Sector Rotation and Interest Rate Policy

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ARTICLE INFO	ABSTRACT
	This paper investigates the efficiency of equity allocation strategy based on changes in the U.S. prime bank rate. A sector rotation strategy based on changes in interest rates is one of the ways investors can maximize their returns. The study used the U.S. monthly bank prime loan rate from January 31, 1949 to December 31, 2012 as the indicator variable for interest rate changes, and changes in the rate were labeled as either expansive or restrictive policy shifts. The study evaluates the monthly returns equally weighted (including distributions) of U.S. equity stocks listed in the CRSP data base. Betas were obtained by regressing the monthly equally weighted returns against the monthly Dow Jones industrial index. The results show that a sector rotation strategy based on changes in monetary policy particularly interest rate adjustments can significantly improve the performance of an investor's portfolio.

1. Introduction

The underlying thinking in sector rotation strategy is that you invest in sectors that are generally expected to perform well given the existing state of the economy, given that sectors perform differently when the economy is growing as against when it is not. This was the general message advanced by Stovall (1996). Stovall (1996) saw the economic cycle as a four phase phenomenon namely: full recession, early recovery, late recovery, and early recession. It also involved indicating which stocks performed well at each stage of the cycle. It is the view that cyclical stocks should be acquired at the beginning of a recession as these are stocks that normally perform well when the economy is in a growth phase (expanding) and perform poorly when the economy is contracting.

The basic implementation of a sector rotation strategy requires that you allocate your investment by identifying the stages of the economic cycle and then selling those sectors that are expected to perform poorly, and then acquiring sectors that are expected to do well. Therefore, the idea that different sectors within the economy benefit differently from the phases of the economic cycle, and thus the understanding that the prices of some sector indices do move independently of others, is not new. The idea of systematic sector rotation is based on the general principle that sectors within the economy do not follow the same pattern over time, but move differently one from another (Stovall 1996).

It is argued that there are two main reasons that seem to underpin this behavior. Advocates argue that the first is the presence of fundamentals. These are sectors that benefit relative to others during the growth phase of the economy (e.g. leisure and hotel). The second reason appears to be psychological in nature and it reflects investors' belief about a sector's future performance relative to another or a momentarily fashion. Therefore at each point of the economic cycle there appears to be sectors that have more chances than others to generate extra returns (Tani and Sassetti 2003). Thus the aim of sector rotation is to switch portfolio regularly so as to earn some of the extra returns that different sectors experience relative to the rest of the market (Tani and Sassetti 2003).

This study investigates the efficiency of equity allocation strategy based on changes in the U.S. prime bank rate. Based on the assessment of the literature, it is believed that there is a void regarding studies which investigate sector rotation strategies based on changes the prime bank rate. Studies done by Conover,

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Jensen, Johnson and Mercer (2005 & 2008) bear some resemblance to this current study, they examine sector rotation and monetary conditions with emphasis on the Federal Reserve monetary policy. Therefore, while the approach of this study will take a similar direction, this study looks at a more extended period from 1949 to 2012.

2. Review of Related Literature

Researchers have examined sector rotation strategies that take advantage of different stages of the business cycle. Therefore, advocates believe that if one is able to correctly identify the stage of the business cycle, then one would be able to determine which sector will outperform or underperform the market (Luk 2012). Stovall (1996) in his "Guide to Sector Investing" divided the business cycle into five stages by using the National Bureau of Economic Research (NBER) cycle's peak and trough dates and thus was able to identify the best performing industries in each stage of the business cycle. Jacobsen and Stangl (2009) examined a rotation strategy that assumed perfect timing of business cycle stages as presented by Stovall (1996) and rotated 48 U.S. industries according to Stovall's list of expected best performing industries. The strategy resulted in 2.3% annual excess return (before transaction costs) from 1948 to 2007 (Luk 2012). Another study by Kouzmenko and Nagy (2009) examined the relationship between sector performance and business cycle in developed markets in U.S., Europe, and Japan between 1976 and 2009 using Organization for Economic Cooperation and Development Composite Leading Indicators (OCED CLIs). For the purpose of that study, Kouzmenko and Nagy (2009) defined periods of rising CLIs as expansion and periods of falling CLIs as contraction. It was observed from the study that sectors with strong cyclical behavior significantly outperformed sectors with strong defensive behavior during expansions and vice versa (Luk 2012).

Conover et al. (2007) argue that the sector or industry dimension has long held an important place in investment management in respect of top-down analysis. They further contend that there is evidence to suggest that allocating assets based on sector or the industry is gaining importance and will continue to gain prominence in the future (Conover et al. 2008). The view that was once held was that country factor dominated the industry factor, however subsequent studies have shown that industry factor for stock return is as strong as or even stronger than the country factor (Conover et al. 2008). A study conducted by Froot and Melvyn (2004) supported the general idea of sector rotation strategies in institutional trading as the results showed that the strongest trading patterns were based on sector dimensions.

Several studies have examined various investment mechanisms such as stocks/bonds, value/growth stocks, and different rotation indicator variables such as the business cycle, the term premium (Conover et al. 2008). Interestingly, Siegel (1991) study revealed excess returns for a rotation strategy that switches from stocks to bonds based on the business cycle, however Ahmed, Lockwood, and Nanda (2002) whose rotation strategy was across multi-style categories (e.g. small-cap value stocks) generated better results than rotating across single styles categories (e.g. small cap stocks) (Conover et al. 2008).

The issue of stock momentum is also relevant to sector rotation. Scowcroft and Sefton (2005) investigated what drives stock momentum. Given that most research has been focused on individual stock momentum, there appears to be no consensus as to what factors drive them. Therefore, Scowcroft and Sefton (2005) performed a sector rotation strategy along with a country rotation strategy so as to determine if they could produce abnormal returns. The period under investigation was 1980 to 2003 and they used the MSCI world index. Scowcroft and Sefton (2005) performed the rotation strategy by buying all the stocks in the two best and worst performing sector so as to create a winner and loser portfolio respectively. Interestingly, the sector rotation return strategy generated higher returns that the individual stock momentum strategy. In order to better understand what factors drive the stock momentum, Scowcroft and Sefton (2005) performed a Linear Factor Model (LFM). The LFM contains the industry, country and country specific factors. The results showed that 58% of the momentum was due to the industry momentum and stock momentum explained only 8% when they used a market value weighted portfolio. However, when using equally weighted portfolio, they found that on average 66% was explained by stock momentum (Dellgren and Larsson 2009).

Style rotation strategy study in the UK stock market was carried out by Levis and Liodakis (1999) that was based on an ex ante indicator of the business cycle. They found that rotation strategies that allocate across firm capitalization tend to generate more attractive returns than strategies allocate across value or growth

classification (Conover et al. 2008). In a slightly different approach, when Sorensen and Burke (1986) use relative strength analysis for 43 industries, they found that an industry momentum based rotation strategy produced abnormal profits. Similarly, Cavaglia and Moroz (2002) showed that a strategy that involves investing in industries that are profitable, attractively priced and have positive momentum normally generate excess returns (Conover et al. 2008).

2.1 Interest Rate changes and Sector Response

It is agreed that interest rate changes will impact the sectors on the stock market in varied ways. Generally, the broader S&P Index is comprised of 10 economic sectors. One of the sectors is the defensive sector which includes consumer staples, health care, utilities and telecom services. These sectors are so termed defensive because changes in the economy and interest rates have a less than significant impact on the revenue and earnings of the companies within these sectors (Montgomery 2013).

Cyclical sectors include energy, information technology, industrials, and materials. These are cyclical because the economic cycle has a significant impact on the revenue and earnings of companies within them. There are sectors which are sensitive to interest rate changes; these include consumer discretionary and financials. It is argued that low interest rates make it easier for consumer to purchase from consumer discretionary companies, and a financial stock's profitability is dependent on the interest rate environment. Therefore, the performance of many stocks in these sectors is sensitive to adjustments in the interest rate (Montgomery 2013).

The impact of changes in the Fed discount rate on securities performance has long been noted. Jensen and Johnson (1995) have associated changes in the Fed discount rate with trends in long-term security returns. Conover et al. (2008) reporting on the work of Jensen and Johnson (1995) stated that: "in examining the daily returns following policy shifts, the authors note that positive excess returns prevail for an extended period following a shift to an expansive Fed policy, while negative excess returns are common following a shift to a restrictive policy". Conover et al. (2008) in making a case for the use of monetary policy as a rotation indicator variable, argue that monetary policy shifts have superior advantages over other indicators. They argue that Fed policy shifts normally occur infrequently and thus a rotation strategy based on policy shifts would therefore require infrequent portfolio reallocation. Secondly, Conover et al. (2008) claim that Fed policy shifts are normally widely publicized and binary (i.e. up or down) this makes the indicator objective and easy to be identified. The third point made by Conover et al. (2008) in support of the use of monetary policy as a basis for rotation is that monetary shifts can be identified on an ex ante basis, and this therefore eliminates any "look-ahead bias" from the results.

While there appears to be a plausible argument for the use of interest rate changes as a sector rotation variable strategy, one should proceed with caution and be aware of some possible inherent problems with such a strategy. Conover et al. (2008) reminds us beautifully of the potential dangers that lie ahead when there remarked that:

> "Consistent with other indicator variables, there is no evidence indication that policy shifts cause pattern in long-term stock returns; the shifts have only been associated with security return patterns. The interdependence between Fed policy shifts and business and economic conditions is extremely complicated. This complication results because Fed actions are based on current and forecasted changes in business and economic conditions, and in addition, Fed actions impact current and future business and economic conditions."

Therefore with that cautionary note, the methodology that is use in assessing the effectiveness of a sector rotation strategy based on interest rate changes is outlined below.

3. Sample and Methodology

In order to provide a basis for an in-depth understanding of the impact of rate changes on sector performance, the sample data covers the period January 1949 to December 2012. The study evaluates the monthly returns equally weighted (including distributions) of U.S. equity stocks listed in the CRSP data base. These companies were them coded into ten sectors namely: Basic Materials, Consumer Cyclicals, Financials, Consumer Goods, Utilities, Technology, Non-Cyclical Consumer Goods, Cyclical Services, Resources, and General Industries. The study used the U.S. monthly bank prime loan rate from January 31, 1949 to December 31, 2012 as the indicator variable for interest rate changes and changes in the rate were

labeled as either expansive or restrictive policy shifts. The bank prime loan rate was obtained from the Federal Reserve interest rate database and 1949 was the first period for which data were available.

4. Results

Table 1 provides information for the ten sectors included in the study. The ten sectors were classified into cyclical and noncyclical sectors. Cyclical sectors are normally more sensitive to market changes as this can be seen based on the range in the mean return from a low of 11.40% for consumer goods to a high of 14.88% for basic industries.

Table 1: Sector Returns: 1925 through 2012

Sector	Mean Return	Standard Deviation	Beta
Noncyclicals			
Utilities	14.04%	26.36%	.04
Noncyclical Consumer Goods	14.52%	25.88%	-.018
Resources	12.84%	23.28%	-0.58
Cyclicals			
Basic Industries	14.88%	23.93%	.011
Consumer Cyclical	12.48%	18.81%	-.002
Financials	12.36%	19.19%	-0.003
Consumer Goods	11.40%	18.26	-0.003
Technology	11.88%	18.84%	-0.054
General Industries	14.72%	25.95%	-0.048
Cyclical Services	11.86%	18.46%	0.083

The mean and standard deviation are annualized for explanatory purposes. The monthly returns are compounded by 12 and the standard deviations are multiplied by the square root of 12. Betas are obtained by regressing the monthly equally weighted returns against the monthly Dow Jones industrial index.

Table 2:   Periods of Major Changes in Prime Bank Loan Interest Rate

Policy Period	Policy	Start Date	Start Rate
1	Expansive	01/31/1949	2.00%
2	Restrictive	09/30/1950	2.08%
3	Restrictive	10/31/1950	2.25%
4	Restrictive	02/28/1951	2.50%
5	Restrictive	01/31/1952	3.00%
6	Restrictive	05/31/1953	3.25%
7	Expansive	04/30/1954	3.00%
8	Restrictive	11/30/1955	3.5%
9	Restrictive	11/30/1956	4.00%
10	Restrictive	09/30/1959	5.00%
11	Expansive	09/30/1960	4.50%
12	Restrictive	01/31/1966	5.00%
13	Restrictive	12/31/1967	6.00%
14	Restrictive	02/28/1969	7.00%
15	Restrictive	06/30/1969	8.23%
16	Expansive	02/28/1971	5.88%
17	Expansive	02/29/1972	4.75%
18	Restrictive	01/31/1973	6.00%
19	Restrictive	04/30/1974	10.02%
20	Expansive	03/31/1975	7.93%
21	Expansive	10/31/1976	6.77%
22	Restrictive	12/31/1978	11.55%
23	Restrictive	12/31/1980	20.35%
24	Expansive	08/31/1982	14.39%
25	Expansive	06/30/1985	9.78%
26	Restrictive	09/30/1988	10.00%
27	Expansive	01/31/1992	6.50%
28	Restrictive	02/28/1995	9.00%
29	Expansive	07/31/2001	6.75%
30	Expansive	12/31/2001	4.84%
31	Expansive	07/31/2003	4.00%
32	Restrictive	06/30/2006	8.02%
33	Expansive	10/31/2008	4.56%
34	Expansive	01/31/2009	3.25%
35	Expansive	12/31/2012	3.25%

Table 3: Sector Performance by Interest Rate Periods: Means and (Standard Deviations)*

Sector	Expansive Period Returns	Restrictive Period Returns
Noncyclicals		
Utilities	**14.18%** (19.44)	**12.82%** (19.26%)
Noncyclical Consumer Goods	**12.87%** (18.16%)	**12.77%** (17.60%)
Resources	**14.62%** (19.25%)	**10.16%** (17.61%)
Average for Noncyclicals	**13.89% (**18.95%)	**11.92% (**18.16%)
Cyclicals		
Basic Industries	**19.84%** (16.67%)	**10.43%** (17.08%)
Consumer Cyclical	**13.81%** (17.88%)	**11.04%** (20.31%)
Financials	**13.35%** (18.23%)	**12.63%** (17.67%)
Consumer Goods	**12.40%** (18.70%)	**10.74%** (18.01%)
Technology	**13.88%** (18.95%)	**11.01%** (17.80%)
General Industries	**15.81%** (16.89%)	**13.24%** (18.64%)
Cyclical Services	**13.19%** (17.84%)	**11.38%** (18.50%)
Average for Cyclicals	**14.47% (**17.88%)	**11.64%** (18.28%)

*Standard deviations are shown in parentheses.

Table 2 shows the number of policy periods changes with respect to the prime bank loan interest rate. Each policy shift was interpreted as either restrictive or expansive based on the direction of the change and hence the effect on the general economy.

Table 3 presents the sector returns and standard deviations for both expansive and restrictive periods. The results clearly indicate that the average returns are higher for each sector whenever there is an expansive policy shift (lowering of interest rates). Individual sectors perform better during periods when interest rates are lower when compared with periods when rates have increased. Cyclical sectors are very sensitive to interest rate changes and thus it can be seen that the range of returns is greater for the cyclical sector during the expansive periods (19.84% - 12.40%) which is 7.44% as compared with the range in the expansive periods for noncyclical sector (14.62% - 12.87%) which is 1.75%. The performance of the noncyclical sectors further strengthens the point that during periods of contraction these sectors tend to perform better than others as the average level of volatility in these sectors is less when compared with the cyclical sectors.

5. Summary and Conclusions

Thestudy provides results that clearly show that a sector rotation strategy based on changes in monetary policy particularly interest rate adjustments can significantly improve the performance of an investor's portfolio. The results show that based on the Fed policy shift it is an indicator as to how the investor should react. During periods of expansive policy shifts, investors should be move to cyclical stocks and similarly when an announcement is made that indicates a restrictive policy shift, then one should move to defensive stocks (noncyclicals). Overall, the results would suggest that by using monetary policy as a guide to an investment strategy it can be successfully used to improve the performance of a portfolio even when the market is characterized as extremely bear. While there are many other adjustments and other refinement of interest rate policy that could be employed in such a study, this study proves that there are benefits to be gained from a sector rotation strategy that uses interest rate changes as signals for initiating movements between cyclical and noncyclical sectors.

References

Ahmed, P, Larry J. L, and Sudhir. N. (2002). "Multistyle Rotation Strategies". *Journal of Portfolio Management*, 28 (Spring) :17-29.

Cavaglia, S. and Vadim, M. (2002). "Cross-Industry, Cross Country Allocation." *Financial Analysts Journal* 58 (November/December): 78-97.

Conover, C. M., Jensen, G., Johnson, R. and Mercer.M.(2005). "Is Fed Policy Still Relevant for Investors?" *Financial Analysts Journal*, 61 (January/February): 70-79.

Conover, C. M., Jensen, G., Johnson, R. and Mercer, M.(2008). Sector Rotation and Monetary Conditions, *Journal of Investing,* 28 (1): 34-46.

Dellgren, P. and Larsson, M. (2009). Sector Rotation Strategy Applied on the Swedish Stock Market, *Uppsala University.*

Froot, K., and Melvyn T. (2004). "Equity Style Returns and Institutional Investor Flows." NBER Working Paper 10355.

Jensen, G. R. and Johnson.R. (1995). "Discount Rate Changes and Security Returns in the U.S., 1962-1991," *Journal of Banking and Finance* 19, 79-95.

Kouzmenko, R. and Nagy, Z. (2009). Sector Performance across Business Cycles," MSCI Research Bulletin.

Levis, M. and Liodakis, M. 1999. "The Profitability of Style Rotation Strategies in the United Kingdom" *Journal of Portfolio Management* 26 (Fall): 73-86.

Luk, P. (2012). Is there value in Asia ex-Japan Sector Rotation Strategies? www.spdji.com.

Montgomery, J. (2013). What if Interest Rates Rise? The Impact of Rising Interest rates on Equities. www.janney.com.

Scowcraft, A. and Sefton, J. (2005). Understanding Momentum, *Financial Analyst Journal,*61 (2): 64-82.

Sorensen, E. H., and Burke. T. (1986). "Portfolio Returns from Active Industry Group Rotation." *Financial Analysts Journal* 42 (September/October): 43-50.

Stangl. J., Jacobsen, B, and Visaltanachoti, N. (2008), Sector Rotation: Timing the Cycles *Infinz Journal* (September): 18-24.

Stovall, S. (1996). Sector Investing, New York: McGraw Hill.

Siegel, J. J. (1991). "Does it Pay Stock Investors to Forecast the Business Cycle?" *Journal of Portfolio Management,* 18 (Fall): 27-34.

Tani, M. and Sassetti, P. (2003). Dynamic Asset Allocation using Systematic Sector Rotation. *Working Paper Series.*