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Valuation Effects and Capital Flows

Security Level Evidence from Euro Area Investors *

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Abstract

We use confidential microdata on security holdings of all euro area investors to analyze portfolio rebalancing patterns in response to valuation changes. Our empirical findings provide evidence for "momentum investment" as investors show larger net purchases of securities which experience relatively higher valuation gains. This pattern is stronger for institutional investors (banks, investment funds, and insurance companies and pension funds) than for households or non-financial corporations and particularly pronounced in euro area countries less affected by the recent financial crisis. For securities denominated in foreign currency (i.e. non-euro), momentum investment is significantly stronger and driven by valuation gains from exchange rate dynamics rather than changes in market prices. Our analysis is consistent with a decreasing share of home currency holdings in euro area investors' portfolios, albeit from high levels, driven by rebalancing towards the US dollar and other foreign currencies over the past five years.

Keywords: International Investment Patterns, Capital Flows, Valuation effects, Exchange Rates, Investor Heterogeneity;

JEL Classification: F31, G15, E44

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1 Introduction

Increasing financial integration has become of great importance in international macroeconomics as external assets and liabilities have risen from around 60% of world GDP in 1995 to approximately 200% in 2015 (Lane and Milesi-Ferretti, 2018). This development reflects (1) the accumulation of foreign assets, but also (2) the valuation of these instruments. The growth in cross-border financial integration goes in tandem with an increased role of returns on external portfolios. While ignored in much of the earlier literature, more recent work shows that the importance of valuation changes as determinants of external investment positions has grown tremendously (see e.g. Lane and Milesi-Ferretti (2001, 2007b, 2018, 2007a); Tille (2008); Gourinchas and Rey (2007); Fratzscher et al. (2010)).[1] Many countries experience valuation effects which exceed capital flows in a given period. Hence, the question arises as to how investors react to increasing valuation effects on foreign assets and in particular on those which are denominated in foreign currency. Do they rebalance their portfolios towards constant security weights in order to maintain fixed exposures to certain types of assets? Or do they invest with the momentum to reach for higher returns?

We use sectoral microdata on security holdings and transactions of all euro area investors collected by the European Central Bank (ECB) since 2013 to test these hypotheses.[2] Recent theoretical literature in international economics predicts that investors will repatriate earnings on foreign securities after experiencing excess returns in order to maintain an optimal trade-off between exchange rate exposure and international asset diversification (Camanho et al., 2018; Hau and Rey, 2006). On the other hand, empirical and theoretical work from the finance literature shows that investors often adjust their targets pro-cyclically and buy more of assets that are increasing in value (e.g. Cox (1967) for banks, Bohn and Tesar (1996) for international investment in the US, or Becker and Ivashina (2015) for insurance companies). These investment patterns are better known as "momentum investment", "return chasing", or "reaching for yield".

Our empirical analysis provides evidence for exactly this type of investment behaviour, i.e. "momentum investment". We show that euro area investors buy more (less) of a security when it

[1] For a special focus on exchange rate valuations and currency composition of external assets see Lane and Shambaugh (2010); Benetrix et al. (2015); Corte et al. (2012); Maggiori et al. (2018).

[2] Our dataset does not contain the security holdings and transactions of euro area monetary authorities, i.e. of the Eurosystem consisting of the European Central Bank and the national central banks.

yields a relatively higher (lower) valuation gain. We use a standard international intertemporal capital asset price model (IICAPM) by Bohn and Tesar (1996) to show the intuition for this result. The model predicts that investors will indeed target specific weights for assets in their portfolio. Facing the standard trade-off between mean return and variability, however, they will adjust these weights according to their expectations on the performance of the corresponding asset. This naturally decomposes the investor's decision on net transactions into those (i) to maintain a portfolio of constant security shares and those (ii) triggered by time-varying investment opportunities.

Our results suggest that euro area investors' transactions since 2013 are primarily driven by the latter effect. We further investigate the patterns of momentum investment in a detailed empirical analysis. We find that the overall pattern is significantly stronger for institutional investors (banks, investment funds, and insurance companies and pension funds) compared with retail investors, i.e. non-financial corporates (NFC) and households (HH). Moreover, we observe significantly stronger momentum investment for investors located in euro area countries that were less affected by the recent financial crisis. For non-euro denominated securities, the effect from valuation changes due to exchange rate dynamics strongly dominates the effect from changes in market prices. This is consistent with a decreasing share of home currency holdings in euro area investors' portfolios, driven by rebalancing towards the US dollar and other foreign currencies over the past five years. While the main focus of the paper lies on international investment, we also include domestic securities held by euro area investors. Since we find momentum investment also for euro-denominated assets, we can exclude that investors chase returns only abroad, while investing more conservatively at home.

While the financial globalization of the last two decades resuscitated interest in portfolio balance models (see e.g. Blanchard et al. (2005), Hau and Rey (2006), Bacchetta and van Wincoop (2010), and Gabaix and Maggiori (2015)), the empirical literature on portfolio rebalancing using microdata is rather scarce and limited to specific countries or sectors. For instance, Calvet et al. (2009) use Swedish data to examine portfolio rebalancing of households for which they find that especially educated and wealthy households are likely to sell securities after an increase in prices. Maggiori et al. (2018) use security positions of international mutual funds to show the importance of the currency home bias combined with a strong portfolio shift away from the euro and towards the US dollar since the global financial crisis. Most closely related to our

research are two recent working papers by Camanho et al. (2018) and Ammer et al. (2018). The former use microdata of internationally invested equity funds and show how differential returns on the foreign and domestic segments of their portfolios determine the rebalancing behavior and capital flows. They find that investors repatriate gains on foreign securities after experiencing excess returns in order to maintain an optimal trade-off between exchange rate exposure and international asset diversification.[3] Conversely, Ammer et al. (2018) present empirical evidence that investors shift their portfolio into riskier US corporate bonds in response to low interest rates in their domestic markets. Our findings are in line with Ammer et al. (2018), illustrating investors' appetite for higher returns abroad when domestic assets offer relatively lower returns. We contribute to the literature in several ways: our broad coverage of euro area sectors allows to shed light on sector heterogeneity which we deem especially important due to different degrees of investor sophistication, informational frictions, or varying asset and liability management strategies as well as regulatory constraints. These factors may imply heterogeneous responses across sectors to changes in valuation (Timmer, 2018). As our data are at the security level, we can further decompose valuation changes very precisely into those emanating from exchange rate dynamics or other price effects. Moreover, we analyze heterogeneity across different asset classes (equity compared to debt instruments) as well as across the residence countries of holders and issuers of a given security. By using a micro-econometric approach, we can circumvent the endogeneity often affecting country-level macro-data studies. We argue that movements in the exchange rate are reasonably exogenous to the investment patterns of our unit of observation, i.e. a specific sector of given euro area country. This is in contrast to much of the existing literature that analyzes international investment at the country level, which makes it more likely that capital flows influence the evolution of asset prices and exchange rates. Finally, the granularity of the data enables us to control for country-sector fixed effects as well as for all security-level characteristics that could possibly obscure our analysis.

The rest of the paper is organized as follows: in Section 2, we motivate our research question with a theoretical framework. Our dataset is introduced in Section 3 and we present descriptive evidence on the (international) portfolio rebalancing of euro area investors in Section 4. Section 5 explains our identification strategy, Section 6 presents our estimation results including robust-

[3] This is in line with the broader concept of Uncovered Equity Parity (UEP). It predicts that when foreign equity holdings outperform domestic holdings, domestic investors are exposed to higher relative exchange rate exposure and decide to repatriate some of the foreign equity to decrease exchange rate risk (Cappiello and De Santis (2007); Kim (2011); Curcuru et al. (2014)).

ness exercises, while Section 7 concludes.

2 Conceptual Framework

Before we present extensive empirical evidence from security level data on investment of euro area investors, we present the research question in a theoretical framework. We follow Bohn and Tesar (1996) and Cox et al. (1985) and use a standard international intertemporal capital asset price model (IICAPM) in order to be able to benchmark our empirical results.

We start by defining the investment decisions as transactions T_{at} of asset a in quarter t:[4]

$$T_{at} = w_{at}P_t - (1 + v_{at})(w_{at-1}P_{t-1}) \tag{1}$$

where w_{at} represents the weight of asset a in quarter t of the total portfolio of the investor P_t and v_{at} is the change in the valuation of asset a at the security level.

Mechanically, the value of the portfolio at time t is a function of the return on the portfolio between $t-1$ and t so that we approximate

$$T_{at} = (w_{at} - w_{at-1})P_{t-1} + (\overline{v_t} - v_{at})w_{at-1}P_{t-1} \tag{2}$$

where $\overline{v_t}$ is the average valuation change of the investor's portfolio in time t.

The right hand side of this equation now splits the determinants of investors' transactions of asset a into two components:

1. $(\overline{v_t} - v_{at})w_{at-1}P_{t-1}$: Transactions for the purpose of portfolio rebalancing towards a given portfolio weight. Hence, if capital gains v_{at} exceed the average capital gain on the portfolio $\overline{v_t}$, net sales of security a are required to bring w_{at} back into balance. For the contrary case, if the average valuation gain of the portfolio exceeds the individual gain on asset a, the resulting gains will be distributed across the portfolio, including asset a, leading to net purchases of asset a.

[4]Positive transactions are net purchases while negative transactions are net sales of a security a in quarter t. For simplicity, we drop the index for the holder country usually used in international CAPM models in order to focus on the effects at the security level.

2. $(w_{at} - w_{at-1})P_{t-1}$: Transactions in response to the change of the portfolio weight between $t-1$ and t. If investors would want to increase the weight of a certain security in their portfolio, this would translate to a net buy (sale) of that asset.

It is assumed that euro area investors face a standard trade-off between mean return and variance. According to the framework by Cox et al. (1985), the solution to this problem yields the following first-order condition, linking the valuation of asset a to its corresponding portfolio weight:

$$w_{at} = \alpha e_a \sum_{t}^{-1} \overline{\mu_t} \tag{3}$$

where α represents the coefficient for relative risk aversion, e_a is a 0-1 vector which selects asset a, $\sum_t^{-1} \overline{\mu_t}$ is the covariance matrix of returns.[5]

Therefore, we can substitute equation (3) in our process of interest, namely transactions defined in equation (2):

$$T_{at} = e_a \sum_{t}^{-1} (\overline{\mu_t} - \overline{\mu_{t-1}})\alpha P_{t-1} + (\overline{v_t} - v_{at}) w_{at-1} P_{t-1} \tag{4}$$

Again, this splits the right hand side into two processes which lay out a perfect playground for our empirical analysis:

Portfolio Rebalancing Hypothesis: $(\overline{v_t} - v_{at})w_{at-1}P_{t-1}$ mainly determines active investment.

Investment patterns are characterized by rebalancing towards constant target weights in order to offset excess returns (losses) by net sales (purchases) of that security. This would be in line with the recent work by Camanho et al. (2018). Their model predicts portfolio rebalancing through the repatriation of excess returns on foreign equity securities in order to maintain an optimal trade-off between international asset diversification and exchange rate exposure.[6]

Momentum Investment Hypothesis: $e_a \sum_t^{-1} (\overline{\mu_t} - \overline{\mu_{t-1}})$ mainly determines active investment.

[5] We ignore the component of the portfolio that is used to hedge against risk that are not priced in the equity valuation. Adler and Dumas (1983) show that this term represents the covariance of capital gains with state variable (time varying investment opportunities) and with inflation. As we ignore second moments of the driving processes for returns and the state variables, we would obtain a constant hedge term which cancels out when we consider the change of w_{at}.

[6] Camanho et al. (2018) also find empirical evidence for such portfolio rebalancing. They use a sample focusing on equity positions of mutual funds, while we have a broader range of investors and securities in our sample. Furthermore, in order to capture active portfolio rebalancing, we follow Bohn and Tesar (1996) and use transactions as the dependent variable, rather than changes in positions.

This term reflects the adjustment of the portfolio weights in accordance with portfolio optimization over time. If risk aversion and the variance-covariance matrix of returns are fixed, investors can adjust their weights if they expect higher returns for a given security.

The rest of the paper investigates empirically which of the two hypotheses best describe the investment decisions of of euro area investors' since 2013.

3 Data

We use data on security-level portfolio holdings and transactions of all 19 euro area Member States from the European System of Central Banks (ESCB) Securities Holding Statistics by Sector (SHSS).[7] The data are collected by National Central Banks from (i) financial investors and (ii) custodians. It covers all short-term and long-term debt securities, listed shares, as well as investment fund shares that are identified with an unique International Securities Identification Number (ISIN). This split into financial instruments is in line with the instruments contained in National Accounts or Balance of Payments Statistics. The data are collected on a quarterly basis since the fourth quarter of 2013 and we use releases until the fourth quarter of 2017Q4 for this analysis. For our period of observation, the data comprise holdings of EUR 25 trillion in the first quarter of 2014 gradually growing to EUR 30 trillion in the fourth quarter of 2017 (see 1).[8] The SHSS data consist of *directly* and *indirectly* reported securities. A financial institution resident in the euro area is obliged to report securities that it holds as its own investment ("direct reporting") as well as securities that it holds in custody ("indirect reporting"). In order to avoid double reporting, only assets held in custody for non-financial investors are included in the SHSS.[9] Investors in the data are defined by their country of residence and sector. In line with the IMF's Balance of Payments Manual (BPM6), our data rely on the residency principle. Therefore, it records all holdings and transactions by investors resident in a country,

[7] This dataset is collected according to Regulation ECB/2012/24, see The Official Journal of the European Union.

[8] Revised versions of our data are available with a significant time lag and we plan to update our analysis with new releases.

[9] Double counting would happen if there are several intermediate financial institutions between the final non-financial investor and the financial institution holding assets in custody.

independent of their nationality.[10] We follow the European System of Accounts (2010)[11] and aggregate the data to five main sectors: monetary and financial institutions excluding monetary authorities (MFI), insurance companies and pension funds (ICPF), other financial institutions (OFI),[12] non-financial corporations (NFCs), and households. Using the ISIN for each security, we merge SHSS data to individual asset characteristics obtained from the ESCB's Centralised Securities Database (CSDB) which contains information on more than six million debt and equity securities issued globally. Therefore, we are able to use information at the security-level, such as the instrument type, market prices, or the currency of denomination.

4 The Development of Euro Area Portfolios

Before we present the empirical framework and results, we give an overview of broad developments in the portfolios of euro area investors during the time period of our analysis. Table 1 shows snapshots of the first and the latest release of the sectoral securities holdings data. In this period, portfolios of euro area investors have increased from around EUR 25 trillion in 2014Q1 to 30 trillion in 2017Q4 which corresponds to 245 and 263 percent of annual euro area GDP, respectively. This strong portfolio growth was driven by the increased holdings of OFIs (mainly investment funds), followed by ICPFs and – to a significant lesser extent – NFCs and households. This trend was only partly offset by the decrease in security holdings of MFIs, which partly reflects the continued deleveraging in the euro area banking sector during this period. Households are the most important retail investors in the euro area, with a portfolio twice and three times as large as those of NFCs and governments. Security holdings in the latter two sectors remain relatively small (accounting for less than 10% of total euro area holdings).

In terms of investors residency, most securities are held by residents of Germany and France, followed by the two financial centres Luxembourg and Ireland. The split by asset class suggests a portfolio shift by euro area investors from debt to equity, mainly towards investment fund (IF) shares. However, this interpretation has to be taken with caution. The increased amount of

[10] E.g. Citis subsidiary in Frankfurt would be considered as holdings of the German banking sector. On the other hand, Deutsche Banks holdings through its subsidiary in New York are not captured.

[11] Link to European System of Accounts (2010).

[12] These include important intermediaries such as mutual funds which represent the largest subgroup of this sector.

investment in IF shares coincides with an increased investment by investment funds in non-euro debt. Thus, we suggest that the shift towards equity partly reflects a channelling of investment into non-euro debt securities via IFs, rather than a rebalancing of portfolios from debt to 'pure' equity. An analysis of the issuer location shows that the holdings of euro area issued securities measured as a share of the overall portfolio have decreased significantly. This was mainly driven by a decrease in holdings of securities issued in the investor's country of residence, suggesting a declining home bias. In contrast, investment in securities issued by non-euro area countries has increased markedly. Notably, there has been a 70% increase with respect to securities issued in the US (measured in EUR).

We observe a decrease in the share of euro denominated securities in our period of observation in Figure 1. This was mirrored in an increase in holdings in foreign currencies, most importantly US dollar and British pound. As this trend has proven steady, events such as the Brexit referendum in June 2016 or the Swiss National Bank's decision to discontinue the peg of the franc against the euro in January 2015 seem to have had a limited effect on holdings of securities denominated in the respective foreign currencies. A major event during our period of observation has been the ECB's Quantitative Easing (Asset Purchase Programme (APP)) which absorbed EUR 2.3 tn of euro-denominated (mainly sovereign) debt assets. However, Figure 1 suggests that the shift towards foreign currency was not only driven by the APP, as the largest decline in the share of euro-denominated securities occurred before the programme started at the end of the first quarter of 2015.[13] The high share of US dollar holdings is significantly driven by IFs located in the financial centres Ireland and Luxembourg (close to 30% of portfolio are US dollar denominated at the end of 2017). At the same time, 95% of securities held by NFCs were denominated in euro between 2013 and 2017, which exceeds the share held by households and even government institutions (87% and 92%, respectively). The decreasing share of euro-denominated holdings is in line with recent findings by Maggiori et al. (2018) for international mutual funds. The authors show that the share of euro-denominated cross-border holdings of corporate debt declined from 35% in 2004 to 20% since 2008 across countries.

Until now, we only presented evidence on stock positions and shares thereof. The change in the holdings of a security can be due to (i) net sales or purchases of that security, (ii) a change in the

[13] In addition, the decline in the share of euro-denominated securities can be observed across all asset classes and not just for debt securities which is the only asset class targeted under the APP. These charts are available upon request.

market price, and/or (iii) a change in the value of the foreign currency for non-euro denominated securities. In Figure 2, we aggregate the development of these values for each quarter. In the upper left graph, we see that overall valuation changes, be them from prices (dotted bars) or the exchange rate (striped bars), exceeded transactions (grey bars) and, therefore, played a bigger role in explaining the total changes in euro area investors portfolios (line).[14] Overall, valuation effects of euro area investors were driven by market price developments. This reflects the fact that over 80% of euro area investors portfolio is denominated in euro. Hence, valuation effects caused by exchange rate fluctuations for this large part of the portfolio are mechanically zero (upper right graph). This is in contrast to the bottom graphs where we show the developments for all foreign currency securities on the left and US dollar denominated securities on the right. Here, effects from the exchange rate largely dominate those stemming from dynamics in market prices. Regarding sectoral heterogeneity, these graphs imply that sectors holding mainly euro denominated securities, such as households and NFCs, show negligible valuation effects from the exchange rate compared to OFIs, where valuation changes stemming from the exchange rate can exceed the effect of price changes.

We continue with descriptive evidence on the development of valuation effects and investment patterns over time. In Figure 3, we plot the average difference in quarterly valuation effects of non-euro vs. euro-denominated securities (foreign excess return) as well as the share of non-euro denominated securities. If investors were to maintain constant security weights, aggregates of non-euro denominated assets would stay constant, independent of the development of their valuation. However, we see that the share of non-euro denominated assets (solid red line) increased drastically in the last five years for both institutional and retail investors. This shift is correlated with the excess return earned on non-euro denominated securities (dashed blue line). As we plot this for institutional investors separately from retail investors, we find that that the former (i) show a stronger correlation with the excess returns (0.84 unconditional for the change in foreign currency shares) and (ii) achieve higher excess returns on non-euro denominated securities than retail investors. This suggests that institutional investors invest not only more pro-cyclically, but are also able to achieve a higher return from valuation with this strategy.

In Figure 4, we shed more light on this pattern as we zoom in on the exchange rate component

[14] Possible discrepancies between the sum of valuation and net purchases and the change in holdings are due to statistical innovations such a a larger population of investors or compilation errors in case investors report holdings, but no transactions of the same security.

of the valuation effect, more specifically for the US dollar as the most important currency of denomination of non-euro denominated securities. We plot the share of US dollar denominated securities (dashed blue line) against the evolution of the EUR/USD exchange rate (solid red line). Again, if investors wanted to keep the exposure to the US dollar fixed, the share of US dollar denominated assets should be flat, independent of the development of the exchange rate. However, we find that the share of US dollar securities in euro area investors' portfolios has risen by around 50% during our time period of observation. This evolved in line with developments of the EUR/USD exchange rate: when the US dollar appreciated against the euro from 2013 to 2015, shares of US dollar holdings were increasing in euro area investors' portfolios. This development only stalled in 2017, when the US dollar depreciated against the euro and investors were decreasing their US dollar share somewhat. Part of this strong correlation is mechanical as the value of the securities is recorded in euros, i.e. the share of US dollar denominated securities will naturally rise when the US dollar appreciates against the euro. However, the magnitudes shown in the graph are far larger than the mechanical adjustment under *ceteris paribus* conditions, as euro investors were heavily investing in the US dollar in times of its appreciation. This picture is in line with models that account for investment behavior based on expected interest rate differentials and/or the time series of valuation changes (e.g. Frankel and Froot (1990)). It is also in line with empirical evidence by (i) Bohn and Tesar (1996) who show that US investors were seeking valuation gains with international investment abroad from 1980-1994 and (ii) Ammer et al. (2018) who show that investors look for yield abroad when interest rates at home are at low levels.

5 The Role of Valuation - Identification Strategy

In this section, we present our empirical framework to identify how investors react to valuation changes at the security level. We recall the result of the IICAPM model laid out above:

$$T_{at} = e_a \sum_{t}^{-1} (\overline{\mu_t} - \overline{\mu_{t-1}}) \alpha P_{t-1} + (\overline{v_t} - v_{at}) w_{at-1} P_{t-1}$$

where the first part of the right hand side $e_a \sum_t^{-1} (\overline{\mu_t} - \overline{\mu_{t-1}}) \alpha P_{t-1}$ represents the adjustment of the weight of an asset in the course of a portfolio optimization, whereas the latter part represents portfolio rebalancing towards a given weight ($(\overline{v_t} - v_{at}) w_{at-1} P_{t-1}$). The *Portfolio Rebalancing*

Hypothesis of the IICAPM therefore predicts that $(\overline{v_t} - v_{at})w_{at-1}P_{t-1}$ determines investment patterns which correspond to net transactions in our data. We test this accordingly with the corresponding part of the model in the equation above. Hence, if all investments happen only for the purpose of portfolio rebalancing towards a constant weight of each asset, we are left with the following equation at the security level:

$$T_{at} = (\overline{v_t} - v_{at})w_{at-1}P_{t-1} \tag{5}$$

so that

$$\frac{T_{at}}{w_{kt-1}P_{t-1}} = (\overline{v_t} - v_{at}) + \epsilon_t \tag{6}$$

$$= -(v_{at} - \overline{v_t}) \tag{7}$$

Therefore, we find portfolio rebalancing towards constant targeted portfolio weights if the coefficient on $(\overline{v_t} - v_{at})$ is significantly negative. This means that net transactions would be lower (or negative, implying net sales) if the valuation gains on asset a are above those of portfolio P.

Translating this to our data, we define the dependent variable capturing net investment flows as

$$\frac{T_{at}}{w_{kt-1}P_{t-1}} = t_{a,j,t} = \frac{Transactions_{a,j,t}}{Holdings_{a,j,t-1}} \tag{8}$$

which are the transactions of asset a by country-sector j in quarter t scaled by holdings of this asset in $t-1$.

In order to calculate the nominal valuation changes of an asset $v_{a,j,t}$, we use the asset specific characteristics of each security to calculate three types of valuation changes at the security level:

1. $v^{pr}_{a,j,t}$ from prices: $\Delta marketprice_{a,j,t} = \frac{price_{a,j,t}}{price_{a,j,t-1}} - 1$
2. $v^{fx}_{a,j,t}$ from the exchange rate: $\Delta exchangerate_{a,j,t} = \frac{fx_{a,j,t}}{fx_{a,j,t-1}} - 1$ [15]
3. $v^{tot}_{a,j,t}$: $= \Delta marketprice_{a,j,t} + \Delta exchangerate_{a,j,t}$

[15] For instance, in the case of the exchange rate of the euro against the US dollar, we define $\frac{EUR}{USD}$ so that an increase in the exchange rate means an appreciation of the US dollar

As laid out in the IICAPM above, we argue that an investor is concerned about changes in the valuation of an asset in relative terms, i.e. compared to the overall valuation dynamics of her portfolio. In empirical international macroeconomics, the terms "push and pull" factors are used, implying that investors are attracted to foreign markets by the prospect of high returns (pull factor), which have to be evaluated against the returns on the domestic portfolio of the investor (push factor). In our model, this idea corresponds to the concept of "excess valuation". The decisive explanatory variable should therefore not only consider the valuation dynamics of a security, but also the evolution of the valuation of the rest of the portfolio. To calculate these relative changes in valuation, we split the securities into three financial asset classes c in line with macroeconomic statistics: debt securities, listed equities, and investment fund shares and calculate an average $\overline{v_t}_{j,c,t}$ valuation change for the portfolio of each country-sector j in one the three asset classes c at a given time t. With these averages of the different asset classes, we calculate three measures of excess valuation gains $val_{a,j,t}$ at the security level to obtain excess valuation from prices $val^{pr}_{a,j,t}$, excess valuation from exchange rate dynamics $val^{fx}_{a,j,t}$, and the total excess valuation $val^{tot}_{a,j,t}$ for each asset a held by country-sector j in time t relative to the average valuation of the portfolio of asset class c:

1. $val^{pr}_{a,j,t} = v^{pr}_{a,j,t} - \overline{v^{pr}_t}_{j,c,t}$
2. $val^{fx}_{a,j,t} = v^{fx}_{a,j,t} - \overline{v^{fx}_t}_{j,c,t}$
3. $val^{tot}_{a,j,t} = v^{tot}_{a,j,t} - \overline{v^{tot}_t}_{j,c,t}$

In our baseline specification, we relate these measures of excess valuation to investment, i.e. net transactions:

$$t_{a,j,t} = \beta_1 * val^{tot}_{a,j,t} + \beta_2 * val^{tot}_{a,j,t} * EUR + FE_a + FE_j \tag{9}$$

where $val^{tot}_{a,j,t}$ is the total relative valuation change for asset a, held by country-sector j in time t as described above. FE_a are *Security Fixed Effects* to absorb time-invariant security characteristics, such as original maturity or currency denomination, while FE_j are *Country-Sector Fixed Effects* to control for any country-sector specific factors that could possibly drive investment behaviour over the time frame of our analysis, such as the portfolio growth of a county-sector.[16]

[16]The importance of portfolio growth in driving overall capital flow developments has recently been documented by Ahmeda et al. (2016) and Meng and van Wincoop (2018).

An interaction of the total relative valuation change $val^{tot}_{a,j,t}$ with a EUR Dummy is included in order to estimate a differential effect of valuation changes of euro-denominated vs. foreign currency denominated securities.

For the sample of foreign currency denominated securities, we can furthermore disentangle the effect of the relative valuation from price vs. exchange rate dynamics:

$$t_{a,j,t} = \beta_1 * val^{pr}_{a,j,t} + \beta_2 * val^{fx}_{a,j,t} + FE_a + FE_j \tag{10}$$

where $val^{pr}_{a,j,t}$ are the relative valuation changes from prices and $val^{fx}_{a,j,t}$ are the relative valuation changes from the exchange rate as described above. For all regressions, we cluster standard errors at the *issuer country * quarter* level in order to account for correlation of valuation within an issuer country, e.g. co-movement of market prices on the same stock market. In a robustness test, we also include time fixed effects in order to confirm that our results are not purely driven by unobserved time-specific factors.

Relating this specification to our hypotheses outlined in Section 2, we would find evidence for our *Portfolio Rebalancing* Hypothesis if $\beta_1 < 0$. This would mean that investors sell (buy) a security if the value of the asset increases (decreases) in order to maintain a targeted share of this asset in their portfolio. On the other hand, $\beta_1 > 0$ would reject the *Portfolio Rebalancing* Hypothesis and would therefore suggest *Momentum Investment* as investors buy more (less) of an asset that is appreciating (depreciating) in value compared with the rest of the portfolio. As our data are at quarterly frequency, we suggest that the contemporaneous effect, i.e. $beta_1$, is the correct one to consider for our regression and its interpretation.[17]

6 Estimation Results

In this section, we present the results of our baseline specification including an analysis by sector, asset class, as well as country heterogeneity. Furthermore, we identify several investment patterns underlying our main result as well as robustness tests of our baseline specification.

[17] Following Camanho et al. (2018), we reproduce all our results where we also control for the lagged value of $v_{a,j,t-1}$ which leaves our coefficients almost identical in terms of size as well as in significance.

6.1 Baseline specification

We present the results of our baseline estimation in Table 2 where we consider the contemporaneous conditional correlation of valuation changes and net transaction for all securities in our sample in column (1). We observe that our variable of interest is significantly positive. This rejects our *Portfolio Rebalancing* Hypothesis and at the same time presents evidence for "momentum investment" as investors show higher net purchases of a security when they experience higher gains from valuations relative to the rest of their portfolio. If a security's excess valuation gain (relative to the rest of the sectors portfolio in t) increases by one percentage point, net purchases of this security (expressed as a percentage of holdings in $t-1$) are estimated to increase by about 7 percentage points. This holds controlling for country-sector as well as security fixed effects.[18] In column (2), we introduce an interaction effect with the euro dummy as we argue that investors differentiate their investment strategy between domestic and foreign currencies.[19] We observe that the coefficient on the interaction term is significantly negative, although not outweighing the base coefficient which suggests that there is less pro-cyclical investment in euro-denominated assets as compared to foreign currency assets, which hence drive our strong positive coefficients overall. This is consistent with Meng and van Wincoop (2018) who document for US international capital flows that there is no rebalancing at the quarterly frequency. Column (3) differentiates once more between euro denominated vs. foreign currency denominated assets. As there is no valuation effect coming from the exchange rate for the former group, we compare only the valuation effects due to market prices between the two groups. We find that investors purchase securities with an equal price momentum in euro and non-euro denominated securities. This suggests that the stronger overall result from non-euro denominated securities is driven by valuation effects due to exchange rate movements. To explore this further, columns (4) - (8) only include non-euro denominated securities. We find the overall coefficient to be significantly positive and higher compared to the overall sample, which again shows that euro area investors react in a more pro-cyclical way to valuation changes in foreign currencies as compared to euro-denominated assets. In column (5), we divide the overall excess valuation effect in price and exchange rate components. We find that the coefficients on prices as well as the exchange rate on net purchases are significantly positive, but that the latter is five times as large in magnitude.

[18] We also run all of the regressions in this table without and with either one of the set of fixed effects alone and we obtain results that are at least equally significant. Available upon request.

[19] The base coefficient of the currency of denomination is captured by the security-level fixed effects.

This implies that investors are more likely to invest in securities where the valuation changes from the exchange rate outperform those emanating from the exchange rate in the rest of the foreign currency portfolio. As we observed strong rebalancing towards US dollar-denominated assets, we interact both of the valuation variables with the US dollar in column (6). We see that the strong positive coefficient from the exchange rate is driven entirely by US dollar securities, while investors show less return chasing for US dollar securities in reaction to changes in the market price compared to other foreign currency denominated assets. All results hold when we include no fixed effects or either one of the set of fixed effects alone. In addition, the results are robust to the inclusion of time fixed effects which control for time-specific factors.[20]

6.2 Heterogeneity by Asset Class

6.2.1 Debt securities

In Table 3 we repeat the above analysis for debt securities only. While the overall coefficient in column (1) remains significantly positive, the interaction with the euro in column (2) shows that there is no pro-cyclical investment in euro denominated debt assets as the negative interaction weighs out the positive base effect.[21] In addition, we find in column (3) and (4) that the overall dynamics are driven by long term securities, rather than short term debt securities (i.e. with an original maturity of less than a year).[22] As column (2) shows clearly that the positive coefficient on valuation changes is driven by foreign currency denominated securities, we focus on these securities in columns (5) - (7). In line with our findings for all asset classes, column (5) shows that the overall effect from valuation is significantly stronger for non-euro denominated debt securities. Column (6) reveals again that this is driven by the exchange rate, while the effect from prices is also significantly positive, but much smaller than the coefficient on the exchange rate (in line with Table 2). In column (7), we observe that for debt, this relatively stronger result of the exchange rate dynamics applies to foreign currency denominated debt securities in general, as the base effect remains positive when including an interaction effect with the US

[20] These results are available upon request

[21] This result could be driven by the ECB's Asset Purchasing Programme (APP) as euro area investors sold significantly more assets eligible to be bought under the APP (Bergant et al., 2018). These assets were appreciating in the course of the programme. We further test this hypothesis in the Robustness section.

[22] The sample of short-term debt securities is much smaller, partly reflecting our scaling of transactions by holdings in $t-1$. We therefore carry on by focusing our analysis on long-term debt securities.

dollar. The US dollar interaction coefficient, in turn, is again significantly positive, implying that investors behave even more pro-cyclically, with regard to exchange rate valuation changes in US dollar denominated assets.

6.2.2 Listed Equities and Investment Fund Shares

We turn to equity in Table 4 which we split into listed equities in column (1) - (4) and investment fund shares in column (5) - (8). We find coefficients on valuation changes to be the smallest for listed equities across all asset classes, which is – as for debt securities – even outweighed by the negative euro interaction term. In addition to this, column (4) shows that listed equity is the only asset class where the effect of the exchange rate shows to be insignificant which causes the overall smaller result for this asset class. We suggest that the intuition for this result is that listed equity is more driven by real investment concerns (i.e. into tangible or intangible parts of a company), while the currency denomination of the security matters.

In contrast, the coefficients for relative valuation changes on investment fund shares are around ten times larger and considerably more significant. Column (6) shows that this strong pro-cyclical investment applies to euro denominated securities as much as for non-euro denominated securities. Looking at foreign currency investment fund shares, we also observe that price effects have almost as large effects on net transactions as exchange rate changes. The mechanism for this relatively stronger effect for investment fund shares is likely simple: investors invest in appreciating investment funds which beat their peers. A deeper analysis of these results would be possible with granular information on the ultimate investments of investment funds which is difficult to identify.[23]

6.3 Sector Heterogeneity

6.3.1 Sector Heterogeneity for Debt Securities

In Tables 5 to 7, we report our main specifications across asset classes with heterogeneous coefficients for each sector. In Table 5, our main finding for debt securities is that institutional

[23] We did collect data on the main mandate of each investment fund. However, a large share of investment funds is identified as "mixed" funds which means they can invest in bonds, equity, as well as other instruments. It is therefore hard to trace the investment behaviour to the ultimate securities of the investment funds.

investors (MFIs, ICPFs and OFIs) behave significantly different compared to NFCs and households. First, institutional investors show significantly stronger pro-cyclical patterns which are, however, more than offset by the interaction with the euro dummy. This suggests that euro area institutional investors cash out on euro denominated bonds after recording valuation gains. This is also consistent with these investors chasing higher yields, which are inversely related to bond prices. Thus, euro area institutional investors behave only pro-cyclically with regard to non-euro denominated debt securities which is driven by relatively larger coefficients on exchange rate-induced valuation gains for MFIs and OFIs and market price-induced valuation gains for ICPFs (column (6) to (10)).[24] Retail investors, i.e. non-financial corporations and households, show smaller overall coefficients which are mainly driven by the exchange rate dynamics of foreign currency denominated assets (columns (9) and (10)).

6.3.2 Sector Heterogeneity for Listed Equities and Investment Fund Shares

Similarly to debt, we find institutional investors to be significantly different than retail investors when rebalancing their portfolio of listed equity. The former group shows again stronger overall momentum chasing (column (1)-(3)). Households exhibit even counter-cyclical behaviour by selling assets that are relatively appreciating in value. These results persist for euro-denominated securities, although pro-cyclicality is much less pronounced, in particular for MFIs, while NFCs exhibit counter-cyclicality for euro-denominated securities. Column (6)- (8) show for non-euro denominated securities that the pattern for institutional investors is not driven by the exchange rate for this asset class, but by market price movements. This is in line with our previous assertion that investors see equities as a more "real" asset so that the currency of denomination is less important. The counter-cyclical behaviour of households is driven by the negative coefficient on price dynamics which also holds for the sample of non-euro denominated securities (column (10)).

In line with the overall finding above, we observe the strongest positive effects for investment fund shares. Again, the coefficients are stronger for institutional investors, but all coefficients are in line with the baseline results. The euro interaction effect is only significant for banks (with a negative sign, but not outweighing the positive base coefficient), while all sectors invest

[24] We are cautious to speak of portfolio rebalancing for banks as security holdings only reflect a part of their overall assets.

pro-cyclically following both price as well as exchange rate movements for non-euro denominated securities.

6.4 Country Heterogeneity

The euro area sovereign debt crisis exposed significant country-differences in terms of macroeconomic and financial stability within the euro area. Accordingly, when analyzing financial investment in the post-crisis period, the literature finds significantly different results for more and less vulnerable euro area countries (e.g. for recent portfolio rebalancing the euro area Bergant et al. (2018); Koijen et al. (2018); Albertazzi et al. (2018)). The intuition is that (formerly) stressed countries might be constrained in optimally allocating their portfolio or reaching for yield, as a legacy from the recent crisis. In our case, investors could refrain from rebalancing towards more holdings in foreign currencies when they are reluctant to take on more risk in the form of foreign currency exposure, possibly due to tighter regulatory constraints.

In Table 8, we split our sample between formerly stressed countries – Greece, Italy, Portugal, Spain – and the rest of the euro area. We see in columns (1) and (2) that the coefficients on valuation effects for non-stressed countries is more than twice as large and more significant. Similarly, we also observe that the baseline results for the regression including the euro dummy is mainly driven by non-stressed countries (columns (3) and (4)). For stressed countries, the baseline coefficient is barely significant and this effect is not significantly different for euro-denominated securities. In column (5) and (6), we only consider non-euro denominated securities where we find that (i) momentum investment in response to price changes is only significant for non-stressed countries and (ii) the coefficient on valuation changes due to exchange rate dynamics is smaller as well as less slightly significant for stressed countries. Notably, Table 8 includes Luxembourg and Ireland in the non-stressed group. In order to test whether the results for this group are driven by these financial centers, we re-run the same specifications excluding them and the results are identical in significance and very similar in terms of magnitude.[25] Summing up, the findings are in line with our intuition outlaid above, namely that stressed countries might have tighter constraints to follow "momentum investment" as a legacy from the recent crisis.

[25] These results are available upon request.

6.5 Patterns of Momentum Investment

6.5.1 Expectations of Macroeconomic Performance

Now that we have rejected the *Portfolio Rebalancing* Hypothesis, the theory laid out in Section 2 suggests that expectations of future returns determine the portfolio weights of securities and therefore return chasing behaviour. This can be perfectly in line with portfolio optimization if investors adjust their desired exposure to an issuing country according to the economic outlook. Rather than entering a more complex area of asset pricing regressions, we stay on a macro level in the following analysis. In Table 9, we test whether return-chasing might be correlated with an adjustment in expectations on the macroeconomic performance of the issuer country. We use changes in the five-year ahead GDP forecasts from different vintages of the World Economic Outlook (WEO) database of the IMF for all issuer-countries of securities to test whether the investment response to valuation changes is driven by changes in the economic outlook for the issuer country of a security.[26]

Our results in Table 9 show two main effects. While the interaction of excess valuation effects with changes in the five-year ahead forecast of real GDP growth (measured in percentage points) is insignificant for the whole sample, there is indeed a significantly positive coefficient for foreign currency denominated securities (column 3). This suggests that changes in the economic outlook of the issuer country is highly important for euro area investors when making investment decisions on foreign currency securities. One explanation for this result could be that investors need to rely on broad macroeconomic forecasts or similar information for foreign (currency) securities due to larger informational frictions. As before, we split the valuation into changes resulting from price dynamics and from exchange rate changes in column (4). We find that the interaction effect with the change in the macroeconomic forecast is driven by the valuation effect coming from exchange rate dynamics. Therefore, for two securities where currencies appreciate equally, euro area investors invest significantly more in securities issued in a country where they experience a positive change in the expectation of the country's macroeconomic performance. In

[26] Specifically, changes in the WEO forecast can materialize with the April (second quarter) and October (fourth quarter) releases each year. For the two quarters without WEO releases, we interpolate the changes to the forecast. In using the WEO forecasts, we do not argue that investors (for instance board members of investment funds) follow specifically these numbers when adjusting their portfolio shares of securities, but we use this variable as a proxy for general shifts in investor sentiment towards a country. To the best of our knowledge, the WEO forecast is the richest database for economic forecast for a global range of countries with a publicly available history of forecast vintages.

column (5) and (6), we split the sample according to whether the forecast of the issuer country of a security has been revised upwards or downwards as this should directly reflect changes in expectations. We find that our baseline effect for the overall sample is driven by securities where expectations on projected GDP growth for the issuing country are higher than in the previous quarter. Therefore, investors reach for return from valuation only for those securities that are issued by countries with an improving economic outlook.

6.5.2 Other Patterns of Momentum Investment

In the following section, we address several alternative interpretations as well as underlying mechanisms of our findings in Table 10. First, we analyze whether we observe different investment patterns for high quality (column (1)) and low quality (column (2)) assets. It is considered a key principle in finance that return is only meaningful on a risk-adjusted basis. When investors face a trade-off between and appreciating asset and its risk, they should prefer to invest more (less) in a relatively safer appreciating (depreciating) asset, all else equal. We acknowledge that risk is hard to measure and use a quality classification based on official ratings from the four biggest rating agencies to separate assets in high quality and low quality assets. The former group consist of all debt securities that are labelled with the highest quality step in the ECB harmonised rating scale[27] for more than half of the time of our observation while all other securities are in the latter group.[28] This provides us with a standardized proxy for an asset's risk which is not affected by liquidity or overall market conditions. In line with our intuition above, we find that momentum-investment patterns are significantly stronger for highly rated securities. We interpret this as good news for policy makers regarding the risk taking of institutions. The finding is moreover in line with Becker and Ivashina (2015) who show that reaching for yield by insurance companies in the US is less appealing for lower rated compared to higher rated securities.

In column (3) and (4) we divide the sample depending on whether the valuation experienced is a loss or a gain. Effects might be asymmetric for many reasons, such as loss aversion or pressure from investors. We find that our baseline results are driven by positive valuation changes

[27]Long term debt securities are labelled with the highest quality step if they obtain one of the following ratings: DBRS:AAA/AAH/AA/AAL, Fitch Ratings:AAA/AA+/AA/AA-; Moody's:Aaa/Aa1/Aa2/Aa3; Standard& Poor's:AAA/AA+/AA/AA-. For a more detailed description, see ECB (2015), page 20.

[28]The groups of high and low quality debt securities are approximately of the same size.

(i.e. gains), while the coefficient on valuation losses turns out to be insignificant.[29] In column (5) and (7), we test non-linearities regarding the size of valuation gains and losses. The idea is that investors might react stronger to extreme movements in prices or exchange rates. We find in column (5) that the reaction to extra strong movements in prices[30] is insignificant for gains so that investors seem to react linearly to valuation gains. For losses, this interaction is significantly negative which even outweighs the base effect. This means that investors would buy securities after especially big price decreases. A reason for this could be that they take the chance to acquire a certain asset at a low price, which might signal a possible undervaluation of the security.

For exchange rate dynamics, we find stronger effects for especially large movements in the exchange rate which are in line with momentum investment. The interaction with stark positive exchange rate movements shows that investors buy dis-proportionally more of a security if the appreciation in the respective exchange rate is relatively stronger. One of the reasons for this behaviour might be that they expect large exchange rates to mirror the development of macroeconomic fundamentals. In the same vein, investors are selling securities that experience large valuation losses due to exchange rate movements.

Finally, in the last column, we analyze whether investors that are relatively more exposed to a currency react stronger to changes in valuation of a security denominated in that currency. We define a dummy that is equal to 1 if the sector is within the top 10% of the most exposed sectors in a given time period. We observe that the interaction is insignificant which means higher and relatively lower exposed investors react similar to valuation changes due to exchange rate movements.

6.5.3 Persistence of investment patterns

In Table 11, we analyze another dimension of return chasing, namely persistence. The idea is that investors should react differently to temporary vs. longer-term movements in valuation. For gains, it might also be rational to speculate on price increases so that prices are pushed away from fundamentals (DeLong et al., 1990; Abreu and Brunnermeier, 2003). On the other

[29] We show in our next table (Table 11), however, that this result reverts as soon as the loss is more persistent.

[30] Stark movements (prices or exchange rate) are indicated by a dummy which is equal to one if the valuation was within the largest 10% of the valuation movements for that time period.

hand, it can be risky to keep depreciating securities as asset prices have shown to continue price trends for several quarters before a reversion (see for instance Cutler et al. (1990, 1991) or more recently Moskowitz et al. (2012)).

To test these hypotheses, we interact valuation effects with the number of consecutive quarters of the same type of valuation change (i.e. gains vs. losses). Overall, we find that the momentum chasing effect is generally stronger when more persistent (column(1)) and larger for gains than for losses (column (2)). This overall effect is in line with our idea on expectations: investors are more likely to shift their targeted portfolio share when changes (in valuation) are persistent and not just outliers. More detailed insights come from column (3) and column (4) where we find different narratives for gains and losses. For a better overview, these results are presented in Figure 5. For valuation gains, the return chasing behavior peaks at two quarters of consecutive gains for a security and decreases afterwards. This could be driven by expectations of mean reversion after a persistent price increases. However, the negative interaction terms in a given quarter never outweigh the strong positive base effect, implying that we observe return chasing for temporary as well as persistent valuation gains, albeit much smaller for the latter. For losses (column (4)), we see that the baseline effect is negative and therefore in contrast to our general results. Investors might be tempted to buy securities where they see a temporary price decrease in order to purchase them at a relatively lower price. However, if the loss is persistent, this effect is outweighed by the interaction term so that investors sell securities for which they experience a persistent loss in valuation. This can be driven by leveraged institutional investors, such as banks and investment funds, that might be forced to sell depreciating assets due to margin calls (Shleifer and Vishny, 1992).

6.6 Robustness Tests

We conduct several robustness tests to our main specification. Data availability restricts us to analyze a special time period for the euro area when the ECB introduced various measures of unconventional monetary policy. Thus, one could suggest that our results are only driven by the ECB's asset purchases of euro denominated securities. However, we already showed in Section 4 descriptively (particularly Figure 1) that our results are unlikely to be only driven by only by the APP for several reasons. First, the greatest decline in the share of euro denominated securities happened already before the APP started in the first quarter of 2015. Secondly, we can observe

a decline in euro denominated securities in all assets classes, while only debt securities were targeted under the APP. In this section, we test this formally by splitting the sample in the first quarter of 2015 when the largest component of the programme – the Public Sector Asset Purchase Programme (PSPP) including large-scale purchases of public sector securities – was announced and introduced. In column (1) and (2) of Table 12, we run our main specification for debt securities and find that the coefficient on valuation effects is indeed larger for the period after APP was announced (in column (2)). However, the coefficient for valuation changes before the programme (column (1)) also turns out to be highly significant and positive despite the short time span considered which means that the momentum investment patterns are not entirely driven by the introduction of the APP.

In a second robustness test, we follow Camanho et al. (2018) and we include the lag as a control of reverse causality. The idea is that if a sector in the euro area buys (sells) significant amounts of a specific security, this may increase (decrease) the market price and therefore generate a generate a relatively higher (lower) return and drive our positive coefficient on the contemporaneous valuation changes. This logic does not apply to the lagged change in valuation changes. We find that all the results hold for our main findings and that size and significance stay almost identical. We can confirm that even when we control for the lagged value of the relative valuation change there is a positive relationship between contemporaneous relative return and net purchases (column (3)) and a smaller, but still positive coefficient for euro-denominated securities (column (4)). The strong positive coefficient for foreign currency securities continues to be driven by the exchange rate component (column (5)). Looking just at the coefficients from the lagged values, we can say that the main findings on foreign securities in column (4) and (5) can also be found in the lagged values of our variables.

7 Conclusion

The empirical findings presented in this paper provide robust evidence for momentum investment by euro area investors in the period 2013 to 2017. Rather than rebalancing assets towards constant portfolio shares, net purchases of a given security were larger (smaller) when a relatively higher (lower) valuation gain was recorded. Overall, this pattern is driven by securities denominated in foreign currency where the effect from exchange rate dynamics is significantly stronger than the effect from price movements. For these assets, momentum investment is

stronger and significantly correlated with the expectations about the issuer country's economic outlook. Thus, our findings suggest that investors shift their targeted portfolio shares according to their expectations of the future economic performance of the group of issuers. Due to the granularity of the micro data used in this paper, we can also document that momentum investment is particularly strong for institutional investors as well as in countries less affected by the recent global and euro area financial crises.

Behind this overall mechanism, we provide evidence for several interesting patterns of momentum investment. We show that the baseline effect is driven by gains rather than losses and by investment in high quality debt securities. The rebalancing towards appreciating securities is significantly stronger when exchange rate movements are relatively large, but uncorrelated to the investors' initial exposure to the specific currency. Finally, we analyze the dynamics of temporary vs. persistent movements of prices. Investors strongly invest in assets where they experience a short-to-medium term gain, albeit this effect weakens over time.

Our findings are important for policy makers as well as for issuers of securities. Knowing the investor base and their investment patterns of different asset classes improves the ability to predict reactions to changes in the financial environment. Investors who conduct momentum investment can increase the probability of sudden stops and surges in capital flows with repercussions to the real economy (Forbes and Warnock, 2012), for instance by reinforcing the procyclicality of domestic credit growth. We suggest that these considerations are currently important for several reasons. First, euro area monetary policy is expected to normalize over the next years which is very likely to affect the conditions on financial markets. Second, we recently observed turmoils in several emerging markets where euro area investors hold a significant share of outstanding debt.

In this regard, we emphasize that our findings indicate that momentum investment is driven by periods of valuation gains, rather than losses, and targeted at countries with an improving economic outlook. Thus, while our period of observation was largely characterized by increasing asset prices, our results indicate that in periods of falling asset prices, euro area investors may not automatically reverse their investments. Following the intuition of the work by Ahmeda et al. (2016) and Meng and van Wincoop (2018) who break down capital flows into portfolio growth and portfolio reallocation components, we argue that the role of portfolio growth is also an important factor. Euro area investors experienced strong portfolio growth of approximately

20 percent in the last five years. In line with our findings for the euro area, Meng and van Wincoop (2018) show that portfolio growth and reallocations from domestic to foreign securities account for most of US capital flows to individual countries, while portfolio growth proves very persistent. Therefore, portfolio growth and its persistence are additional reasons why the normalization of euro area monetary policy or turmoils in foreign markets may not automatically entail large readjustments in euro area investors' portfolios.

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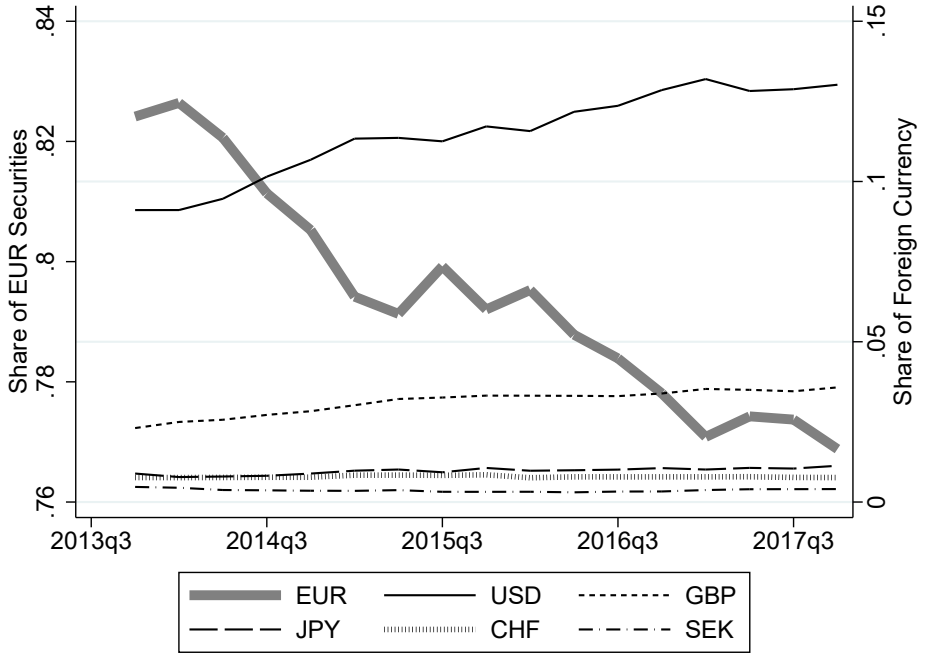
Figures

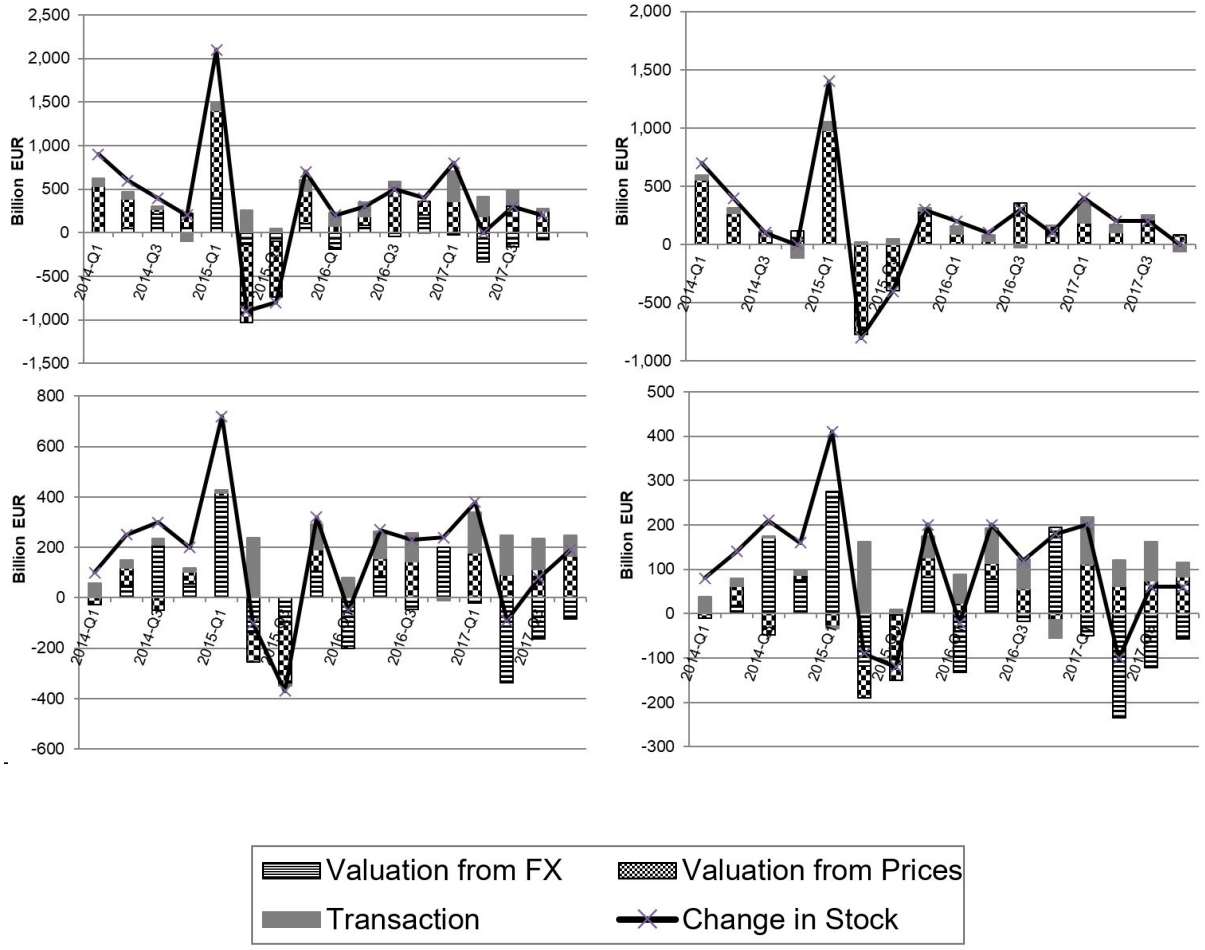
Figure 1: Currency Shares in Euro Area Portfolios



Source: Authors' calculation; Data: European Central Bank

Notes: All values for the calculation of shares are measured in EUR.

Figure 2: Capital Flows and Valuation Changes

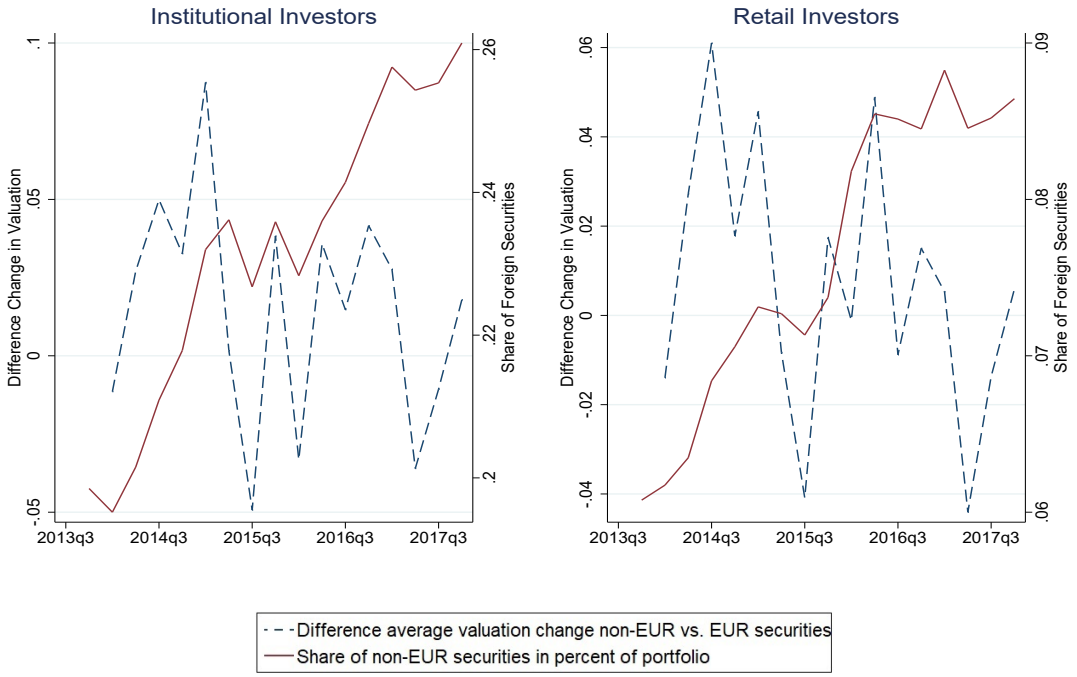


Source: Authors' calculation; Data: European Central Bank

Notes: The top left graph includes all securities; the top right graph includes only euro denominated securities; the bottom left graph includes all non-euro denominated securities; the bottom right graph includes only US dollar denominated securities.

All values are in billion EUR. The small discrepancies between the change in the stock (line) and the sum of the bars results from changes in coverage or compilation errors, in line with the "Other Flows" category in the BoP.

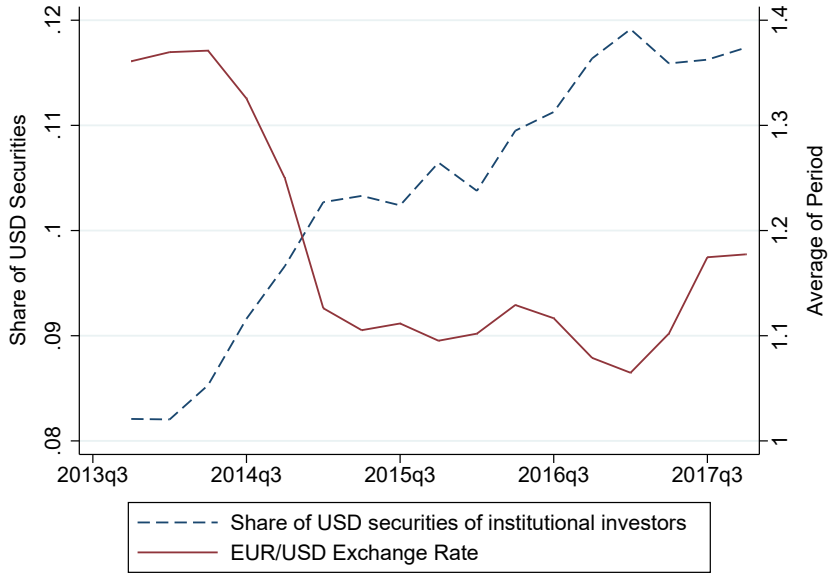
Figure 3: Excess Valuation and the Share of non-euro denominated Securities



Source: Authors' calculation; Data: European Central Bank

Notes: The blue line shows the difference of the weighted average valuation changes of non-euro denominated securities and the weighted average valuation changes of euro denominated securities (in percent). When the blue line is above 0, investors experienced higher valuation gains from non-euro denominated securities compared to euro denominated securities on average. The red line shows the share of non-euro denominated securities in the portfolio.

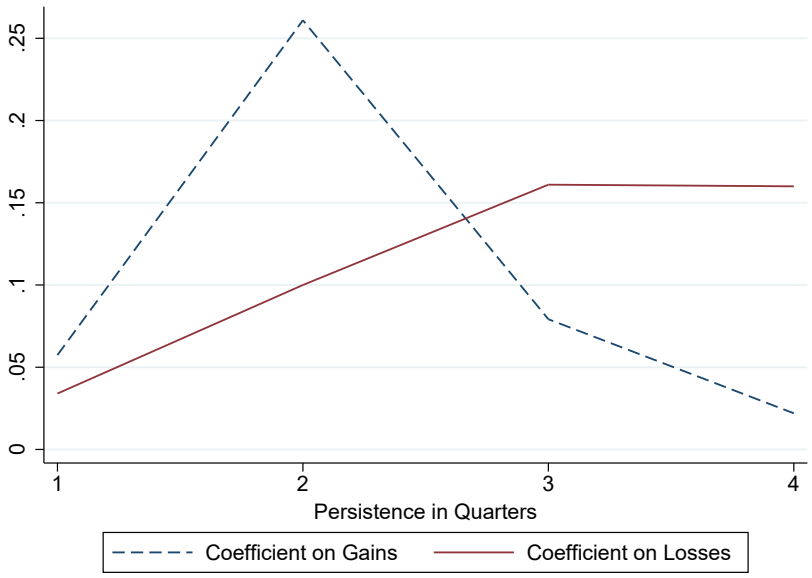
Figure 4: Share US Dollar Securities and EUR/USD Exchange Rate



Source: Authors' calculation; Data: European Central Bank

Notes: The blue line shows the share of US dollar denominated securities in the total portfolio. The red line is the EUR/USD exchange rate. Therefore, a decrease in the line means an appreciation of the USD.

Figure 5: Coefficients from Table 11



Source: Authors' calculation

Notes: Coefficients from regressions displayed in Table 11.

Tables

Table 1: Summary Table

		2014Q1		2017Q4	
		bn EUR	**%**	**bn EUR**	**%**
ALL		**24 460**	**100%**	**29 314**	**100%**
Sector	MFI	6 227	25%	5 298	18%
	OFI	7 365	30%	10 664	36%
	ICPF	5 275	22%	7 166	24%
	NFC	1 504	6%	1 746	6%
	HH	3 273	13%	3 488	12%
	GOV	816	3%	953	3%
Country	DE	5 336	22%	6 559	22%
	FR	5 393	22%	5 804	20%
	LU	2 774	11%	4 139	14%
	IE	1 403	6%	2 470	8%
Asset Class	Debt	14 014	57%	14 418	49%
	Equity	5 113	21%	7 065	24%
	IF shares	5 333	22%	7 831	27%
Issuer Location	All EA	19 606	80%	21956	75%
	of which domestic	13 212	54%	13787	47%
	US	1 630	7%	2 771	9%
	UK	997	4%	1 430	5%
	Emerging	507	2%	761	3%

Source: Authors' calculations; Data: European Central Bank
Notes: Descriptive Table. Values are in bn EUR.

Table 2: Baseline Specification

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	All Securities			Non-euro denominated Securities		
	(1)	(2)	(3)	(4)	(5)	(6)
$val^{tot}_{a,j,t}$	0.0712***	0.0938***		0.0911***		
	(7.98)	(12.08)		(12.22)		
$val^{tot}_{a,j,t}$*EUR		-0.0630***				
		(-2.94)				
$val^{p}_{a,j,t}$			0.0561***		0.0646***	0.0825***
			(7.89)		(8.72)	(10.96)
$val^{fx}_{a,j,t}$					0.352***	0.0452
					(6.95)	(0.85)
$val^{p}_{a,j,t}$*EUR			0.0255			
			(1.33)			
$val^{p}_{a,j,t}$*USD						-0.0347***
						(-2.67)
$val^{fx}_{a,j,t}$*USD						0.563***
						(6.99)
N	22190248	22190248	22190248	8144163	8144163	8144163
Country-Sector FE	x	x	x	x	x	x
ISIN FE	x	x	x	x	x	x

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in $t-1$: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ is the total change in valuation of asset a in time t relative to the rest of the portfolio.
$val^{p}_{a,t}$ is the change in valuation due to price changes of asset a in time t relative to the rest of the portfolio.
$val^{fx}_{a,t}$ is the change in valuation due to exchange rate changes of the currency of denomination of asset a in time t relative to the rest of the portfolio.
EUR and USD are dummies for denomination in euro and US dollar, respectively.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 3: Debt Securities

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	All Securities				Non-Euro denominated Securities		
	All		Long-term	Short-term			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$val^{tot}_{a,j,t}$	0.0679**	0.240***	0.0622**	0.200	0.234***		
	(2.54)	(8.50)	(2.52)	(1.40)	(8.60)		
$val^{tot}_{a,j,t}$*EUR		-0.271***					
		(-5.97)					
$val^{p}_{a,j,t}$						0.0813***	0.0482*
						(4.74)	(1.86)
$val^{fx}_{a,j,t}$						0.510***	0.226***
						(8.11)	(4.50)
$val^{p}_{a,j,t}$*USD							0.0442
							(1.46)
$val^{fx}_{a,j,t}$*USD							0.440***
							(4.20)
N	13230264	12291680	12291680	936984	3630769	3630769	3630769
Country-Sector FE	x	x	x	x	x	x	x
ISIN FE	x	x	x	x	x	x	x

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in t − 1: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ *is the total change in valuation of asset a in time t relative to the rest of the portfolio.*
$val^{p}_{a,t}$ *is the change in valuation due to price changes of asset a in time t relative to the rest of the portfolio.*
$val^{fx}_{a,t}$ *is the change in valuation due to exchange rate changes of the currency of denomination of asset a in time t relative to the rest of the portfolio.*
EUR and USD are dummies for denomination in euro and US dollar, respectively.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 4: Equity Securities

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	Equity				**IF Shares**			
	All Securities		Non-Euro Securities		All Securities		Non-Euro Securities	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$val^{tot}_{a,j,t}$	0.0380***	0.0486***	0.0478***		0.266***	0.285***	0.287***	
	(6.78)	(6.99)	(6.85)		(13.89)	(13.19)	(13.05)	
$val^{tot}_{a,j,t}$*EUR		-0.0552***				-0.0335		
		(-6.09)				(-0.90)		
$val^{p}_{a,j,t}$				0.0460***				0.238***
				(6.45)				(11.75)
$val^{fx}_{a,j,t}$				0.0664				0.314***
				(0.85)				(5.72)
N	3630790	3630790	2825933	2825933	5328918	5328918	1601033	1601033
Country-Sector FE	x	x	x	x	x	x	x	x
ISIN FE	x	x	x	x	x	x	x	x

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in $t-1$: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ is the total change in valuation of asset a in time t relative to the rest of the portfolio.
$val^{p}_{a,t}$ is the change in valuation due to price changes of asset a in time t relative to the rest of the portfolio.
$val^{fx}_{a,t}$ is the change in valuation due to exchange rate changes of the currency of denomination of asset a in time t relative to the rest of the portfolio.
EUR is a dummy for denomination of asset a in euro.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 5: Sector Heterogeneity for Debt Securities

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	ICPF (1)	**OFI** (2)	**MFI** (3)	**NFC** (4)	**HH** (5)	**ICPF** (6)	**OFI** (7)	**MFI** (8)	**NFC** (9)	**HH** (10)
$val^{tot}_{a,j,t}$	0.307***	0.251***	0.442***	0.186***	0.0907***					
	(7.44)	(7.83)	(5.10)	(4.96)	(3.76)					
$val^{tot}_{a,j,t}$ * EUR	-0.407***	-0.403***	-0.570***	-0.152***	-0.0357					
	(-8.16)	(-4.62)	(-3.84)	(-2.85)	(-0.72)					
$val^{p}_{a,j,t}$						0.205***	0.120***	-0.0369	0.0232	-0.0454*
						(5.81)	(6.24)	(-0.62)	(0.74)	(-1.81)
$val^{fx}_{a,j,t}$						0.304***	0.551***	1.309***	0.427***	0.372***
						(3.57)	(5.86)	(8.10)	(8.40)	(7.82)
N	13230264					3717117				
Country-Sector FE	x	x	x	x	x	x	x	x	x	x
ISIN FE	x	x	x	x	x	x	x	x	x	x
SECTOR * EUR	x	x	x	x	x					

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in t − 1: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ *is the total change in valuation of asset a in time t relative to the rest of the portfolio.*
$val^{p}_{a,t}$ *is the change in valuation due to price changes of asset a in time t relative to the rest of the portfolio.*
$val^{fx}_{a,t}$ *is the change in valuation due to exchange rate changes of the currency of denomination of asset a in time t relative to the rest of the portfolio.*
EUR is a dummy for denomination of asset a in euro.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 6: Sector Heterogeneity for Listed Equity Securities

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	ICPF (1)	**OFI** (2)	**MFI** (3)	**NFC** (4)	**HH** (5)	**ICPF** (6)	**OFI** (7)	**MFI** (8)	**NFC** (9)	**HH** (10)
$val^{tot}_{a,j,t}$	0.214***	0.168***	0.165***	0.00640	-0.0810***					
	(13.41)	(19.07)	(3.33)	(0.69)	(-10.52)					
$val^{tot}_{a,j,t}$ * EUR	-0.124***	-0.0283*	-0.163***	-0.0540***	-0.0118					
	(-5.92)	(-1.92)	(-2.61)	(-3.98)	(-1.19)					
$val^{p}_{a,j,t}$						0.212***	0.168***	0.166***	0.00130	-0.0838***
						(14.58)	(20.63)	(3.79)	(0.14)	(-10.71)
$val^{fx}_{a,j,t}$						0.0388	-0.00699	-0.0502	0.164**	0.116**
						(0.33)	(-0.06)	(-0.10)	(2.04)	(2.39)
N	3630790					2825933				
Country-Sector FE	x	x	x	x	x	x	x	x	x	x
ISIN FE	x	x	x	x	x	x	x	x	x	x
SECTOR * EUR	x	x	x	x	x					

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in $t-1$: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ is the total change in valuation of asset a in time t relative to the rest of the portfolio.
$val^{p}_{a,t}$ is the change in valuation due to price changes of asset a in time t relative to the rest of the portfolio.
$val^{fx}_{a,t}$ is the change in valuation due to exchange rate changes of the currency of denomination of asset a in time t relative to the rest of the portfolio.
EUR is a dummy for denomination of asset a in euro.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 7: Sector Heterogeneity for Investment Fund Shares

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	ICPF (1)	**OFI** (2)	**MFI** (3)	**NFC** (4)	**HH** (5)	**ICPF** (6)	**OFI** (7)	**MFI** (8)	**NFC** (9)	**HH** (10)
$val^{tot}_{a,j,t}$	0.374***	0.439***	0.322***	0.287***	0.196***					
	(16.13)	(15.61)	(4.70)	(10.33)	(6.94)					
$val^{tot}_{a,j,t}$ * EUR	-0.0468	-0.0887	-0.234***	-0.0405	0.0199					
	(-1.02)	(-1.51)	(-3.10)	(-1.02)	(0.50)					
$val^{p}_{a,j,t}$						0.342***	0.377***	0.196***	0.247***	0.159***
						(14.49)	(13.71)	(4.19)	(8.52)	(6.21)
$val^{fx}_{a,j,t}$						0.184***	0.409***	0.930***	0.253***	0.260***
						(3.20)	(4.59)	(3.95)	(2.74)	(4.79)
N	5328918					1601033				
Country-Sector FE	x	x	x	x	x	x	x	x	x	x
ISIN FE	x	x	x	x	x	x	x	x	x	x
SECTOR * EUR	x	x	x	x	x					

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in t − 1: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ *is the total change in valuation of asset a in time t relative to the rest of the portfolio.*
$val^{p}_{a,t}$ *is the change in valuation due to price changes of asset a in time t relative to the rest of the portfolio.*
$val^{fx}_{a,t}$ *is the change in valuation due to exchange rate changes of the currency of denomination of asset a in time t relative to the rest of the portfolio.*
EUR is a dummy for denomination of asset a in euro.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 8: Country Heterogeneity

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	Non-Stressed	Stressed	Non-Stressed	Stressed	Non-Stressed	Stressed
$val^{tot}_{a,j,t}$	0.0766***	0.0370**	0.104***	0.0254*		
	(8.25)	(2.53)	(13.82)	(1.66)		
$val^{tot}_{a,j,t}$*EUR			-0.0778***	0.0311		
			(-3.35)	(1.40)		
$val^{p}_{a,j,t}$					0.0732***	-0.0103
					(10.46)	(-0.72)
$val^{fx}_{a,j,t}$					0.422***	0.348***
					(8.05)	(7.24)
N	22190248		22190248		8148734	
Country-Sector FE	x		x		x	
ISIN FE	x		x		x	

Notes: Stressed countries are Greece, Italy, Portugal, Spain, the rest is in the Non-Stressed group.
The dependent variable is transactions of asset a in time t scaled by its holdings in t − 1: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ *is the total change in valuation of asset a in time t relative to the rest of the portfolio.*
$val^{p}_{a,t}$ *is the change in valuation due to price changes of asset a in time t relative to the rest of the portfolio.*
$val^{fx}_{a,t}$ *is the change in valuation due to exchange rate changes of the currency of denomination of asset a in time t relative to the rest of the portfolio.*
EUR is a dummy for denomination of asset a in euro.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 9: Macroeconomic Outlook

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	All	EUR	FOREIGN		Pos. Dummy	Neg. Dummy
$val^{tot}_{a,j,t}$	0.071***	0.033	0.105***		0.106***	0.028
	(6.565)	(1.517)	(10.146)		(6.842)	(1.324)
$\Delta GDPForecast_t$	0.023	0.032	0.009	0.010		
	(1.597)	(1.494)	(0.897)	(1.287)		
$val^{tot}_{a,j,t} * \Delta GDPForecast_t$	0.036	0.019	0.118***			
	(1.125)	(0.284)	(4.089)			
$val^{p}_{a,j,t}$				0.059***		
				(6.159)		
$val^{fx}_{a,j,t}$				0.505***		
				(11.597)		
$val^{p}_{a,j,t} * \Delta GDPForecast_t$				0.052*		
				(1.851)		
$val^{fx}_{a,j,t} * \Delta GDPForecast_t$				0.448***		
				(5.421)		
N	20,364,381	13,782,544	6,580,963	6,583,700	10,332,088	9,631,246
Country-Sector FE	x	x	x	x	x	x
ISIN FE	x	x	x	x	x	x

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in t − 1: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ *is the total change in valuation of asset a in time t relative to the rest of the portfolio.*
$\Delta GDPForecast_t$ *is the percentage change in 5 year annual GDP growth forecast (WEO) for the issuing country of asset a in time t.*
Column (2) and (3) only include euro denominated and foreign currency denominated securities, respectively.
Column (4) and (5) only include the sample where the 5 year annual GDP growth forecast (WEO) has been revised upwards and downwards, respectively.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 10: Investment Patterns and Non-Linearities

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	DEBT		ALL ASSET CLASSES				
	All Securities		All Securities			Non-euro Securities	
	High Quality	Low Quality	$val^{tot}_{a,j,t} > 0$	$val^{tot}_{a,j,t} < 0$	All		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$val^{tot}_{a,j,t}$	0.219***	0.0778***	0.103***	-0.0618	0.228*	0.0838***	0.0942***
	(4.52)	(4.15)	(2.59)	(-1.48)	(1.96)	(10.55)	(10.70)
$val^{tot}_{a,j,t}$ * Stark Pr Movement>0					-0.108		
					(-0.97)		
$val^{tot}_{a,j,t}$ * Stark Pr Movement<0					-0.234*		
					(-1.76)		
$val^{tot}_{a,j,t}$ * Stark FX Movement>0						0.0916***	
						(3.81)	
$val^{tot}_{a,j,t}$ * Stark FX Movement<0						0.0498**	
						(2.49)	
$val^{tot}_{a,j,t}$ * High Curr Exp							0.0123
							(0.84)
N	1905725	2031215	9447198	12166206	22190248	8144163	8144163
Country-Sector FE	x	x	x	x	x	x	x
ISIN FE	x	x	x	x	x	x	x

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in t − 1: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ *is the total change in valuation of asset a in time t relative to the rest of the portfolio.*
High Quality Securities are rated on the highest step of the ECB harmonised rating scale for ECAIs (Description on page 20)
EUR and USD are dummies for denomination in euro and US dollar, respectively.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 12: Robustness Tests

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	Debt		All Assets		
	Pre-APP	APP	Including Lag Values		
	(1)	(2)	(3)	(4)	(5)
$val^{tot}_{a,j,t}$	0.0901***	0.271***	0.0729***	0.101***	
	(3.62)	(7.26)	(5.84)	(11.20)	
$val^{tot}_{a,j,t}$*EUR	-0.202***	-0.332***		-0.0797***	
	(-2.71)	(-3.50)		(-2.61)	
$val^{p}_{a,j,t}$					0.0717***
					(7.82)
$val^{fx}_{a,j,t}$					0.304***
					(6.04)
$val^{tot}_{a,j,t-1}$			-0.00872	0.0164**	
			(-0.72)	(2.55)	
$va^{tot}_{a,j,t-1}$*EUR				-0.0710**	
				(-2.27)	
$val^{p}_{a,j,t-1}$					0.00330
					(0.59)
$val^{fx}_{a,j,t-1}$					0.121***
					(3.22)
N	2469327	9752109	18269733	18269733	6912047
Country-Sector FE	x	x	x	x	x
ISIN FE	x	x	x	x	x

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in t − 1: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ *is the total change in valuation of asset a in time t relative to the rest of the portfolio.*
$val^{p}_{a,t}$ *is the change in valuation due to price changes of asset a in time t relative to the rest of the portfolio.*
$val^{fx}_{a,t}$ *is the change in valuation due to exchange rate changes of the currency of denomination of asset a in time t relative to the rest of the portfolio.*
EUR and USD are dummies for denomination in euro and US dollar, respectively.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*

Table 11: Persistence

Dependent variable $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$

	(1)	(2)	only gains (3)	only losses (4)
$val^{tot}_{a,j,t}$	0.0144	0.0145	0.143***	-0.186***
	(1.41)	(1.41)	(5.05)	(-5.04)
$val^{tot}_{a,j,t}$ * Quarters of same VAL	0.0571***			
	(7.84)			
$val^{tot}_{a,j,t}$ * Quarters of VAL gains		0.0625***		
		(7.17)		
$val^{tot}_{a,j,t}$ * Quarters of VAL losses		0.0484***		
		(5.54)		
$val^{tot}_{a,j,t}$ * Dummy (Gain 1 Quarter)			-0.0856***	
			(-4.56)	
$val^{tot}_{a,j,t}$ * Dummy (Gains 2 Quarters)			0.118***	
			(4.15)	
$val^{tot}_{a,j,t}$ * Dummy (Gains 3 Quarters)			-0.0638*	
			(-1.83)	
$val^{tot}_{a,j,t}$ * Dummy (Gains >4 Quarters)			-0.121***	
			(-3.15)	
$val^{tot}_{a,j,t}$ * Dummy (Loss 1 Quarter)				0.220***
				(6.28)
$val^{tot}_{a,j,t}$ * Dummy (Losses 2 Quarters)				0.286***
				(7.65)
$val^{tot}_{a,j,t}$ * Dummy (Losses 3 Quarters)				0.347***
				(8.50)
$val^{tot}_{a,j,t}$ * Dummy (Losses >4 Quarters)				0.346***
				(7.72)
N	22190248	22190248	9817164	11775445
Country-Sector FE	x	x	x	x
ISIN FE	x	x	x	x

Notes: The dependent variable is transactions of asset a in time t scaled by its holdings in $t-1$: $\frac{Transactions_{a,t}}{Holdings_{a,t-1}}$
$val^{tot}_{a,t}$ is the total change in valuation of asset a in time t relative to the rest of the portfolio.
$val^{p}_{a,t}$ is the change in valuation due to price changes of asset a in time t relative to the rest of the portfolio.
$val^{fx}_{a,t}$ is the change in valuation due to exchange rate changes of the currency of denomination of asset a in time t relative to the rest of the portfolio.
EUR and USD are dummies for denomination in euro and US dollar, respectively.
t-values in brackets.
** significant at 10% level; ** significant at 5% level, *** significant at 1% level*
*All regressions are at the security level. Standard errors are clustered at the issuer country * quarter level.*