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Is Fed Policy Still Relevant for Investors?

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Abstract

Using 38 years of data, we show that U.S. monetary policy has had, and continues to have, a strong relationship with security returns. Specifically, we find that U.S. stock returns are consistently higher and less volatile during periods when the Federal Reserve is following an expansive monetary policy. Further, firms considered to be more sensitive to changes in monetary conditions, such as small firms and cyclicals, exhibit monetary-policy-related return patterns that are much more pronounced than average. Lastly, the influence of U.S. monetary policy is shown to be a global phenomenon, as international indices have return patterns similar to those for the U.S. market. Overall, our evidence suggests that investment professionals should continue to use monetary conditions when performing fundamental analysis of both U.S. and international securities.

Is Fed Policy Still Relevant for Investors?

Investment professionals have long considered monetary policy in evaluating investment decisions. Federal Reserve policy announcements and actions are scrutinized by market participants in an attempt to determine the impact that policy actions will have on security prices. Siegel (1994) notes that the majority of fundamental and technical analyses rely to some extent on monetary policy indicators. Several studies document a systematic relationship between long-term security returns and previous changes in Fed policy. In particular, the results indicate that Fed changes that "tighten monetary policy" are frequently associated with relatively poor subsequent return performance, while changes that "loosen monetary policy" generally coincide with favorable subsequent market performance. This evidence is consistent with the practitioner's view that monetary policy has an important impact on security returns (e.g. Martin Zweig in *Winning on Wall Street*).

Although numerous studies document the relationship between monetary policy and security returns, the relevance of monetary conditions in investment analysis is still debated. Recently, Durham (2003) argues that the relationship between security returns and monetary policy was an anomaly that has more recently been arbitraged away. We believe that additional analysis is warranted before accepting this conclusion. When testing for a relationship between security returns and monetary policy, previous studies have focused on either time-series returns or on cross-sectional differences in returns. We believe that an adequate assessment of the relationship requires examining the two dimensions of returns (cross-sectional and time-series) jointly. Economic theory suggests

that firms with a particular set of attributes will be relatively invariant to changes in monetary policy, while for other firms monetary conditions will be a prominent factor in determining performance. In examining time-series returns, previous studies have generally failed to consider the cross-sectional variation in sensitivity to monetary policy changes, and thus may have mischaracterized the impact monetary conditions have on stock returns.[1]

The purpose of this analysis is to determine the robustness of the relationship between monetary policy and stock returns. We examine the strength of the relationship by evaluating both its cross-sectional and time-series consistency. The cross-sectional consistency is evaluated relative to three alternative characteristics: investment "style," industry affiliation, and country of incorporation. These are common classifications used by investment professionals in designating portfolio selection criteria. Finally, in order to best gauge the time-series consistency of the monetary policy influence, we evaluate stock performance in *each* monetary environment. Without separately evaluating each monetary environment, extreme returns in a single environment may lead to an unjustified conclusion.

Related Research

There has long been a keen interest in the relationship between business conditions, monetary conditions, interest rates, and security returns. For example, nearly twenty years ago, Arnott and Copeland (1985) examined the effectiveness of alternative valuation models across periods characterized by differing economic conditions and

[1] We use the terms "monetary period" and "monetary environment" interchangeably to describe periods in which the Fed is following either an "expansive" policy or a "restrictive" policy.

interest rates.[2] Empirical studies present strong evidence supporting the prominent role that monetary policy plays in the determination of security returns (see as examples Patelis (1997), Thorbecke (1997), and Jensen, Johnson and Mercer (1997)). These studies provide evidence consistent with the traditional view that periods of monetary easing represent favorable periods for the stock market, while periods of monetary tightening are viewed unfavorably. While the importance of monetary conditions is widely acknowledged, it is not universally accepted as indicated by Durham (2003) who suggests that, "for the vast majority of countries (including the United States), the relationship largely vanished in more recent periods."

Asset pricing theory tells us that security returns are linked to the security's sensitivity to changes in undiversifiable risk factors. If monetary policy represents an underlying risk factor that drives security returns, it is reasonable to expect that certain types of securities should exhibit a higher- or lower-than-average sensitivity to changes in monetary conditions. Gertler and Gilchrist (1994) argue that small firms have greater exposure to changes in monetary policy because they are generally less well-collateralized, and thus, should be impacted more by changes in credit conditions induced by Fed policy changes. Jensen, Johnson, and Bauman (1997) suggest that monetary policy has a bigger influence on industries that are more reliant on consumer spending, while Nowak (1993) argues that changes in monetary conditions will influence firms that are more reliant on import/export conditions.

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[2] One model that has recently received a great deal of attention in the financial press is the "Fed model," which compares the market earnings yield to the yield on ten-year Treasury securities. This model, allegedly found in the annals of a Fed report, is not based on any official Fed policy, nor is the model endorsed by the Fed. See Asness (2003) for a complete discussion and test of the Fed model. Our model is fundamentally different from the Fed model because it is explicitly driven by announced changes in Fed policy.

Several recent studies identify differences in cross-sectional returns associated with monetary conditions. In particular, cross-sectional dispersion in return patterns is identified across countries (e.g., Conover, Jensen, and Johnson (1999)), across industries (e.g., Thorbecke (1997)), and across market capitalization and "value/growth" characteristics (e.g., Jensen, Johnson and Mercer (1997) and Jensen and Mercer (2002)). The investment implications of the relationship between monetary policy changes and cross-sectional returns, however, have not been fully investigated because the studies have not examined the time-series consistency of the return patterns.

This analysis extends previous research in several ways. First, we evaluate the relationship between monetary policy and stock returns using common cross-sectional classifications within investment management. Specifically, investment professionals frequently classify investment styles by market-capitalization and value/growth characteristics (e.g., small-cap growth), sector of analysis (e.g., cyclical consumer goods), or region (e.g., Asia). Unlike previous analyses, we examine the size and temporal consistency of return patterns for all three cross-sectional classifications.

Second, we examine aggregate stock returns generated during each of twenty-one separate monetary policy periods. Examining each policy period separately provides a thorough examination of the relationship between monetary policy and returns over time. Third, unlike prior studies that focus on monthly returns, we use daily stock returns. Since prior studies ignore the return in the month in which a policy change occurred, the use of daily data allows a more accurate depiction of the influence that monetary conditions have on security returns.

Finally, since the influence of a change in Fed policy has unpredictable timing, we are careful to include only complete monetary policy environments. Fed policy changes may influence security markets early or late in a particular monetary policy period, which makes it imperative that only complete periods be considered.

Sample and Methodology

Our analysis considers long-term stock returns following changes in monetary policy that are clearly signaled by the Federal Reserve. Returns are separated into twenty-one different monetary periods, and for each period the return is measured starting the day after a two-day announcement period, and ending on the day prior to the subsequent change in policy that is in the opposite direction.[3] Omitting the two-day announcement period represents a conservative approach designed to make the results consistent with an investable strategy. Monetary policy environments are defined following Jensen and Johnson (1995) and Jensen, Mercer, and Johnson (1996). The classification relies on Federal Reserve discount rate changes to identify changes in the Fed's broad policy stance. Specifically, a discount rate increase initiates (or extends a prevailing) restrictive policy environment, while a rate decrease initiates (or extends a prevailing) expansive policy environment. There are several advantages to this approach. First, the monetary policy changes are objectively determined and easily identified by investors, thus making it a practical approach for investors. Second, since the discount

[3] The announcement date (day and time) is identified through the *Wall Street Journal* article announcing a Fed discount rate change. The two-day announcement period includes the first day the market can trade on an announcement and the following day. A two-day period is appropriate because rate change announcements occasionally occur during trading, which may cause the reaction to spill into the next day. It should be noted that the effective date of a rate change occasionally differs from the announcement date; in which cases we use the announcement date.

rate, unlike the Federal funds rate target, has been used throughout the Fed's history, it can be applied for the entire time-series of returns. Third, the Fed has indicated, and empirical studies have confirmed, that discount rate changes serve as signals of the Fed's general long-term monetary policy intentions. Fourth, empirical evidence confirms that this approach of categorizing monetary policy environments effectively establishes periods (expansive versus restrictive) with fundamentally different monetary and reserve aggregate levels and changes.[4]

The monetary periods and their characteristics are detailed in Table 1. Since Fed policy is seldom reversed in the short-run, there are only 21 separate monetary policy environments over the approximately 38-year study period. Expansive (restrictive) policy periods are identified by an "E" ("R"), and as indicated previously, are determined based on directional changes in the Fed discount rate. A restrictive policy environment is a series of a discount rate increases, whereas an expansive policy period is a series of discount rate decreases. The number of trading days per monetary period indicates that the policy periods are generally several months in duration, which supports the view that the Fed signals its long-term policy intentions with changes in the discount rate. The shortest policy period is 69 days, while the longest is 936 days (the average, which is not reported, is 447 days). In the "Number of Rate Changes" column, only four of the 21 periods were single rate change periods, indicating that the majority of Fed rate changes are in the same direction as the previous rate change i.e. they represent a continuation of the policy previously established by the Fed. This suggests that the Fed tends to employ a gradual approach to adjusting the discount rate. The "Speed" variable also suggests that

[4] In particular, Jensen, Mercer, and Johnson (1996) show that M1, adjusted monetary base, adjusted Fed credit, excess reserves, and the federal funds premium all differ significantly across the two environments.

there was a gradual adjustment in the discount rate. Specifically, "Speed" identifies the average change per day (in basis points) in the discount rate during each monetary period. In all but three cases, the adjustment was less than a basis point per day. Overall, the data in Table 1 supports the view that the Fed applies a deliberate, gradual approach to conducting monetary policy.

The empirical analysis is separated into two alternative segments. In the first segment, we evaluate the time-series returns to a broad stock market index to determine the temporal consistency of the aggregate return pattern. The second segment of the analysis focuses on the strength and temporal consistency of returns across three different cross-sectional dimensions: investment strategy, sector of operation, and country of incorporation. In particular, we evaluate returns across time for six alternative investment strategies, ten alternative sector indexes, and six alternative country indexes.[5] Unlike previous studies, we rely on daily returns and are careful to include only complete monetary policy environments in our analysis.[6]

Time-Series Consistency in Monetary Policy Related Return Patterns

Panel A of Table 2 reports stock performance for the Center for Research in Security Prices NYSE/AMEX/NASDAQ value-weighted, total-return index across

[5] The six investment strategy indexes are obtained from Kenneth French's website http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/ and include the following indexes: small capitalization (cap) growth; small cap blend; small cap value; large cap growth; large cap blend; large cap value. The sector indexes are obtained from Thomson Datastream and include an index for each of the ten S&P sectors: Resources, Basic Industries, General Industrials, Cyclical Consumer Goods, Non-Cyclical Consumer Goods, Cyclical Services, Non-Cyclical Services, Utilities, Information Technology, and Financials. The six country indexes are obtained from Thomson Datastream and include: U.S.; World (excluding U.S.); Developed Markets (excluding North America); Europe; Americas; and Asia. The Datastream indices (both country and sector) are value-weighted and rebalanced quarterly.

[6] Jensen, Johnson, and Mercer (2002) present evidence suggesting that return patterns tend to vary systematically across monetary periods. At the time of this writing, the most recent complete monetary environment started in January 2001 and ended in June 2004. Complete return data, however, was not available for this environment and was therefore excluded from the analysis.

restrictive and expansive monetary periods. The daily returns, in Table 2 and all future tables, are annualized for expositional purposes.[7] To avoid any bias associated with including a partial monetary policy period, the full sample period starts on July 19, 1963 (the start of monetary policy environment 1) and ends on January 2, 2001 (the end of the most recent policy environment for which complete return data is available).

We evaluate three sub-periods to facilitate assessment of the time-series consistency of the relationship between stock performance and monetary policy changes. The three sub-periods include eight, seven, and six separate monetary policy environments, respectively, and run consecutively as follows: 7/19/63 – 1/12/73; 1/17/73 – 11/21/84; and 11/27/84 – 1/02/01. Data for the sector and country analyses, which follow in Tables 5 and 6, is not available until 1973. Therefore, the sub-periods are selected to correspond with the availability of these data and to allow for a relatively even split of policy periods in the post-1973 period. In addition, the sub-periods are defined to avoid splitting any of the twenty-one monetary periods across sub-periods.

Results for the full sample period clearly indicate the superior investment performance of the stock market during expansive monetary policy periods. In particular, stocks averaged 21.86% when Fed policy was expansive, but only 2.84% when Fed policy was restrictive. While the economic significance of the return difference (19.02% per year) is obvious, the statistical significance of the difference is confirmed by the reported *p*-value from a difference in means *t*-test.[8] In addition, the standard deviation of returns was higher during restrictive monetary conditions, further supporting the relative

[7] Daily returns are annualized as $\{[\Pi(1 + \text{daily return})]^N - 1\}$. Where N is equal to 1/(number of years in sample). Daily standard deviations are multiplied by $(250)^{1/2}$. Although annual returns are reported, statistical tests are performed on the daily return data.

[8] Where appropriate, *t*-tests (in Table 2 and other tables) were calculated assuming unequal variances.

attractiveness of expansive policy periods. An *F*-test confirmed the statistical significance of the difference in variance.

The sub-period results indicate that the average return difference has decreased over time with the difference falling from 24.18% and 21.92% per year in the two earlier periods to 14.42% per year in the most recent sub-period. This observation is consistent with Durham's (2003) claim that monetary conditions have become a less important consideration in more recent periods.[9] Several aspects of the data, however, suggest that monetary conditions remain an important factor. First, the 14.42% annual return difference reported in sub-period 3 is highly economically significant, and is statistically significant at the 7% level.[10] Second, the lower return difference in sub-period 3 is a one-sided phenomenon. Specifically, the smaller difference results from a higher-than-average return experienced during restrictive monetary policy periods, while there is little change in the average return during expansive periods. Third, the difference in standard deviations is considerably larger in sub-period 3 than the average difference, which contradicts the argument that the performance pattern has diminished.

Panel B in Table 2 reports yields for three-month T-bills corresponding to the full period and each of the three sub-periods.[11] Although stock returns are substantially higher during expansive monetary policy periods relative to restrictive policy periods, the

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[9] While not reported, we also evaluated return differences using Durham's (2003) sub-period of 1986-2000. In contrast to Durham, who used monthly returns, we used daily returns. While Durham reported that returns were not significantly related to monetary conditions for the 1986-2000 period, using daily returns we find an annual return difference of 12.80% with a *p*-value of 0.10. Thus, the use of daily returns improves the precision and results in the identification of a return difference that is economically meaningful and marginally statistically significant.

[10] To test whether monetary conditions had a different relationship with returns in the three alternative sub-periods, we estimated a regression with sub-period interaction dummies. The coefficients on the sub-period interaction dummies were not significant at the 10% level, which also supports the claim that the relationship was not significantly different across the three sub-periods.

[11] The three-month T-bill yields are obtained from Thomson Datastream. The rates are calculated as the midpoint between the bid and offered rates.

opposite relationship exists with short-term Treasury yields. Treasury yields are significantly higher in restrictive relative to expansive policy periods for the full period and each of the sub-periods. Further, the difference in yields is larger than average in sub-period 3, which again is inconsistent with the argument that monetary conditions have become a less important factor for security returns.

The results from Panels A and B together indicate that stock returns were *below* the three-month T-bill yield during *restrictive* monetary periods for the first two sub-periods (3.60% vs. 4.95% and -1.54% vs. 9.52%). Further, restrictive period stock returns were only 0.21% higher (6.58% - 6.37%) than the T-bill yield during the third sub-period. In contrast, stock returns exceeded T-bill yields during expansive monetary environments by 23.50%, 12.98%, and 16.02% for sub-periods 1, 2, and 3, respectively. This evidence also contradicts the claim that the security return patterns associated with monetary conditions have ceased to exist, or diminished, in the most recent time period.

Table 3 provides a more thorough analysis of the time-series relationship, as the returns and standard deviations for each of the twenty-one monetary periods are reported. The performance for restrictive policy periods is presented in the left half of the Table, while the right half reports the data for expansive policy periods. The results in Table 3 demonstrate an impressive consistency in the return patterns. The minimum return in any *expansive* policy period is 13.64% (policy period 18), which exceeds the return in all but three of the restrictive periods. Furthermore, there are four restrictive policy periods with negative raw returns and two other periods where the return is below 4%. In general, the results in Table 3 indicate that there is no readily apparent time trend in the returns in

restrictive or expansive periods. The standard deviations for expansive and restrictive monetary environments also exhibit no apparent time trend.

In our view, the one period that clearly stands out is policy period 19, a recent restrictive period.[12] For this period, the mean return is unusually high and the standard deviation is unusually low, 22.55% and 7.99%, respectively. In contrast, equity performance in the final two monetary policy periods (20 and 21) is consistent with the prior pattern of superior performance during periods of expansive policy and inferior performance during restrictive policy periods. Moreover, four of the last five policy periods are consistent with the long-run relationship. Because there are relatively few separate monetary environments, we have a relatively small "sample size." When this is the case, and if one aggregates returns across periods, unusual performance in a single period (period 19) may cause one to mistakenly conclude there is no longer a significant difference in expansive versus restrictive returns.[13] With the exception of policy period 19, our findings run strongly counter to the claim that the relationship between monetary conditions and security returns has been arbitraged away by investors. Overall, the period-by-period results in Table 3, coupled with the results in Table 2, support the

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[12] Policy period 19 represents an unusual period because, in contrast to previous restrictive periods when the Fed had a propensity to apply an overly restrictive monetary policy, the Fed was able to orchestrate a "soft landing" for the economy. The unusual character of this period is supported by an October 30, 1995 article in Business Week (pg. 31-32) entitled "The Fed's Soft Landing has Room to Glide," which marvels at the Fed's ability to short-circuit inflationary pressures without damaging the expansion that was in place. Further evidence of the uniqueness of this policy period, from an investor's perspective, is provided by a Barron's article (pg. MW3-MW5) on February 27, 1995 entitled, "The Trader: Charmed by Greenspan and Soft-Landing Fever, the Dow Breaks Through to the Other Side." The article notes that the market reacted in "stunning fashion" to Greenspan's testimony indicating that economic growth was slowing to a sustainable level and inflation was under control. This evidence suggests that policy period 19 was atypical of restrictive policy periods.

[13] To assess the influence of policy period 19 on Durham's 1986-2000 sub-period findings, we also calculate the statistics without including period 19. Without period 19, the annual return difference for the 1986 through 2000 period increases from 12.80% to 17.82% and the *p*-value falls from 0.10 to 0.07. Therefore, we can conclude that the combination of using monthly returns, a small sample of policy periods, and the inclusion of policy period 19 causes the monetary policy pattern to diminish substantially.

proposition that the relationship between returns and monetary policy remains strong in the more recent periods.

Cross-Sectional Consistency in Monetary Policy Related Return Patterns - Investment Strategy Returns

Table 4 presents mean stock returns in expansive and restrictive monetary policy environments for six investment strategies that focus on market capitalization (size) and value-versus-growth.[14] We report both mean returns and return differences for the full period (all twenty-one monetary environments). The full period data is reported in the first three columns of the table. For conciseness purposes, we report only return differences for the three sub-periods. Return differences are calculated as the mean return in expansive periods minus the mean return in restrictive periods. The differences in returns for the three sub-periods are reported in the final three columns of the table.

Though the return differences are economically large in all cases, the small-capitalization portfolios exhibit much larger differences. The mean return differences for the three small-cap portfolios are economically and statistically significant in each of the sub-periods, which strongly support the continued relevance of monetary conditions. The more prominent pattern displayed by the small-cap portfolios supports the claim by Gertler and Gilchrist (1994) that small firms are more sensitive to changes in credit conditions. This observation is consistent with the findings of Jensen and Mercer (2002) who show that the small firm effect is dependent on Fed policy. Finally, the stronger small-firm pattern is also consistent with the results of Arnott and Copeland (1985) who

[14] The six portfolios are the intersection of two portfolios formed by sorting firms on size (market equity) and the ratio of book equity to market equity (a proxy for value/growth). The portfolios consist of NYSE, AMEX, and NASDAQ stocks. We thank Kenneth French for making this data available to researchers.

show that smaller companies are more adversely impacted by high real interest rates. As with previous results, the return differences are smallest in the most recent sub-period, but again the unusual performance in policy environment 19 plays an important role in this observation.

The findings in Table 4 suggest that investment professionals should consider changes in monetary conditions and the sensitivities of alternative securities to these changes when making investment decisions. Theory suggests that small firms are more sensitive to changes in monetary conditions, and the results clearly demonstrate that such a relationship has prevailed through time. Although the return differences for two of the large-cap portfolios ("Big") are not statistically significant in the most recent sub-period (policy periods 16-21), we note that the annualized return differences (12.92%, 13.36%, and 9.35%) would be considered substantial by most investment professionals. Again, the relatively small sample size of monetary policy periods combined with the high volatility in daily returns makes statistical significance a very high hurdle.

Cross-Sectional Consistency in Monetary Policy Related Return Patterns – Industry Returns

Table 5 reports mean returns for the ten alternative S&P sector indices.[15] Industry return data was available starting in 1973, which made it necessary to exclude the first eight monetary policy periods. Therefore, Table 5 reports results for the most recent thirteen monetary periods. Following a similar presentation pattern to the one adopted in Table 2, we report returns for the entire data set available (monetary periods 9 through 21) and two sub-periods (9 through 15 and 16 through 21).

[15] The returns for the sector indices were obtained from Thomson Datastream and are value-weighted.

The findings indicate a high degree of cross-sectional consistency in the relationship between monetary conditions and stock returns. Using the data for all policy periods, the return differences are consistent across all ten sectors and statistically significant for eight of the sectors (at a 10% significance level). In particular, the return patterns are most prominent for the cyclical sectors and least pronounced for the defensive sectors. The most prominent pattern in returns is reported for the Cyclical Consumer Goods sector with annualized returns of 25.46% during expansive periods and -8.96% during restrictive monetary periods; a difference of 34.42%. The return differences for the Information Technology sector and Cyclical Service sector are comparable at 31.55% and 26.63%, respectively. The economic significance of these return differences is irrefutable. Furthermore, the *t*-statistics indicate that the differences are also highly statistically significant.[16] The findings support the proposition that the prospects for cyclical stocks are closely linked to monetary policy and its influence on economic activity.

The return patterns across the ten sectors are both prominent and display a high degree of consistency, which provides strong support for the relevance of monetary conditions. In addition, the results are highly consistent with economic theory in that sectors that are considered to be more closely linked with general business conditions display the most pronounced patterns, whereas those sectors that are viewed to be relatively invariant to changes in business conditions display relatively weak patterns.

[16] While not reported in the table, it should be noted that the variance of returns was significantly higher (confirmed by *F*-tests) in restrictive monetary periods relative to expansive periods for each of the ten sectors. Therefore, the superior return performance in expansive periods coincided with favorable risk, which strengthens the claim that expansive monetary periods tend to coincide with superior investment performance.

The sub-period results, reported in the final two columns of the table, indicate that the industry patterns have also been remarkably consistent over time. The return differences are smaller in the latter period, which is consistent with Durham's (2003) evidence. The return differences, however, remain statistically significant, at the 10% level, for six of the ten sectors. Further, the economic significance of the return differences in sub-period 3 is impressive, as the differences exceed 14% per year for seven of the ten sectors. This evidence strongly contradicts the notion that monetary conditions are no longer linked to stock returns.

For nine of the ten sectors, the return differences in the third sub-period were smaller than average, however, the risk differences for all ten indices were actually larger in sub-period 3 (while not reported, the average difference in the standard deviations increased from 1.4% to 5.0%). Therefore, as with the standard deviation results in Table 2, there is evidence that monetary policy has recently become *more* important with respect to stock market risk.

Overall, the results in Table 5 provide support for the importance of performing economic and industry analysis. Clearly, cyclical stocks have exhibited a much higher sensitivity to changes in monetary conditions than the sensitivity demonstrated by defensive stocks. The results are consistent with the view that expansive monetary policy promotes the prospects of all stocks; however, the prospects of cyclical stocks are enhanced to a much higher degree than the prospects of defensive stocks. The opposite result holds for restrictive monetary conditions as cyclicals suffer to a much larger degree than defensive stocks. The divergence in patterns across sectors justifies the emphasis that analysts place on economic and industry analysis, as a systematic link is clearly

demonstrated between return performance and monetary conditions. This evidence suggests that monetary conditions should play a prominent role in any sector or industry rotation strategy.

Cross-Sectional Consistency in Monetary Policy Related Return Patterns – International Returns

Table 6 presents mean returns for a U.S. stock index and five international indices.[17] Since return data for the international indices starts in 1973, we follow the approach adopted for the sector indices and report results for the final thirteen monetary periods (9 – 21).

Consistent with our prior evidence, we find that international stock returns display pronounced patterns linked to U.S. monetary conditions. This is not surprising given the global influence of the U.S. economy. The return differences in Table 6 are economically large, ranging from a high of 22.09% for Asia to a low of 18.47% for the Americas, and are statistically significant for all six indices. The sub-period results again suggest that the return patterns have diminished somewhat in the most recent sub-period. However, all six indices report statistically significant return differences in the full period as well as both sub-periods.[18]

Summary and Conclusions

[17] The six indices are from Thomson Datastream and are value-weighted. The indices are comprised of the largest stocks in each country.

[18] The Table 6 return differences for the U.S. index in the two sub-periods differ slightly from the differences reported in Table 2 (21.32% vs. 21.92% and 14.86% vs. 14.42%). The difference in the results is attributed to the different indexes that were used for the two separate analyses, the CRSP NYSE/AMEX/NASDAQ value-weighted total return index for Table 2 and Thomson Datastream index for Table 6.

This study provides a rigorous evaluation of the relationship between U.S. monetary policy and global security returns. The study provides new analysis and findings that are of significance for analysts and investment managers alike. First, we use daily returns instead of monthly returns to provide a more accurate assessment of an investment strategy based on monetary conditions. Second, we investigate the influence of monetary policy on alternative investing "styles," focusing on several "size" and "value/growth" portfolios. Third, motivated by theoretical considerations, we explore the influence of monetary policy on the returns to several alternative U.S. sectors. Fourth, we extend the analysis using the returns to several international stock indices. Finally, we explore the time-series consistency of all the above relationships, focusing on the question of whether monetary policy has become less important in more recent periods.

Our findings support the following claims. First, monetary conditions have had, and continue to have, a strong relationship with security returns. In particular, periods of expansive monetary policy are associated with strong stock performance (higher than average returns and lower than average risk), while periods of restrictive monetary policy generally coincide with weak stock performance (lower than average returns and higher than average risk). Second, a highly consistent relationship between monetary conditions and stock returns is evident over time. While initial analysis suggests the relationship has diminished, a more thorough investigation indicates that a single monetary period that occurred in the mid-1990s is largely responsible for this conclusion. Third, our findings indicate that small capitalization firms are more sensitive to changes in monetary conditions. Small-cap portfolios have economically and statistically significant monetary-policy-related return patterns that are consistent over time. Fourth, cyclical

stocks have a much higher sensitivity to changes in monetary conditions than defensive stocks. For example, stocks in the Cyclical Consumer Goods, Cyclical Services, and Information Technology sectors had expansive-period returns that were over 26% per year higher than the returns earned during restrictive periods. Finally, the evidence indicates that U.S. monetary policy has an important influence on global markets, as significant return patterns are found for five alternative international stock indexes. This evidence is consistent with the prominent role that U.S. economic conditions play on the prospects of foreign firms.

Overall, our evidence strongly suggests that a thorough economic and industry analysis should devote considerable attention to monetary conditions. The performance of stock markets in the U.S. and foreign countries are shown to be heavily influenced by U.S. monetary conditions. Further, our findings demonstrate that the sensitivity to changes in monetary conditions deviates considerably across sectors, which advocates performing a rigorous industry analysis. Our findings clearly indicate that investment professionals attempting to develop a successful sector or industry rotation strategy should monitor changes in monetary conditions when selecting sector allocations.

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