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US International Equity Investment and Economic Fundamentals

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Abstract

Applying portfolio-based techniques to US foreign equity portfolio holdings, this paper studies the global investment behaviour of US investors. Taking wealth effects into account, we analyse active allocation decisions of investors. Using an updated data set by Bertaut and Tryon (2007) and Bertaut and Judson (2014), our results show that there is a negative link between US investor behaviour and lagged economic fundamentals and country risk indicators. This behaviour is, however, less pronounced during risk off episodes. Our study aims to provide a deeper understanding of US investors behaviour in foreign equity markets.

JEL-Classification: G11, G15, F21, F30

Keywords: Portfolio Rebalancing, Momentum, Equity portfolios, Capital Flows.

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1 Introduction

International capital movements play a crucial role in the global economy. Capital flows are linked to countries' economic conditions and influence macroeconomic policies. Strong movements in international portfolio flows have raised questions about the role of international investors' behaviour in the transmission of shocks (i.e. Jotikasthira et al., 2012; Kroencke et al., 2015). The amount of capital intermediated by advanced economies has increased remarkably during the last years (Shin, 2014). Hence, in the aftermath of the financial crisis these dynamics have triggered a growing interest in international macrofinance literature on gross capital flows and international portfolio allocation. A recent strand of literature following Curcuru et al. (2011) studies investors behaviour with portfolio-based techniques. They stress that a flow data analysis in the presence of external wealth effects, does not measure necessarily asset demand.

The aim of this paper is to explain the linkage between US foreign equity portfolio reallocation and economic fundamentals. Taking wealth effects into account, this paper measures the degree to which US investors shift their portfolios in direction of expected macro fundamentals. As US investors manage a substantial part of global financial assets their behaviour is likely to have an impact on the local financial market sentiment. That is why a broader knowledge of US investor behaviour is of interest for policy makers. To our knowledge no comparable study with the dataset of Bertaut and Tryon (2007) and Bertaut and Judson (2014) has been conducted yet.

The paper proceeds as follows. In the next section we discuss the related literature and how this paper adds to the existing research. In Section 3 and 4 we describe the data and methodology used to analyse the relationship between US investment and fundamentals. In Section 5 we discuss the results and finally, in Section 6 we conclude.

2 Related Literature on Capital Flows and Contribution

The overall literature studying (net or gross) capital flow movements is extensive. One branch of academic literature studies drivers of flows to emerging markets. Since the 1990s the literature differentiate between push (global) and pull (domestic) factors for capital flows. In terms of domestic drivers, they finds supporting evidence that economic performance, e.g. economic growth may be a determinant of portfolio flows (see Baek, 2006; Ahmed and Zlate, 2014; Ananchotikul and Zhang, 2014)¹. The evidence is, however, not statistically robust, particularly for higher frequency data (e.g. weekly funds data).

However, it is not always possible to fit factors driving flows into either the push or pull category. Another important related string of literature focuses on the international investors' behaviour towards local markets developments. This literature aims to analyse the extent to which investors rebalance their foreign portfolios to previous or expected price movements (i.e. Bohn and Tesar, 1996)². As fluctuations in flows may not measure shifts in the portfolio allocation, they may be subject to a change in investor's wealth for an exogenous reason and hence do not necessarily result in a change in portfolio weights. Curcuru et al. (2011) take those wealth effects into account. In contrast to previous work, their portfolio-based approach (momentum measure) gives evidence that investors do not chase past returns but future expected returns³. In order to test whether US investors portfolio reallocations respond to US monetary policy, Kroencke et al. (2015) relate investors' behaviour to US macro variables and to FOMC events. Applying portfolio-based techniques (see e.g. Grinblatt et al., 1995), they build portfolio weights adjusted for wealth effects. In contrast to Curcuru et al. (2011), their findings give evidence of a return chasing behaviour. Recent work by Beber et al. (2014) and Baele et al. (2014) investigates the portfolio rebalancing effects in response to a change in investors' risk preferences. They, however, focus price movements rather than on flows.

Our paper departs from previous research by combining different strands of literature. It studies the degree to which investors' trading strategy is related to different domestic macroeconomic forecasts. As in Curcuru et al. (2011), our analysis borrows from the asset pricing literature in the methodology section, but extends the existing international finance literature on equity portfolio flows.

¹For an overview of the push and pull literature refer to Koepke (2015).

²The investment strategy when investors buy stocks that performed well in the previous periods and sell stocks which performed poorly, is called momentum trading.

³Hau and Rey (2006) provides a possible explanation for a contrarian trader given portfolio rebalancing as key argument of the uncovered equity parity (UEP).

3 Data

3.1 US investor portfolio holdings

Our source of equity portfolio holdings are the monthly estimates in U.S. holdings of foreign securities provided by the Federal Reserve Board in billions of US dollars. As in Curcuru et al. (2011) We use the Bertaut and Tryon (2007) (BT) monthly data set on bilateral positions of US investors in the equities for more than 80 foreign countries from March 1994 to December 2011. Bertaut and Judson (2014) (BJ) provide the remaining observations for the period January 2012 to December 2014⁴. Unlike data on fund investment flows, BT and BJ-data provide an aggregated view of the US portfolio equity investment related to bilateral TIC (Treasury International Capital) flows but corrected for financial center bias. The data set by BT and BJ is consistent with the US holdings of foreign equities published in the US Treasury annual benchmark survey and in BEA's US international investment position presentation. Also, it is consistent with the data set provided by the Coordinated Portfolio Investment Survey (CPIS) and the one by Lane and Milesi-Ferretti (2007)⁵. For detailed information about the portfolio data refer to the papers by Bertaut and Tryon (2007) and Bertaut and Judson (2014).

The majority of capital flows takes place between advanced economies. Figure 1 shows the largest contributors in per cent to our US foreign portfolio equity holdings. Especially, the US foreign investment into UK and Japan are worth mentioning. The UK holdings rose up to nearly 30 per cent in the early 2000.

3.2 MSCI returns

The returns are not available for the Bertaut and Tryon (2007) and Bertaut and Judson (2014) portfolio equity holdings data. They are therefore approximated with MSCI country indices. As mentioned by Curcuru et al. (2011), MSCI firms represent almost 80 percent of US investors' foreign equity investment. We collect end of month total return indices in US Dollars for each country. Country-level returns are denoted as $r_{i,t}$ and foreign portfolio returns $r_{p,t}$. US investors' foreign portfolio returns are calculated from an equally weighted portfolio for each country i as

⁴We use the US equity holdings named as TIC data claims for stock estimated positions. The data set is available under: <http://www.federalreserve.gov/pubs/ifdp/2014/1113/default.htm>

⁵The annual database by Lane and Milesi-Ferretti (2007) has been extended to 2011.

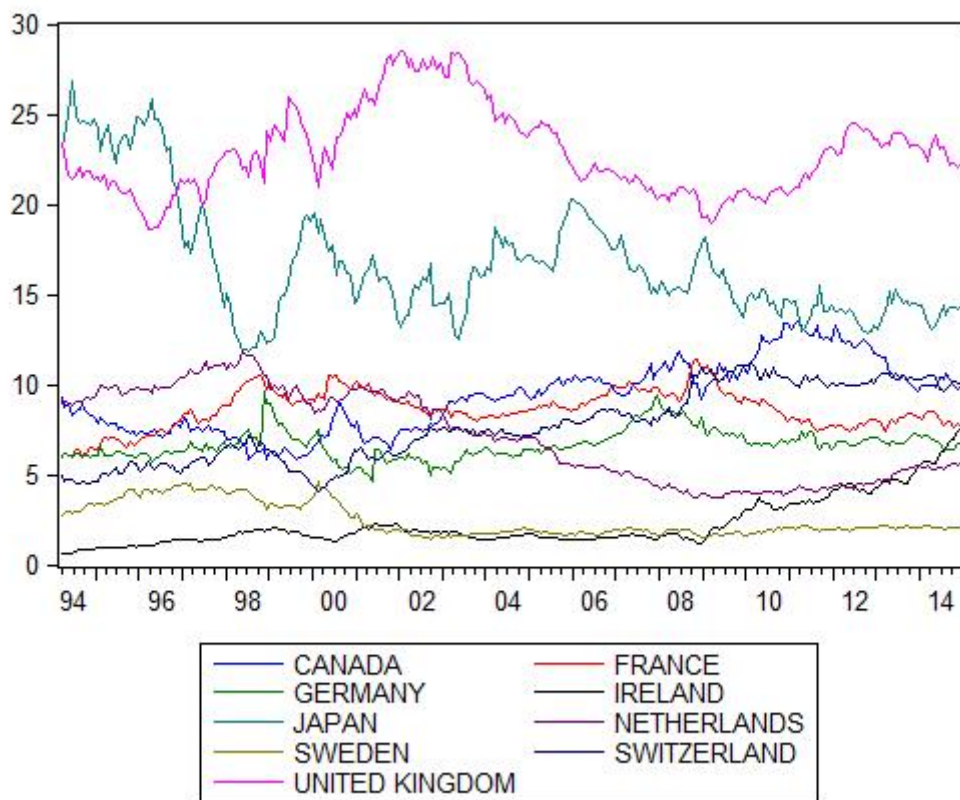


Figure 1: Foreign US Portfolio holdings in percent (Data source: Bertaut and Tryon (2007) and Bertaut and Judson (2014))

$$r_{p,t} = \sum_{i=1}^{N_t} w_{i,t} r_{i,t}.$$

3.3 Survey forecasts

To proxy investors' expectation on fundamentals, we obtain economic survey forecasts at monthly frequency. The forecasts cover a period from January 1990 to December 2014 but the availability of the variables varies across time and countries. We collect data on fundamental variables for European countries as Austria (OE), Germany (DE), France (FR), United Kingdom (UK), Italy (IT), Netherlands (NL), Norway (NO), Spain (ES), Sweden (SW), Switzerland (CH), Belgium (BE), Denmark (DK), Finland (FL), Greece (GR) and Portugal (PT). The set also covers Japan (JP), Canada (CA), Israel (IL), and South Africa (SA).

The variables include: real change in consumer prices, GDP growth, personal consumption, investment and industrial production. These surveys cover the expectations of the given year. All variables are constructed such that increases in the forecasts are positively related to economic growth. We use survey expectation of fundamentals, rather than realised variables as many variables such as the GDP rate are published quarterly on a basis and with a delay. Forecasts that provide higher frequency data may therefore be more reliable in providing information to the forward looking investors.

3.4 Country risk

Concerning the country risk of a foreign country, besides the existing macro survey forecasts, we proxy it by the sovereign credit default swap (CDS) premium. The sovereign default represents the default of the country's banks, since both credit events are highly correlated due to the close financial interactions between the two types of agents. Credit default swaps aim hedging default risk, therefore its premium serves as a good proxy for the default risk. We collect the 5-year sovereign CDS premia from Datastream. We choose a 5-year horizon as these are the most typical maturity and often used in the academic literature. The forecasts cover a period from January 2003 to December 2014 but the availability of the variables varies across time and countries. The advantages of this dataset over the macro forecast is that it also covers some emerging markets data. We collect data on fundamental variables for European countries as Austria (OE), Australia (AU), Belgium (BE), Brazil (BR), Chile (CL), China (CN) Czech Republic (CZ), Germany (DE), Spain (ES), Finland (FN), France (FR), United Kingdom (UK), Greece (GR), Hungary (HU), Ireland (IR), Israel (IL), Italy (IT), Japan (JP), Korea (KO),

Mexico (MX), Netherlands (NL), Norway, Poland (PO), Portugal (PT), Russia (RU), Sweden (SW), Turkey (TU), South Africa (SA).

4 Methodology

This section presents approaches to test if investors employ a momentum trading strategies. We amend the existing methodology to examine our main research question whether US international investors employ trading strategies in response to lagged fundamental variables.

4.1 Momentum trading

The term momentum trading refers to the systematic purchase of equity which has performed well, and the sale of such equity which has performed poorly. The literature on momentum trading can be divided into an asset pricing section and an international finance part. The latter, describing the link between returns and international capital flows, is mentioned in the section 2.

Following the seminal paper by ?, the asset-pricing related literature finds that buying past winners and selling past losers generates significant returns over three to 12-month holding periods. Bondt and Thaler (1985) give evidence for a reversal effect, in which losers rebound and winners fade back. The equity market seem to overreact to news, and as soon the overreaction is recognised, the reaction well be reversed. This strategy is known as contrarian or negative feedback trading and visible at long horizon for three to five years.

In terms of the research question, our paper is more related to the international finance literature as it is concerned about the international capital flows rather than performance of the investors portfolios. However, we rely on the measurements implemented by the asset pricing literature.

4.2 Measuring momentum trading

The methodology in this paper is related to portfolio-based techniques to address the relationship between international investment and fundamentals. As in Grinblatt et al. (1995), Curcuru et al. (2011), and Curcuru et al. (2014), and Kroencke et al. (2015) momentum statistics are used to measure the degree to which the US investors actively change their portfolio holdings. The statistics are computed as follows. First, wealth-weighted portfolio reallocations $X_{i,t}$ are calculated. The US equity holdings by BT and BJ provide the weights w for each country

i. Country-level $r_{i,t}$ are approximated with MSCI country indices. $X_{i,t}$ represents the active change in the portfolio weights for each country's i equity position in the presence of wealth effects.

$$X_{i,t} = w_{i,t} - w_{i,t-1} \left(\frac{1 + r_{i,t}}{1 + r_{p,t}} \right) \quad (1)$$

Second, a cross-section analysis developed by Grinblatt et al. (1995) provides the momentum measures:

$$LM_k = \frac{1}{T} \sum_{t=1}^T \sum_{i=1}^{N_t} X_{i,t}(r_{i,t:t-k}) \quad (2)$$

where N_t is the number of countries held in the portfolio at time t and k refers to the number of periods the returns are lagged. A significant positive value of LM provides evidence of a momentum trading strategy, whereas a negative value is a sign of contrarian trading.

We first test whether US investors in our sample on average buy (sell) those equities that previously performed well (badly) as in equation 2. Next, we also tests whether the US investors on average adjust their foreign equity portfolios to expectations of lagged fundamental variables f . We use expectation of fundamentals as they are available at higher frequency. Moreover, Koijen et al. (2014) show that stock market investors raise their expectation about future international equity returns in response to high past returns. Dahlquist and Hasseltoft (2015) provide similar findings for fundamentals. The momentum measure hence resembles:

$$LM = \frac{1}{T} \sum_{t=1}^T \sum_{i=1}^{N_t} X_{i,t}(f_{i,t-1}) \quad (3)$$

where N_t is the number of countries held in the portfolio at time t and k refers to the number of periods the fundamental variables are lagged. The choice of k is motivated by the seminal paper of Jegadeesh and Titman (1993) who form momentum portfolios after conditioning on three-, six-, nine-, and 12-month lagged returns⁶. We compute heteroscedasticity and autocorrelation robust GMM standard errors⁷. The LM statistics summarises both purchase and selling trading activities. If investors were to act differently in response to past well performing variables in contrast to past losers, we follow the previous literature and compute separate

⁶We do not set k to zero, as in that case one we cannot distinguish it is impossible to distinguish between momentum trading and price pressure (price reacting to reallocation).

⁷The LM statistics were calculated using the MATLAB procedure provided by Kroencke et al. (2015). The code was amended to calculate BM and SM statistics in the same manner.

measure for buys (BM) and sells (SM). The BM statistics investigate the investors' behaviour when they increased country weights.

$$BM_k = \frac{1}{T} \sum_{t=1}^T \sum_{i=1}^{N_t} \sum_{X_{i,t} \geq 0} X_{i,t}(f_{i,t-1}) \quad (4)$$

The SM measure will indicate whether momentum trading is evident when investors decrease country weights.

$$SM_k = \frac{1}{T} \sum_{t=1}^T \sum_{i=1}^{N_t} \sum_{X_{i,t} \leq 0} X_{i,t}(f_{i,t-1}) \quad (5)$$

To test for different investment horizons, we also cumulated the wealth-weighted portfolio reallocation measure X over 3 months.

4.3 Investment behaviour during risk-off periods

The literature has made important implications on the cyclical nature of flows (Fratzscher, 2012). To identify risk-off periods, we rely on the methodology applied by Bock and de Carvalho Filho (2015) and de Carvalho Filho (2015). We identify risk-off periods as months when the VIX⁸ increased 10 percent to its 60 day moving average. We label those months as risk-off in which more than roughly half of their business days show higher stock market volatility defined as by Bock and de Carvalho Filho (2015). Under this definition, we marked the months listed in Table 1 as risk-off episodes. The months can be easily related to specific events in the latest history of financial market turmoils. Next, similar to Kaminsky et al. (2004) we address whether US investors' strategies differ across crisis periods and rerun the tests with this reduced sample.

5 Results

First, we tested for classic momentum trading similar to the Curcuru et al. (2011). The results are reported in tables 2. In table 2 we test for momentum trading with MSCI lagged one, three, six, nine and twelve-month cumulative returns. Recall that we updated the data set to the end of 2014 and therefore we cover a reasonable amount of recent dynamics in the financial markets. At the first lag, the findings differ from those by Curcuru et al. (2011) but support

⁸The VIX is derived from options prices on the S&P 500 index, and is often referred to as a proxy for global risk aversion. The VIX is often given a broader interpretation, as it is highly correlated with broader measures of financial stress and with bond market indicators, including spreads on sovereign bonds of emerging market countries.

Table 1: Risk off episodes from 1994 to 2014

Date	Event
03-04/1994	Bond market turbulence
10-11/1994	Bond market turbulence
10/1995	US government budget crisis
02-03/1996	US government budget crisis
08 and 11/1997	Escalation of Asian crisis
08 -09/1998	Concerns over Russian economy
10-11/2000	Fear of slowing US economy
09 -10/2001	9/11 attacks in New York
06-07/2002	Fear of slowing US economy
04, 10/2005	Fear of slowing US economy
05-06/2006	Fear of slowing US economy
03/2007	Chinese stock bubble
07/-08/2007	Start of the global financial crisis (BNP Paribas)
11/2007	Disruptions in US interbank markets
07- 11/2008	Failure of Lehman and disruption in interbank markets
05-06/2010	European Sovereign debt crisis (Greece)
03/2011	Earthquake in Japan
08-09/2011	Uncertainty over euro crisis, US debt ceiling
05/2012	Deterioration of the Greek debt crisis
06/2013	Taper tantrum

the view reported in the earlier momentum-literature. Early empirical studies find evidence of negative long-term serial correlation in the performance of aggregates markets. Whereas the so-called momentum effect in stock market prices works for short- to intermediate-horizon as found by Jegadeesh and Titman (1993), Bondt and Thaler (1985) give evidence for a reversal effect, in which losers rebound and winners fade back. The equity market seem to overreact to news, and as soon the overreaction is recognised, the reaction well be reversed. This is called the contrarian trading. Both LM and SM statistic turn negative. The reason why our results contradicts findings provided by Curcuru et al. (2011) is that we (i) take a different sample periods with a smaller set of countries and (ii) that we test for a different hypothesis. Following Kroencke et al. (2015) we test for momentum trading scaled by lagged returns.

A LM statistics of 0.24 at $k = 1$ suggests that investors would have earned an additional 0.24 per cent (per month) return on their wealth portfolio, if they had they performed the new portfolio allocation one month earlier.

The second set of results investigates to our main question: is there a link between US investor behaviour and economic fundamentals? The test results in table ?? indicates that there

Table 2: Relation between Reallocations X_i and lagged returns r_i

	Number of lags k				
	1	3	6	9	12
LM in %	0.248 (1.90)	-0.059 (-0.70)	-0.043 (-0.64)	-0.095 (-1.59)	-0.109 (-1.94)
BM in %	0.288 (0.79)	-0.002 (0.00)	0.094 (0.26)	0.109 (0.31)	0.128 (-1.1)
SM in %	-0.040 (-0.10)	-0.057 (-0.16)	-0.136 (-0.43)	-0.204 (-0.68)	-0.238 (0.86)

Notes: The LM statistics is computed as $LM_{k;s} = \frac{1}{T} \sum_{t=1}^T \sum_{i=1}^{N_t} X_{i,t}(r_{i,t:t-k})$ The BM, and SM statistics are defined in the text where we provide additional information about the data. The sample is monthly from 1994/03 to 2014/12. The sample spans 250 observations and covers 20 countries as described in subsection 3.3. GMM t-statistics are in parentheses.

is relationship between US portfolio reallocation and fundamental variables. In first column of the table, the wealth-weighted reallocation measure X is scaled by the monthly economic forecast variables lagged by one month. The negative LM statistics indicates that US investors on average decreased the weights on countries in response to a positive economic outlook. The findings remains basically the same when with increased investment horizon of one quarter. The results indicate that US equity investors on average decreases weights on countries whose expectations of fundamentals have appeared positive. We rerun the tests and only include risk-off months as defined in ???. We only provide the results for GDP growth, change in consumer prices and industrial production where there are a sufficient amount of observations and countries. Our intention with this reduced sample is to test whether US investors on average change their trading behaviour during times of stress. For GDP growth and consumer prices the statistics are no longer significant. Only the real change in industrial production shows a large negative number. It is however difficult to interpret these results as the number of observation in the risk-off sample is very small.

In table ?? we test whether US investors portfolio reallocations on average are related to country risk indicators as defined by sovereign CDS returns. The advantages over using CDS is that they provide a larger set of countries, also including emerging market economies. However, our data set is limited to the period between 2003 and 2014. Since there is only a small number of observations, we use only two lags in the momentum test statistics. On both lags, the momentum measure shows negative statistics. On average, US investors decrease their portfolio weight in

Table 3: Relation between Reallocation X_i and lagged fundamentals f_i

		Investment horizon c	
		$c=1$	$c=4$
GDP growth (real), in %	LM %	-0.12 (-2.59)	-0.14 (-2.49)
Personal Consum., (real), in % change	LM %	-0.39 (-2.24)	-0.39 (-2.24)
Investment, (real), in % change	LM %	-0.57 (-2.30)	-0.61 (-1.79)
Consumer prices, (real) % change	LM %	-0.12 (-1.50)	-0.11 (-1.69)
Industrial Prod., (real), in % change	LM %	-0.39 (-1.50)	-0.31 (-1.14)

Notes: In the first column the statistics are computed as follows: $LM_c = \frac{1}{T} \sum_{t=1}^T \sum_{i=1}^{N_t} X_{i,t+c-1}(f_{i,t-1})$. The second column controls for a investment horizon of three months ($c=4$). The sample is monthly from 1994/03 to 2014/12. The entire sample spans over 250 observations and includes 20 countries. GMM t-statistics are in parentheses.

countries with negative CDS returns. This is in line with the push and pull literature⁹.

Table 4: Relation between Reallocations X_i and lagged cds returns cds_i

	Number of lags k	
	1	2
LM in %	-0.289 (-1.76)	-0.176 (-1.78)

Notes: The LM statistics is computed as $LM_k = \frac{1}{T} \sum_{t=1}^T \sum_{i=1}^{N_t} X_{i,t}(cds_{i,t-t-k})$. The sample is monthly from 2003/01 to 2014/12. The sample spans 143 observations and covers 29 countries as described in subsection 3.3. GMM t-statistics are in parentheses.

6 Conclusion

Using US foreign equity portfolio holdings and portfolio-based techniques, we study the global equity reallocation decisions of US investors. Taking wealth effects into account, we address active allocation changes of investors and not flow data. Using an updated dataset by Bertaut

⁹For more information about this branch of literature refer to the survey of Koepke (2015).

and Tryon (2007) and Bertaut and Judson (2014) we find some evidence that US investors chase past returns in the short-run. Our results show that in the long-run US investor behaviour changes to contrarian trading. Moreover, our results show that there is a negative link between US investor behaviour and economic fundamentals and also country risk indicators. We also provide results that this relationship persists with increasing investment horizon. This behaviour is, however, less pronounced during risk off episodes. Overall, our results with a data set up to 2014 provides a deeper understanding of recent US investor behaviour in foreign equity markets. Our analysis of investors' behaviour is informative for policy makers as portfolio reallocations can create strong movements in international flows.

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