023	1.098	1.103
2001- 05-15		3.50	Jun-01	1.035	0.993	0.947	0.951	0.994	1.026	0.979
2001- 06-27		3.25	Jul-01	0.999	1.037	0.991	1.008	0.908	0.969	0.926
2001- 08-21		3.00	Aug-01	1.059	1.031	1.043	1.061	1.047	1.015	1.005
2001- 09-17		2.50	Sep-01	0.912	1.006	1.014	0.968	1.029	0.825	0.845
2001- 10-02		2.00	Oct-01	0.987	1.010	1.065	1.013	0.972	1.147	1.053
2001- 11-06		1.50	Nov-01	1.063	1.008	0.958	1.000	1.012	1.051	1.130

2001-12-11		1.25	Dec-01	1.058	1.023	1.074	1.016	0.983	1.006	1.065
2002-11-06		0.75	Jan-02	0.991	1.032	0.916	0.962	1.085	1.061	1.036
2015-09-01		0.75	Feb-02	0.989	1.016	1.081	1.081	1.050	0.984	1.037
			Mar-02	1.053	1.008	1.061	1.083	1.016	1.085	1.075
			Apr-02	1.062	1.018	1.072	1.050	1.033	1.023	1.054
			May-02	1.035	1.019	1.114	0.995	1.045	0.973	0.957
			Jun-02	0.950	0.969	0.969	0.997	0.780	0.963	0.924
			Jul-02	0.922	0.913	0.846	0.927	1.041	0.893	0.842
			Aug-02	0.942	0.996	1.109	1.024	1.089	1.044	1.056
			Sep-02	0.975	0.951	0.941	0.945	0.787	0.893	0.964
			Oct-02	0.967	1.080	1.127	0.996	1.049	1.016	1.125
			Nov-02	1.092	0.994	0.972	0.969	0.934	1.117	1.086
			Dec-02	0.983	1.011	0.959	0.968	1.090	0.934	0.850
			Jan-03	0.983	0.936	0.999	0.942	0.938	1.018	0.904
			Feb-03	0.948	0.950	0.920	0.992	1.012	1.026	0.974
			Mar-03	1.046	1.002	0.874	1.010	0.803	1.037	0.995
			Apr-03	0.990	1.048	1.076	1.022	1.027	1.043	1.168
			May-03	1.120	1.054	0.983	1.102	1.325	1.024	1.074
			Jun-03	1.000	1.009	0.977	1.008	1.109	0.975	1.065
			Jul-03	1.019	0.983	1.012	0.982	0.887	1.036	0.987
			Aug-03	1.028	1.003	1.078	0.980	1.025	1.042	1.050
			Sep-03	1.008	1.020	0.965	0.985	1.081	0.994	0.968
			Oct-03	1.111	1.032	1.061	1.057	1.061	1.110	1.030
			Nov-03	1.062	1.030	1.032	1.024	1.116	1.013	1.053

			Dec-03	1.052	1.014	1.058	1.066	1.057	0.992	1.069
			Jan-04	0.972	1.009	1.056	0.971	1.021	0.999	1.003
			Feb-04	1.021	1.062	1.058	1.026	1.038	1.034	1.008
			Mar-04	1.041	1.007	1.040	0.998	0.960	0.964	1.023
			Apr-04	0.998	1.031	1.046	1.004	1.019	0.942	0.982
			May-04	1.012	0.975	1.021	1.023	0.874	1.029	1.005
			Jun-04	1.036	1.026	1.046	0.998	1.060	1.033	1.035
			Jul-04	0.951	0.961	0.799	0.900	0.963	0.945	0.937
			Aug-04	1.019	1.001	1.001	1.019	1.032	1.012	0.982
			Sep-04	1.030	0.996	0.960	0.921	0.975	1.081	1.037
			Oct-04	1.025	1.036	1.067	1.011	1.028	0.993	1.029
			Nov-04	1.006	1.035	1.010	0.993	1.174	1.067	1.070
			Dec-04	1.043	1.054	0.993	1.044	1.075	1.047	1.082
			Jan-05	0.972	0.998	1.030	0.993	1.044	0.979	0.951
			Feb-05	1.029	0.989	0.997	1.015	1.031	0.998	0.988
			Mar-05	1.008	0.987	0.997	0.990	1.003	0.938	1.002
			Apr-05	0.987	0.998	1.013	1.022	0.987	0.885	0.963
			May-05	1.047	1.017	1.037	1.024	1.032	1.033	1.044
			Jun-05	0.994	0.977	1.022	0.961	0.977	1.018	0.987
			Jul-05	1.045	1.012	1.043	1.017	1.036	1.031	1.035
			Aug-05	0.960	0.986	0.978	1.005	1.045	1.028	0.987
			Sep-05	1.015	1.015	0.918	1.006	1.047	0.965	0.985
			Oct-05	0.955	0.964	0.990	1.006	1.017	0.930	0.963
			Nov-05	0.966	0.997	1.046	1.015	0.974	1.060	1.052
			Dec-05	0.997	0.998	0.996	0.979	1.042	0.987	0.989
			Jan-06	1.027	1.016	1.034	0.993	0.976	1.068	1.033

			Feb-06	1.006	1.016	1.004	1.020	0.999	1.010	1.011
			Mar-06	1.047	1.024	1.068	1.002	1.001	1.040	1.034
			Apr-06	0.984	1.023	1.007	1.009	1.033	0.924	1.039
			May-06	0.942	1.039	1.034	1.038	0.991	0.976	1.016
			Jun-06	1.002	0.984	1.030	0.991	1.030	1.012	1.008
			Jul-06	1.029	1.019	1.034	1.044	1.090	0.964	0.927
			Aug-06	1.100	1.026	0.966	1.023	1.043	1.035	1.023
			Sep-06	0.987	1.014	0.988	0.999	0.936	1.052	1.050
			Oct-06	0.955	1.011	0.942	1.004	1.054	1.130	1.083
			Nov-06	1.080	1.005	0.997	0.995	1.034	1.012	1.050
			Dec-06	1.071	1.007	1.025	1.024	1.030	0.988	1.050
			Jan-07	1.042	1.002	1.031	1.017	1.013	1.015	1.064
			Feb-07	0.976	0.988	0.966	0.974	0.965	1.027	0.948
			Mar-07	1.045	1.024	1.045	1.025	1.049	1.005	0.999
			Apr-07	1.064	1.038	1.052	1.049	1.028	1.090	1.009
			May-07	1.038	1.005	1.050	1.034	1.026	0.996	1.018
			Jun-07	1.070	0.997	1.003	0.979	0.999	0.949	0.986
			Jul-07	0.962	0.953	0.981	0.988	0.949	0.929	0.991
			Aug-07	1.074	1.018	1.054	1.035	1.043	0.957	1.042
			Sep-07	1.206	1.021	1.079	1.068	1.010	0.952	1.120
			Oct-07	1.136	0.980	1.113	1.042	1.046	0.971	1.002
			Nov-07	1.009	1.014	0.925	1.021	1.066	0.925	0.915
			Dec-07	1.116	0.998	0.982	0.990	0.980	0.952	0.960
			Jan-08	0.995	0.922	0.865	0.921	0.997	0.958	0.900
			Feb-08	1.028	1.031	1.029	1.011	0.971	0.920	0.944
			Mar-08	0.962	1.023	0.980	1.038	1.000	1.035	0.974

			Apr-08	1.027	1.039	0.968	0.973	0.904	1.056	0.982
			May-08	1.109	1.009	0.921	1.014	1.103	1.039	0.988
			Jun-08	0.983	0.905	0.865	0.950	0.934	0.899	0.793
			Jul-08	0.951	1.061	0.987	1.026	1.021	1.100	0.977
			Aug-08	0.964	0.995	1.077	1.012	1.031	0.962	1.058
			Sep-08	0.871	0.987	1.008	1.019	0.946	0.951	0.837
			Oct-08	0.890	0.905	0.776	0.853	0.948	0.767	0.685
			Nov-08	0.893	0.927	0.854	1.038	0.892	0.881	0.758
			Dec-08	0.903	1.025	1.180	0.983	0.997	1.122	1.077
			Jan-09	1.072	0.998	0.926	0.926	0.985	0.856	0.872
			Feb-09	0.995	0.890	0.968	0.953	0.918	0.859	0.839
			Mar-09	1.089	1.010	1.149	1.070	1.068	1.053	1.093
			Apr-09	1.031	1.035	1.285	0.986	1.021	1.228	1.388
			May-09	0.970	1.076	1.009	1.095	1.095	1.028	1.090
			Jun-09	0.919	1.026	0.987	1.016	1.000	0.976	0.956
			Jul-09	1.121	1.073	1.069	1.037	1.073	1.110	1.150
			Aug-09	0.998	1.002	1.061	0.993	1.003	1.051	1.109
			Sep-09	0.933	1.024	1.060	1.077	1.048	1.040	1.109
			Oct-09	0.877	1.008	0.959	1.010	0.993	1.016	0.879
			Nov-09	1.181	1.020	1.004	1.053	1.022	1.042	1.088
			Dec-09	1.020	1.029	1.056	0.993	1.033	1.038	1.001
			Jan-10	0.934	1.006	0.976	0.963	0.969	0.977	1.023
			Feb-10	0.934	1.033	1.137	1.003	1.050	1.145	1.032
			Mar-10	1.020	1.045	1.082	1.061	1.064	1.066	1.141
			Apr-10	0.898	1.002	0.983	0.982	0.970	0.991	1.151
			May-10	0.818	0.961	0.998	0.961	0.923	0.943	0.925

			Jun-10	0.915	0.988	0.993	0.984	1.035	0.959	0.897
			Jul-10	1.187	1.029	1.066	1.084	1.111	1.022	1.096
			Aug-10	0.908	1.010	0.996	1.000	1.000	0.977	0.989
			Sep-10	0.943	1.024	1.040	1.050	1.100	1.108	1.151
			Oct-10	1.194	1.038	1.073	1.019	1.053	1.021	1.154
			Nov-10	1.009	0.974	1.009	1.020	0.962	1.093	1.069
			Dec-10	1.158	1.046	1.009	1.036	1.043	1.020	0.987
			Jan-11	1.050	0.981	1.019	0.964	0.971	0.933	1.036
			Feb-11	0.988	1.068	1.032	1.006	1.090	1.062	1.012
			Mar-11	1.003	1.016	1.046	1.034	1.053	1.016	0.990
			Apr-11	0.958	1.057	1.052	1.039	1.049	1.044	1.064
			May-11	1.029	1.021	1.037	1.005	1.041	0.992	0.995
			Jun-11	1.015	0.989	1.040	1.006	0.944	0.994	0.982
			Jul-11	1.013	0.996	0.941	0.970	1.033	0.946	1.061
			Aug-11	0.933	0.986	1.022	1.022	0.999	0.970	0.938
			Sep-11	0.872	0.964	0.974	0.962	0.947	0.906	0.789
			Oct-11	1.210	1.039	1.026	1.019	1.083	1.162	1.151
			Nov-11	1.003	1.007	0.992	1.005	1.076	0.995	0.970
			Dec-11	0.960	1.012	1.026	1.040	1.037	0.936	0.958
			Jan-12	1.168	1.006	1.042	0.977	0.954	1.110	1.124
			Feb-12	0.949	1.020	1.048	1.008	1.096	1.063	1.056
			Mar-12	1.030	1.016	1.042	1.060	1.054	1.031	1.042
			Apr-12	0.960	1.011	1.032	1.013	1.016	1.011	0.973
			May-12	1.005	0.970	1.015	0.998	0.967	0.924	0.871
			Jun-12	1.069	1.014	1.022	1.057	1.059	1.013	1.003
			Jul-12	1.033	0.973	1.028	1.020	1.044	1.063	0.882

			Aug-12	1.022	1.044	0.930	1.003	0.970	1.033	1.081
			Sep-12	1.047	1.011	1.017	0.990	1.005	1.001	1.069
			Oct-12	0.952	0.994	0.973	0.981	0.974	0.991	1.022
			Nov-12	1.059	1.040	1.032	1.020	1.031	1.022	1.021
			Dec-12	1.030	0.993	0.964	0.992	0.943	0.988	1.041
			Jan-13	1.070	1.075	1.024	1.051	1.060	1.028	1.156
			Feb-13	0.996	1.048	1.035	1.052	1.023	1.059	0.988
			Mar-13	1.046	1.080	1.048	1.053	1.026	1.074	1.078
			Apr-13	1.014	1.017	1.048	1.036	1.043	1.044	1.045
			May-13	0.950	0.980	0.950	0.985	0.968	1.006	1.025
			Jun-13	0.990	1.008	1.011	1.009	0.974	1.016	0.951
			Jul-13	1.012	1.055	1.004	1.027	1.021	0.990	1.061
			Aug-13	0.987	0.964	0.955	0.961	0.948	0.986	1.033
			Sep-13	1.062	0.997	1.000	1.013	1.042	1.037	1.112
			Oct-13	1.010	1.052	1.047	1.063	1.047	1.099	1.036
			Nov-13	1.076	1.000	1.023	1.012	0.973	1.032	1.031
			Dec-13	1.031	1.029	1.034	0.996	1.033	1.023	1.080
			Jan-14	0.920	0.965	0.927	0.995	0.913	0.914	1.008
			Feb-14	1.030	1.050	1.023	1.016	1.036	1.034	1.092
			Mar-14	1.037	1.032	1.017	1.048	1.036	1.045	0.929
			Apr-14	0.974	1.001	1.041	1.016	1.053	0.989	0.955
			May-14	1.099	1.051	1.006	1.032	1.038	0.989	1.035
			Jun-14	1.026	1.000	1.041	1.029	0.989	1.007	1.022
			Jul-14	0.918	0.952	0.931	0.971	0.965	0.944	0.966
			Aug-14	1.031	1.062	1.078	1.055	1.051	1.030	0.974
			Sep-14	0.976	0.980	1.025	1.008	1.022	0.920	0.962

			Oct-14	1.033	1.027	0.997	1.033	1.061	1.047	0.999
			Nov-14	1.037	1.049	1.076	1.044	1.008	1.026	0.991
			Dec-14	0.999	0.987	0.948	0.957	0.969	0.974	0.951
			Jan-15	0.991	0.979	0.989	1.009	1.030	0.999	1.001
			Feb-15	1.021	1.037	1.065	1.044	1.055	1.055	1.059
			Mar-15	0.947	1.025	0.954	0.979	0.912	0.959	0.977
			Apr-15	1.011	0.998	0.996	0.995	1.059	1.093	1.026
			May-15	1.034	1.028	1.002	1.020	1.013	0.964	1.017
			Jun-15	0.924	0.992	0.977	0.983	0.974	1.005	1.014
			Jul-15	0.973	1.036	1.067	1.035	1.096	0.962	1.080
			TOTAL RETURN	0.88%	0.77%	0.91%	0.63%	1.26%	0.60%	0.83%