Received 5 September 2014
Revised 28 October 2014
Accepted 8 January 2015

Stock returns and the US dollar: the importance of monetary policy

J. Christopher Hughen
Daniels College of Business, University of Denver, Denver, Colorado, USA, and
Scott B. Beyer
College of Business, University of Wisconsin Oshkosh, Oshkosh, Wisconsin, USA

Abstract

Purpose – In the increasingly globalized economy, foreign exchange fluctuations have multiple, conflicting effects on domestic stock prices. The purpose of this paper is to examine return data to determine the relation between the dollar's value and stock prices as it relates to monetary policy.

Design/methodology/approach – The authors examine US stock returns over a 40-year period, which is classified according to monetary policy and dollar trend. To better understand the impact of foreign exchange fluctuations, the authors estimate a model of stock returns using the three Fama-French factors and a momentum factor. Then the authors explore the underlying economic fundamentals that drive the sharp difference in annual returns between periods when the dollar is in an uptrend trend with loose monetary policy and periods when the dollar is in a downtrend with tight monetary policy.

Findings – Over the last 40 years, US stock returns were 2.5 times higher when the dollar was trending up vs down. The factor model of returns shows that equity returns are positively associated with periods when the dollar appreciated. Returns were particularly high when the dollar was in an uptrend during accommodative monetary policy. During these periods, stocks in the consumer goods and services industries provided relatively high returns. This occurred with strong economic growth due to consumer spending. Stocks exhibited the lowest returns when the dollar was depreciating and the Federal Reserve was tightening.

Originality/value – The key contribution of the research is that currency trends should be analyzed in the light of monetary policy. During periods of accommodative monetary policy and dollar appreciation, the US stock market provided average returns of 18.7 percent compared to –3.29 percent during a period of restrictive monetary policy and dollar depreciation. This result is driven by stronger economic growth, which is composed of consumer spending that more than offsets the dollar's impact on net exports.

Keywords Growth, Monetary policy, Stock returns, Foreign exchange

Paper type Research paper

Introduction

In a stagnant global economic environment, countries may pursue competitive currency devaluations (a.k.a. currency wars) to stimulate growth. The Japanese economy provides an example of how devaluations can impact the stock market. Starting in November 2012, the Japanese Yen depreciated 17 percent over four months while the Nikkei 225 index increased by 42 percent. Does this mean that a weak currency benefits the local stock market?

The exposure puzzle is the failure of prior studies to consistently find a strong relation between individual stock returns and exchange rate changes. Currency devaluation does benefit some companies. A weak dollar increases exports and allows foreign investors to buy domestic securities at lower prices. When the risk trade is "on," investors sell US dollars while buying more risky stocks. On the other hand, a weak dollar will decrease the profit margins of companies that purchase inputs in foreign currency and sell products domestically.

JEL Classification — F31, G11, G12, G15

Managerial Finance
Vol. 41 No. 10, 2015
pp. 1046-1058

0307-4358
DOI 10.1108/MF-09-2014-0234

To better understand the impact of foreign exchange fluctuations, we estimate a model of stock returns using the three Fama-French factors and a momentum factor. Even after adjusting for these risk factors, US stock returns are positively related to currency values. Over a period of 40 years the stock market provided an average annual return of 14.86 percent when the dollar was in an uptrend but only 5.73 percent when the dollar was in a downtrend. Our primary insight is that dollar trends should be analyzed in the light of monetary policy. Stocks gained 18.70 percent annually when the dollar appreciated under a loose monetary policy. Equity investments should be avoided when the dollar is depreciating under a restrictive monetary policy as average returns are −3.29 percent during such periods.

Estimating currency exposure

To evaluate a stock's sensitivity to exchange rate changes, investors need financial data that quantifies currency exposure. US GAAP provide guidelines for the financial reporting on a company's segments[1]. An operating segment is reportable if revenues, assets, or absolute value of profits are 10 percent of the total amounts for the company. While these segments can be defined geographically and indicate currency exposure, companies often define these segments by product line or industry. Even companies with significant international operations may not release financial data on their foreign segments in a manner that allows investors to accurately measure their exposure to exchange rate fluctuations.

Estimating currency exposure is also complicated since exchange rate fluctuations have multiple effects on domestic stock prices. First, changes in the value of the dollar influence the foreign currency price of US products. While about half of the companies in the S&P 500 Index do not provide foreign sales data, information from reporting firms indicate that 46 percent of sales are foreign (Silverblatt, 2012). Second, the value of the dollar affects input prices. Domestic companies that use significant amounts of foreign materials in producing their products are affected by changes in currency values.

Third, foreign exchange fluctuations affect the dollar value of foreign assets. At the end of 2012, non-financial US companies held 60 percent of their cash ($840 billion) outside of the USA. As the dollar depreciates, the value of these foreign assets increases in dollar terms. The depreciation of the dollar greatly impacts many multinational companies that minimize corporate taxes by avoiding the repatriation of profits to the USA. The corporate tax rate in this country is the highest of any developed nation. However, profits that originate in another country are not taxed by the US federal government until the profits are returned to the USA.

Research on currency risk

The level of currency exposure associated with stocks has been a source of controversy among academics. Earlier studies surprisingly fail to find that the stocks of multinational companies are affected by their currency exposure (Bodnar and Wong, 2003; Griffin and Stulz, 2001; He and Ng, 1998). Bartram *et al.* (2010) explain this exposure puzzle by documenting that companies use operational hedges and financial strategies to reduce exchange rate sensitivity to low levels.

Later studies, on the other hand, document that stock prices do reflect currency risk. Pritamani *et al.* (2004) suggest that the seemingly insignificant exposure of exporters is due to the offsetting effects of a change in the exchange rate. Their study reveals

currency exposure for both importers and exporters through calculating residual returns using an equally weighted index instead of a value-weighted index, which is dominated by large multinational firms. Aggarwal and Harper (2010) also document currency exposure in domestic firms with minimal foreign assets and foreign sales. They conclude that these companies have exchange rate exposure arising from foreign competition whose activity is influenced by exchange rate changes.

Our study provides unique findings on the exposure puzzle by relating overall market and sector returns to major trends in the US dollar. We provide additional insight by examining currency trends in conjunction with monetary policy. Our insight is motivated by extensive literature documenting higher equity returns during expansive monetary policy (Jensen and Johnson, 1995; Jensen *et al.*, 1996; Booth and Booth, 1997).

Hypotheses

In addition to the exposure puzzle identified by the academic literature, the popular media offers differing accounts of the relation between the dollar's value and stock prices. A report by NPR declared: "The stock market goes down, the dollar goes up. And when the dollar goes down, don't be surprised to see the markets going up" (Gjelten, 2009). In contrast, an article in *The New York Times* stated, "[f]rom a purely statistical point of view, there has been a very weak historical correlation between fluctuations in the dollar and the stock market's ups and downs" (Hulbert, 2006). These conflicting accounts motivate our first hypothesis:

H1. Stock returns are higher when the currency is appreciating.

Currency values are related to interest rates through the international Fisher effect, which shows how the interest rate differential between two countries affects the expected change in the exchange rate (Madura, 2014). When the interest rate in a country declines due to lower inflation, the international Fisher effect implies that country's currency will appreciate. These macroeconomic conditions are likely to exist during an accommodative monetary policy. As a lower interest rate and inflation are positive for stocks, we formulate the following second hypothesis:

H2. Stock returns are relatively high when the currency value appreciates and monetary policy is loose.

By examining this hypothesis, our study connects the theory on international finance with the research on monetary policy and stock returns.

Economic growth can also result in a currency appreciation as global investors have higher demand for assets in expanding economies. Since personal consumption expenditures represent over 60 percent of GDP, we examine the following third hypothesis:

H3. Stock returns for consumer goods and services industries are relatively high when the currency value appreciates and monetary policy is loose.

When accommodative monetary policy boosts economic growth without affecting inflation, the currency will tend to appreciate and consumer stocks should outperform.

Data and methodology

We examine US stock returns over the 40-year period from January 1973 to January 2013. Our analysis starts when the Federal Reserve created the US Dollar Index in 1973. The US federal government ended the convertibility of the dollar into gold in 1971, and

the value of many major currencies started free floating at this time. We use the Real-Trade Weighted US Dollar Index: Major Currencies. These major currencies are the euro, Canadian dollar, Japanese yen, British pound, Swiss franc, Australian dollar, and Swedish krona. This index is computed monthly due to the need for price data from each country, and the weights are determined annually based on trade data.

Stock indexes

We use the Datastream Global Equity Indexes to measure stock returns. The overall market return is represented by the Datastream Total Market Index for the USA. Datastream currently compiles these indexes for 53 countries, and each is a sample of stocks representing at least 75 percent of the market capitalization for that country.

Unlike other index series, Datastream Global Equity Indexes provide sector returns from 1973. Another advantage is that these indexes are formed using the Industry Classification Benchmark (ICB), which was created by Dow Jones and FTSE. The ICB classifies stocks into one of ten industries. This system for categorizing companies is used by stock exchanges with over 65 percent of the global market capitalization[2]. Table I shows the ten industries in the ICB and their component sectors. The market capitalization and number of stocks in each industry is shown as of March 2013. Our analysis uses total index returns that reflect both dividends and price appreciation.

To test our hypotheses, we estimate a model using the three Fama-French factors, which include the market, size (SMB), and book-to-market equity (HML) factors (Fama and French, 1993). We also incorporate the momentum (MOM) factor in the model

Industry	Market cap (billions)	Number of stocks	Component sectors
Oil and gas	$1,934	102	Oil and gas producers; oil equipment, services and distribution; alternative energy
Basic materials	$529	49	Chemicals; forestry and paper; industrial metals and mining; mining
Industrials	$2,037	169	Construction and materials; aerospace and defense; general industries; electronic and electrical equipment; industrial engineering; industrial transportation; support services
Consumer goods	$1,792	97	Automobiles and parts; beverages; food producers; household goods and home construction; leisure goods; personal goods; tobacco
Health care	$1,767	80	Health care equipment and services; pharmaceuticals and biotechnology
Telecom	$436	13	Fixed line telecom; mobile telecom
Utilities	$562	49	Electricity; gas, water and multiutilities
Financials	$2,973	195	Banks; non-life insurance; life insurance; real estate investment and services; real estate investment trusts; financial services; equity investment instruments; non-equity investment instruments
Technology	$2,464	103	Software and computer services; technology hardware and equipment
Consumer services	$2,304	139	Food and drug retailers; general retailers; media; travel and leisure

Notes: The ICB is owned by FTSE and is described at www.icbenchmark.com. The market capitalization and number of equities in each industry is for March 2013

Table I. Industry Classification Benchmark (ICB) used in Datastream Equity Indexes

(Jegadeesh and Titman, 1993). The historical data for these factors is downloaded from Kenneth French's web site. The factors are created using the Center for Research in Security Prices (CRSP) database and the one-month Treasury bill rate.

Monetary policy

As part of their role in setting monetary policy, the Board of Governors of the Federal Reserve System determines the discount rate, which is the interest rate at which financial institutions can borrow money from the Federal Reserve. Such loans are typically short term in nature and used in times of financial crisis to provide liquidity. Financial institutions do not heavily rely on the "discount window" to get funds, but the discount rate serves as an important signal of the direction of monetary policy. A restrictive policy is in effect when the Federal Reserve is decreasing the money supply, hiking interest rates, or attempting to slow economic growth. The Federal Reserve adopts an expansive monetary policy when they want to encourage economic growth. This is usually signaled by an increase in the money supply or cuts in interest rates.

The discount rate is one of the most visible signals of the direction of monetary policy. Jensen and Johnson (1995), Jensen *et al.* (1996), Booth and Booth (1997), Prather and Bertin (1997), Jensen *et al.* (2000), and Beyer *et al.* (2004) support the importance and use of the discount rate to classify monetary policy. In our analysis, we use a simple system to classify monetary policy. An expansive or accommodative period of monetary policy begins with a decrease in the discount rate and ends when the Federal Reserve increases the discount rate. A restrictive period of monetary policy starts when the discount rate increases and ends with a cut in the discount rate.

In the 40-year period analyzed in this paper, we identify 18 different periods of monetary policy. Table II shows the beginning date and length of each period.

Monetary policy	Policy beginning	Length (years)	Rate changes	Discount rate at start (%)	Discount rate at end (%)
Expansive	11/19/1971	1.2	2	4.80	4.50
Restrictive	1/15/1973	1.9	8	5.00	8.00
Expansive	12/9/1974	2.7	7	7.80	5.30
Restrictive	8/30/1977	2.7	14	5.80	13.00
Expansive	5/29/1980	0.3	3	12.00	10.00
Restrictive	9/26/1980	1.1	4	11.00	14.00
Expansive	11/2/1981	2.4	9	13.00	8.50
Restrictive	4/9/1984	0.6	1	9.00	9.00
Expansive	11/21/1984	2.8	7	8.50	5.50
Restrictive	9/4/1987	3.3	3	6.00	7.00
Expansive	12/19/1990	3.4	7	6.50	3.00
Restrictive	5/17/1994	1.7	4	3.50	5.30
Expansive	1/31/1996	3.6	3	5.00	4.50
Restrictive	8/24/1999	1.4	5	4.80	6.00
Expansive	1/3/2001	3.5	14	5.80	2.00
Restrictive	6/30/2004	3.1	17	2.25	6.25
Expansive	8/17/2007	2.5	12	5.75	0.50
Restrictive	2/19/2010		1	0.75	

Table II.
Monetary policy changes classified using the discount rate

Notes: This table describes periods of restrictive or expansive monetary policy as determined by changes in the discount rate. Interest rate data are provided by the Board of Governors of the Federal Reserve System through the FRED database

Excluding the last period in the table, the average length of a period is 2.25 years and involves an average of seven changes in the discount rate.

One problem with our approach to measuring monetary policy is that the discount rate cannot be consistently measured over the sample period. As provided on the FRED database through the Federal Reserve Bank of St Louis, the discount rate before 1975 is the rate set by the New York Federal Reserve Bank. The Federal Reserve Board approved new primary and secondary credit programs on October 31, 2002. The changes did not represent a shift in monetary policy or interest rates but did establish a new version of the discount rate. This occurred during an expansive monetary policy regime that started on January 3, 2001.

We start our analysis by developing a classification system for trends in the US dollar. Changes in the Real-Trade Weighted US Dollar Index: Major Currencies of at least 20 percent constitute an up- or down-trend in the currency. In addition, we identify periods of relative stability and classify these as a flat trend. Table III shows the trends in the US dollar since 1973. The average downtrend results in the currency depreciating against other major currencies by 31.5 percent. The average uptrend results in a 54.3 percent appreciation of the dollar relative to other major currencies.

Results

Using the classifications of monetary policy periods and dollar trends, we can examine how these are related to equity returns. This will test our first hypothesis that stock returns are higher when the currency is appreciating.

Stock returns, dollar trends, and monetary policy

Table IV shows annual US stock returns as measured by the Datastream Total Market Index during dollar trends. In general, a depreciating currency is associated with mediocre stock returns as the weighted average return is 5.73 percent. An uptrend in the dollar coincides with a bull market in stocks. The average annual return of stocks is 14.86 percent while the dollar is appreciating. A period of stability in the dollar is also associated with increasing stock values. A period of stability in the dollar is also associated with increasing stock values, and the average annual return in this situation is 10.05 percent. These averages offer a plausible explanation for the conflicting accounts of the effect of currency fluctuations on stock prices. Since stocks provide positive average returns regardless of the dollar trend, many people find it difficult to understand how currency values affect overall equity prices.

Dollar trend	Start date	Start value	End date	End value	Change (%)
Down	1/1/1973	108.3	10/1/1978	82.5	−23.8
Up	10/1/1978	82.5	3/1/1985	131.6	59.5
Down	3/1/1985	131.6	4/1/1988	81.7	−37.9
Flat	4/1/1988	81.7	4/1/1995	78.1	−4.4
Up	4/1/1995	78.1	2/1/2002	116.6	49.3
Down	2/1/2002	116.6	3/1/2008	78.5	−32.7
Flat	3/1/2008	78.5	1/1/2013	83	5.7

Notes: The value of the US dollar is measured using the Real-Trade Weighted US Dollar Index: Major Currencies that is calculated by the Board of Governors of the Federal Reserve System

Table III.
Trends in US dollar since 1973

Dollar trend	Monetary policy	Stock market return (%)
Down	–	5.73
Flat	–	10.05
Up	–	14.86
–	Loose	13.65
–	Tight	5.95
Down	Loose	13.63
Flat	Loose	6.96
Up	Loose	18.70
Down	Tight	−3.29
Flat	Tight	12.72
Up	Tight	9.94

Table IV.
Stock returns by dollar trend and monetary policy

Notes: This table shows annualized US equity returns that are categorized by monetary policy and the trend in the US dollar. We use the Datastream Total Market Index to represent stock market returns

Given the extensive literature on the importance of monetary policy, we examine returns categorized by both the dollar trend and monetary policy. As shown in Table IV, the best time to own stocks is when the US dollar is appreciating during an loose monetary policy. The annual return in the US market is 18.7 percent during such periods. When the dollar is appreciating and monetary policy is tight, the annual return on stocks is 9.94 percent, which is 47 percent less than during loose monetary policy. Stocks exhibit the lowest returns (average annual return of −3.29 percent) when the dollar is depreciating while monetary policy is restrictive. Monetary policy provides great insight into how stock prices react when the dollar is trending.

To determine the robustness of these results to market risk factors, we estimate models of the monthly return on the Datastream Total Market Index minus the risk-free rate. Table V provides the estimated coefficients for four factor models. Model 1 includes the three Fama-French factors (MKTRF, SMB, and HML) and a dummy variable (UP), which indicates whether the dollar is in an uptrend. The UP variable is statistically significant with a p-value of 5.2 percent for a one-sided test. Model 2 also incorporates the momentum factor, and the UP variable is still statistically significant with a p-value of 3.2 percent. This analysis supports our first hypothesis that equity returns are higher when the currency is appreciating.

Our second hypothesis states that equity returns are relatively high when the dollar appreciates while monetary policy is loose. Model 3 in Table V estimates a factor model of equity returns using the three Fama-French factors and a dummy variable (LUP) for months when the dollar is appreciating during accommodative monetary policy. LUP is positive and statistically significant with a p-value of 4.5 percent for a one-sided test. Model 4 includes the momentum factor along with the Fama-French factors. The LUP variable is again positive and statistically significant with a p-value of 3.2 percent. Our analysis supports the conclusion that stock returns are particularly favorable during a dollar uptrend and loose monetary policy. This relation is statistically significant even after adjusting for the major factors associated with returns.

Industry analysis

Table VI shows annualized returns categorized by dollar trend and monetary policy. When the dollar is in a downtrend, the oil and gas and basic materials industries

	Model 1	Model 2	Model 3	Model 4
Intercept	0.0040	0.0044	0.0042	0.0047
	(4.23)	(4.74)	(4.91)	(5.5)
MKTRF	0.9351	0.9270	0.9354	0.9275
	(53.97)	(53.85)	(54.04)	(53.92)
SMB	0.0918	0.1083	0.0947	0.1113
	(3.67)	(4.33)	(3.79)	(4.45)
HML	0.0107	0.0214	0.0088	0.0192
	(0.4)	(0.81)	(0.33)	(0.73)
MOM		−0.0642		−0.0637
		(−3.8)		(−3.77)
UP	0.0026	0.0029		
	(1.63)	(1.85)		
LUP			0.0033	0.0035
			(1.7)	(1.86)

Notes: This table provides coefficient estimates and *t*-statistics in parentheses for a regression analysis of the total monthly return on the Datastream Total Market Index minus the risk-free rate. MKTRF, SMB, HML, and MOM are the three Fama-French and a momentum factor. UP is a dummy variable indicating when the US dollar is in an uptrend. LUP is a dummy variable indicating when monetary policy is loose while the dollar is in an uptrend

Table V.
Regression analysis of market returns

provide the best average returns (14.71 and 12.21 percent, respectively). This is likely due to the dollar depreciation being caused by higher inflation, which increases the revenues for businesses in these industries. The technology and consumer services industries perform poorly in a downtrend, and these industries have weighted average annual returns of 0.60 and 0.87 percent, respectively. Also, financial stocks exhibit relative underperformance (3.95 percent) during this period. As falling interest rates make the dollar less attractive as an investment, the net interest margin of financial institutions shrinks.

During an uptrend in the dollar, stocks in the financial industry provide the best returns with annual performance of 19.41 percent. Potentially, interest rates are increasing during this time, and this widens the margin between the returns on investments and cost of debt for financial institutions. Technology and industrial stocks also perform relatively better than other industries. These companies likely benefit from a lower cost of foreign inputs due to the appreciating dollar.

As discussed earlier, stocks exhibit the lowest returns when the dollar is depreciating while the Federal Reserve is tightening. Table VI shows that stocks in the consumer goods, technology, and consumer services industries all perform relatively poorly with annual returns of −10.05, −8.60, and −10.70 percent, respectively. When the dollar is in an uptrend with loose monetary policy, the consumer goods, technology, and consumer services industries provide high returns (19.86, 29.62, and 22.14 percent, respectively). These industries are particularly sensitive to monetary policy and changes in the dollar's value.

Our third hypothesis states that stocks in the consumer goods and services industries will exhibit relatively high returns when the currency value is appreciating. We examine this hypothesis by estimating models of industry returns using the three Fama-French factors, the momentum factor, and a dummy variable (LUP) for months when the dollar is trending up during accommodative monetary policy[3]. Table VII shows the coefficient estimates and *t*-statistics for these models. For one-sided tests, the

Table VI.
Industry returns by monetary policy and dollar trend

Dollar trend	Monetary policy	Oil and gas (%)	Basic materials (%)	Industrials (%)	Consumer goods (%)	Industry Health care (%)	Telecom (%)	Utilities (%)	Financials (%)	Tech (%)	Consumer services (%)
Down	–	14.71	12.21	5.99	5.35	5.30	8.07	8.92	3.95	0.60	0.87
Flat	–	6.77	7.30	9.69	9.26	13.60	10.66	7.94	7.67	12.27	12.30
Up	–	13.51	9.28	16.85	10.04	16.25	10.92	12.33	19.41	16.32	15.78
–	Loose	12.51	14.52	14.85	18.40	13.28	8.72	8.84	13.11	17.43	15.18
–	Tight	11.23	4.62	5.96	−2.59	9.06	10.97	10.78	6.53	0.27	2.39
Down	Loose	19.73	20.44	14.48	19.70	13.68	9.48	14.53	11.39	8.70	11.31
Flat	Loose	−0.04	6.79	6.97	14.46	6.55	4.03	2.21	7.78	15.03	11.76
Up	Loose	14.41	13.96	21.25	19.86	17.90	11.36	7.69	19.06	29.62	22.14
Down	Tight	8.78	2.79	−3.66	−10.05	−4.21	6.34	2.36	−4.57	−8.60	−10.70
Flat	Tight	12.86	7.73	12.03	5.06	19.90	16.58	13.01	7.57	9.99	12.75
Up	Tight	12.32	3.33	11.23	−1.82	14.09	10.34	18.83	19.88	0.68	7.82

Notes: This table shows annualized US equity returns that are categorized by monetary policy and the trend in the US dollar. We use the Datastream Global Equity Indexes to represent industry returns

Table VII.
Regression analysis of industry returns

	Oil and gas	Basic materials	Industrials	Consumer goods	Health care	Telecom	Utilities	Financials	Tech	Consumer service
Intercept	0.0063	0.0047	0.0049	0.0028	0.0073	0.0071	0.0050	0.0036	0.0060	0.0043
	(2.63)	(2.19)	(3.34)	(1.56)	(4.37)	(3.36)	(2.71)	(1.99)	(2.78)	(2.93)
MKTRF	0.8197	1.1038	1.0463	0.8631	0.7241	0.7034	0.5714	1.0883	1.0664	0.9785
	(17.00)	(25.84)	(35.30)	(23.66)	(21.56)	(16.63)	(15.32)	(30.25)	(24.38)	(32.83)
SMB	−0.1028	0.1000	−0.0436	0.1485	−0.2889	−0.2765	−0.0922	−0.0555	−0.0859	0.0347
	(−1.47)	(1.61)	(−1.01)	(2.80)	(−5.92)	(−4.50)	(−1.70)	(−1.06)	(−1.35)	(0.80)
HML	0.2141	0.2804	0.0278	0.2468	−0.1327	−0.0285	0.4004	0.3776	−0.5696	−0.1086
	(2.89)	(4.28)	(0.61)	(4.41)	(−2.58)	(−0.44)	(7.00)	(6.84)	(−8.49)	(−2.38)
MOM	0.0481	−0.1265	−0.0989	−0.2175	−0.0284	−0.0939	−0.0046	−0.1814	−0.1322	−0.1251
	(1.02)	(−3.02)	(−3.40)	(−6.08)	(−0.86)	(−2.26)	(−0.13)	(−5.14)	(−3.08)	(−4.28)
LUP	−0.0017	−0.0021	0.0046	0.0071	0.0024	−0.0010	−0.0046	0.0033	0.0142	0.0070
	(−0.32)	(−0.45)	(1.41)	(1.77)	(0.66)	(−0.22)	(−1.11)	(0.83)	(2.94)	(2.13)

Notes: This table provides coefficient estimates and *t*-statistics in parentheses for a regression analysis of the total monthly return on the Datastream Global Equity Index for each industry minus the risk-free rate. MKTRF, SMB, HML, and MOM are the three Fama-French and a momentum factor. LUP is a dummy variable indicating when monetary policy is loose while the dollar is in an uptrend

LUP variable is positive and statistically significant at *p*-values of less than 5 percent for only the consumer goods, technology, and consumer services industries. Our analysis supports the assertion that consumer-related industries are sensitive to both monetary policy and currency trends.

Economic growth

What are the underlying economic fundamentals that drive the sharp difference in annual returns between periods when the dollar is in an uptrend trend with loose monetary policy and periods when the dollar is in a downtrend with tight monetary policy? As shown in Table VIII, the GDP growth rate during the former period is 3.6 percent compared to a growth rate of 2.7 percent for the latter. In other words monetary policy and currency trends are highly correlated with GDP growth rates. What component of GDP is causing the difference? Consumers contribute 1.1 percent more (2.7 percent relative to 1.6 percent) to economic growth in a period with loose policy and a dollar uptrend compared to a period with tight policy and a dollar downtrend. This provides a plausible explanation for substantial difference in average stock returns for the consumer goods and services industries in these periods.

Conclusion

In our globalized economic environment, investors are increasingly concerned with how currency fluctuations impact stock prices. Media reports are often filled with conflicting accounts of the relation between the dollar's value and stock price. Academic studies have not consistently documented a strong relation between equity prices and currency values, and this created the exposure puzzle. Our study takes a novel approach to analyzing this phenomenon by investigating currency trends. Stock returns have historically been 2.5 times greater when the dollar is appreciating. We estimate a factor model of returns and find that the variable for a dollar uptrend is positive and statistically significant.

The key contribution of our research is that currency trends should be analyzed in the light of monetary policy. For the past 40 years, the US stock market provided

			Components of GDP			
Monetary policy	Dollar trend	GDP (%)	C (%)	I (%)	G (%)	X (%)
		2.9	2.0	0.5	0.3	−0.1
Loose	–	3.1	2.4	0.5	0.4	−0.5
Tight	–	2.5	1.7	0.5	0.2	0.1
–	Down	3.0	2.1	0.4	0.4	0.0
–	Flat	2.3	1.5	0.6	0.2	0.0
–	Up	3.3	2.5	0.1	0.6	−0.5
Loose	Down	3.1	2.4	0.4	0.5	−0.4
Loose	Flat	2.1	1.5	0.5	0.3	−0.1
Loose	Up	3.6	2.7	1.2	0.6	−0.8
Tight	Down	2.7	1.6	0.8	0.2	0.2
Tight	Flat	2.4	1.5	0.6	0.0	0.2
Tight	Up	2.8	2.0	−0.1	0.3	−0.2

Table VIII.
Components of GDP by monetary policy and dollar trend

Notes: This table provides the change in the components of US GDP during different monetary policy regimes and trends in the US dollar. The components of GDP are consumption (C), investment (I), government spending (G), and net exports (X)

average returns of 18.7 percent during periods of accommodative monetary policy and dollar appreciation vs –3.29 percent during a period of restrictive monetary policy and dollar depreciation. A variable indicating months in which the dollar was trending up with loose monetary policy is positive and significant in factor models of equity returns. This variable is also significant in return models for the consumer goods and services industries. Stronger economic growth associated with higher consumer spending likely causes this finding.

Notes

1. Accounting Standards Codification Topic 280, which is issued by FASB, describes segment reporting requirements.
2. In addition to being adopted by leading exchanges like NYSE Euronext, Nasdaq OMX, and the London Stock Exchange, the ICB is licensed by the CRSP for indexes and other research offerings.
3. We also estimated the model without the momentum factor, and the results are not materially different.

References

Aggarwal, R. and Harper, J.T. (2010), "Foreign exchange exposure of 'domestic' corporations", *Journal of International Money and Finance*, Vol. 29 No. 8, pp. 1619-1636.

Bartram, S.M., Brown, G.W. and Minton, B.A. (2010), "Resolving the exposure puzzle: the many facets of exchange rate exposure", *Journal of Financial Economics*, Vol. 95 No. 2, pp. 148-173.

Beyer, S., Jensen, G.R. and Johnson, R.R. (2004), "Don't worry about the election – just watch the fed", *The Journal of Portfolio Management*, Vol. 30 No. 4, pp. 101-109.

Bodnar, G.M. and Wong, M.H.F. (2003), "Estimating exchange rate exposures: issues in model structure", *Financial Management*, Vol. 32 No. 1, pp. 35-67.

Booth, J.R. and Booth, L.C. (1997), "Economic factors, monetary policy, and expected returns on stocks and bonds", *Economic Review: Federal Reserve Bank of San Francisco*, No. 2, pp. 32-42.

Fama, E.F. and French, K.R. (1993), "Common risk factors in the returns on stocks and bonds", *Journal of Financial Economics*, Vol. 33 No. 1, pp. 3-56.

Gjelten, T. (2009), "Does a strong dollar help the U.S. economy?", *NPR Morning Edition*, March 6.

Griffin, J.M. and Stulz, R.M. (2001), "International competition and exchange rate shocks: a cross-country industry analysis of stock returns", *Review of Financial Studies*, Vol. 14 No. 1, pp. 215-241.

He, J. and Ng, L.K. (1998), "The foreign exchange exposure of Japanese multinational corporations", *Journal of Finance*, Vol. 53 No. 2, pp. 733-753.

Hulbert, M. (2006), "The dollar may tumble, but it's o.k. to Shrug", *The New York Times*, March 12, p. 10.

Jegadeesh, N. and Titman, S. (1993), "Returns to buying winners and selling losers: implications for stock market efficiency", *Journal of Finance*, Vol. 48 No. 1, pp. 65-91.

Jensen, G.R. and Johnson, R.R. (1995), "Discount rate changes and security returns in the U.S., 1962–1991", *Journal of Banking and Finance*, Vol. 19 No. 1, pp. 79-95.

Jensen, G.R., Johnson, R.R. and Mercer, J.M. (2000), *The Role of Monetary Policy in Investment Management*, The Research Foundation of The CFA Institute, Charlottesville, VA.

Jensen, G.R., Mercer, J.M. and Johnson, R.R. (1996), "Business conditions, monetary policy, and expected security returns", *Journal of Financial Economics*, Vol. 40 No. 2, pp. 213-237.

Madura, J. (2014), *International Financial Management*, 12th ed., Cengage Learning, Stamford, CT.

Prather, L. and Bertin, W. (1997), "A simple and effective trading rule for individual investors", *Financial Services Review*, Vol. 6 No. 4, pp. 285-294.

Pritamani, M.D., Shome, D.K. and Singal, V. (2004), "Foreign exchange exposure of exporting and importing firms", *Journal of Banking and Finance*, Vol. 28 No. 7, pp. 1697-1710.

Silverblatt, H. (2012), "S&P 500®: Global Sales." S&P Dow Jones Indices, August, available at: https://us.spindices.com/documents/research/sp500-global-sales-2011.pdf (accessed November 2012).

Further reading

Industry Classification Benchmark (2014), available at: www.icbenchmark.com (accessed March 2014).

Corresponding author

Dr J. Christopher Hughen can be contacted at: chris.hughen@du.edu