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The effect of political stability and confidence in economic policy on cross-border fixed income portfolio allocation

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Abstract

This thesis investigates the extent of home bias in bond portfolios in 20 countries, in the time period 2001 to 2016. In additional to traditional drivers of portfolio optimization, we consider the impact of the financial crisis, political stability and economic policy on cross-border fixed income allocation. The thesis is mainly based on data from the Coordinated Portfolio Investment Survey by the International Monetary Fund and Ifo World Economic Survey. In our investigation of home bias, we find a declining trend throughout the period. We find that the strongest drivers of cross-border bond portfolio allocation are rational portfolio optimization factors, the degree of underweight and diversification benefits. These results indicate that investors aim to reallocate their portfolio and close the distance between actual weights and optimal weights following the International Capital Asset Pricing Model to achieve a diversified portfolio. We find a significant negative relationship between cross-border bond portfolio holdings and political stability, and a significant positive relationship between cross-border bond portfolio holdings and confidence in economic policy.

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1. Introduction

In a fully integrated world where Purchasing Power Parity holds, Solnik (1974) and Sercu (1980) show that the International Capital Asset Pricing Model (ICAPM) of Sharpe (1964) and Lintner (1965) holds. According to this model, the optimal share invested in each country is equal to that country's market capitalization weight in the world index portfolio. This theory is driven by the logic of diversification, whereas equilibrium is achieved when all investors hold the same world market portfolio. However, due to market frictions in the real world, holding a portfolio biased towards more domestic assets, than the ICAPM predicts, may be optimal. In fact, it is well documented that investors tend to grossly overweight the proportion they invest in their domestic market, despite the known benefits of international diversification. Investors do not only overinvest in their home market, but they also invest most heavily in markets that are close to them (Portes & Rey, 2005). This phenomenon, known as the home bias, has been shown to hold for both individual and institutional investors, for equity and fixed income, and for most countries. Still, several studies have shown that there are risk and return advantages resulting from international diversification. For example, Levi and Lerman (1988) found that by diversifying across world bond markets, in the period between 1960 and 1980, a U.S. investor could have earned more than double the mean rate of return on a U.S. bond portfolio, at the same level of risk.

There is a large literature on equity portfolio home bias, however the literature investigating home bias in fixed income portfolios is much poorer. This is surprising, given the fact that global debt securities outweigh world stock market capitalization significantly (Fidora, Fratzscher, & Thimann, 2007). One possible driver of home bias could be political stability and confidence in economic policy. In their study, Burger and Warnock (2007) find that policies and laws matter for fixed income home bias, as countries with stable macroeconomic policies and strong creditor rights have more developed local bond markets which attract foreign investors. Furthermore, Kaminsky and Schmukler (1999) find that changes in sovereign debt ratings and economic outlook affect financial markets in emerging economies, with average yield spreads increasing 2% and average stock returns decreasing 1%, in response to a domestic downgrade. They find that future outlook is as least as important as ratings, and that there is a spillover effect where changes in ratings of bonds in one emerging market triggers changes in both yield spreads

and stock returns in other emerging countries, and that the effect of ratings and outlook is elevated during crises. Furthermore, Gala, Pagliardi & Zenios (2018) suggest that politics and policy are distinct, though interrelated, factors affecting the economy. Using novel measures of political stability and confidence in economic policy they find correlations in stock market returns and economic growth across developed and emerging markets. As politics and policies seem to be important channels that affect a country's economy, we are interested in investigating whether cross-border fixed income flows can be explained by changes in political stabilities and changes in confidence in economic policies.

For the 20 countries in our sample we find that the average home bias went from 0,69 to 0,60 (-14%) during the period of 2001-2016. Although there has been a reduction, the level remains relatively high and home bias seems to persist as a phenomenon. Furthermore, we find that average home bias increased during the financial crisis. We find a significant negative relationship between cross-border bond portfolio holdings and political stability, and a significant positive relationship between cross-border bond portfolio holdings and confidence in economic policy.

1.1 Thesis objective

The objective of this thesis is to examine the level of cross-border fixed income portfolio holdings for 20 selected countries, in the period between 2001 and 2016, and how they have changed during the financial crisis. Our contribution to the existing literature on home bias is to approach the phenomenon considering novel measures of political stability and confidence in economic policy, investigating how cross-border bond portfolio allocation may be affected by these factors. This is done by analysing the data, and testing the following hypotheses:

1. Did changes in political stability have a significant impact on cross-border fixed income portfolio holdings?
   Hypothesis 1: "*Fixed income portfolio flows from country i to country c have a significant relationship with country c's political stability"*
2. Did changes in confidence in economic policy have a significant impact on cross-border fixed income portfolio holdings?

Hypothesis 2: *"Fixed income portfolio flows from country i to country c have a significant relationship with country c's confidence in economic policy"*

The outline of the paper is as follows. Section 2 provides the background literature review on home bias and proposed determinants. Section 3 describes the methodology we use in our thesis. Section 4 presents the data and its descriptive statistics. The empirical analysis and conclusion are found in section 5 and 6 respectively.

2. Background information and literature

Home bias is mentioned frequently in equity investing. However, it is even more prominent in fixed income portfolios. For example, studies show that the average U.S investor allocated only 10% of their fixed income portfolio to international markets (Coeurdacier & Rey, 2013). According to Modern Portfolio Theory, adding foreign securities to a domestic portfolio can shift its efficient frontier in such a manner as to increase total returns, lower volatility, or both. Hence, investors can reap benefits, such as opportunities for higher yields and lower duration, by diversifying across countries (Levi & Lerman, 1988). Studies show investors are increasingly aware of these benefits, as home bias, for both equity and fixed income, has been decreasing in the past years, although still prevailing (Coeurdacier & Rey, 2013). Besides benefits for the individual investor, there are two widely accepted economic benefits of financial integration – better sharing of risk and increased potential for higher economic growth (De Santis and Gérard, 2006). In this section we present possible drivers of home bias, mentioned in previous research.

2.1 Home bias determinants

In the literature, several theories have been suggested to explain the home bias in investors' portfolios. The clear majority of the research on home bias has been focused around equity, which has some applicability to bond home bias. Most explanations for home bias build on the realization that there are frictions in the markets. Trade constraints, exchange rate risk and information asymmetries due to barriers to information flow and language barriers are among the suggested explanations. For instance, De Santis and Gérard (2006) write that some countries

impose restrictions on the foreign holdings of their nationals or on the domestic holdings of foreign nationals.

Over the last years, mainly due to the evolution of the internet, foreign investment transaction costs have decreased drastically, and information flow has increased significantly. The establishment of the Economic and Monetary Union (EMU) played a key role in the reallocation of capital among countries worldwide, enhancing financial integration and international risk sharing (De Santis & Gérard, 2009). Investors in most countries can now invest abroad through mutual funds and even direct ownership of foreign shares more easily than they ever could. Some studies, such as Levy and Levy (2014) question the use of the term home bias to whether or not this phenomenon actually is a bias. They argue that there are rational explanations for investors to hold more domestic assets than the ICAPM on average predicts to be optimal, and argue that the wording bias is deceptive as there are various economic advantages to investing domestically.

French and Poterba (1991) argue that home bias in investors' portfolios stems from irrational behaviour. They find that investors expected returns in their domestic equity market to be several hundred basis points higher than those in other markets. They argue that investors perceive portfolios abroad to be riskier and show that investors hold a disproportionate amount of domestic assets in their equity portfolios. Furthermore, French and Poterba show that the lack of diversification is largely due to investor choices, rather than institutional constraints.

Tesar and Werner (1995) have examined to what extent transaction costs associated with investing abroad could harm the actual benefits from international diversification. They argue that the cost associated with transactions should be negatively related to the number of transactions undertaken in the market. Their findings reveal that the turnover rate on foreign equity is higher than on domestic equity. Warnock (2002) does another study of this kind. His findings show a lower foreign turnover rate to that of the domestic, but not enough to reject the hypothesis that transaction costs are explaining only a small portion of the observed equity home bias.

The Capital Asset Pricing Model assumes that all relevant information is available and thus agents should have homogeneous expectations. O'Hara (2003) argues that information asymmetries lead less informed investors to have a different optimal portfolio than well informed investors, whereas less informed investors

typically hold a larger portion of safer assets. Correspondingly, Coval and Moskowitz (2001) show that American fund managers got better returns investing in companies that are geographically close to them, indicating a rational explanation for the home bias, in the sense that investors have more information on domestic and related assets.

Gelos and Wei (2005) find clear evidence that both government and corporate transparency have distinct positive effects on investment flows from international funds into a specific country. In addition, they find that during crises, capital flight is greater in the least transparent countries. They suggest that becoming more transparent, for example increasing the level of financial disclosure and availability of information about companies, is an effective way for countries to benefit from international financial integration and attract foreign investors.

Exchange rate risk is another possible driver of home bias. Fidora, Fratzscher and Thimann (2007) find that real exchange rate volatility can explain about 20% of the cross-country variation in equity and bond home biases, by using a Markowitz-type ICAPM which incorporates real exchange rate volatility as stochastic deviations from purchasing power parity. Furthermore, they find that bond home bias is more pronounced than equity home bias. Fidora, Fratzscher and Thimann (2007) show that a reduction of the monthly real exchange rate volatility from its sample mean to zero, reduces bond home bias by around 60%, while it reduces the equity home bias by only 20%. Given a mean-variance optimization which implies risk aversion of investors, an implication of the model is that home bias in assets with relatively high local currency return volatility should respond less to real exchange rate volatility than home bias in assets with low local currency return volatility. This means that in the presence of real exchange rate volatility home bias should be higher for assets with lower local currency return volatility. The rationale is that if return volatility of a foreign asset is low, real exchange rate volatility makes a relatively higher contribution to real return volatility of this asset, when measured in domestic currency, and contrariwise. Overall, this indicates that home bias should be higher for bonds than for equities as bond returns typically are less volatile than equity returns. Therefore, a reduction of exchange rate volatility should have a larger impact on bond home bias than on equity home bias. They show compelling empirical support for these theoretical hypothesises. Their

findings underline the overall importance of including exchange rate volatility as a control variable when modelling portfolio choices and home bias.

Currency matching rules, which are a form of restriction on the level non-domestic investments for portfolio funds, are amongst other things, set to ensure that foreign currency risk is reduced. De Santis and Gérard (2009) write that the introduction of the euro in 1999, led to greater flexibility and better diversification, as the intra-euro area currency matching rule shifted from national currencies to the euro. They find that, euro area portfolio assets as a share of total international asset holdings of euro area residents increased by 16% for equities, and 45% for fixed income securities. This suggests that the introduction of the euro, and reduction of exchange rate risk might have strongly stimulated portfolio transactions between the euro area countries. However, this evidence precedes the financial crisis, which may have changed market dynamics.

Some of the suggested explanations for home bias in equities might not be as good of explanations for fixed income home bias, while some might even be more important in explaining the observed fixed income home bias. Fixed income instruments are typically considered safer than equities, and its main risks differ from those of equities. The primary risks concerning fixed income investing are linked to default risk. In addition, fixed income investors are also faced with secondary market liquidity risk, as well as exchange rate risk for international or governmental instruments and interest rate risk for securities with longer maturities. Fama and French (1993) find that most of the variation in returns on government and corporate bond portfolios arises from unexpected changes in interest rates and a default premium.

2.2 Financial crisis

Several years before the financial crisis of 2008, the world experienced increasing financial integration, which was mostly led by flows to and from advanced economies. Milesi-Ferretti and Tille (2011) identify the main drivers behind the collapse in international capital flows following the financial crisis. Amongst other things they show that international banking flows, particularly among advanced economies, played a central role, both in the pre-crisis globalization and in the retrenchment following the crisis. They show that the broad reversal in international capital flows, materialised after the fall of Lehman

Brothers, and was mostly pronounced in banking flows. Further, they argue that the impact of the crisis on a specific country depends on the extent of its international financial linkages, its macroeconomic conditions and its dependence on world trade. They reason that countries with large pre-crisis external debt levels were hit with a deeper retrenchment of flows during the most acute phase of the crisis. They conjecture that the trend to financial globalization will persist but at different paths for developed and emerging markets, as the magnitude of impact of the financial crisis differ substantially.

Giannetti and Laeven (2011) provide similar evidence from the syndicated bond markets, and further argue that this flight home effect coexists with, but is distinct from, the flight to quality effect. They show that home bias becomes more severe when investors experience negative shocks and refer to this as the flight home effect. Several other studies show similar evidence (Forbes and Warnock, 2012; Fratzscher, 2012).

Wynter (2012) presents a contrasting view, and argues that home bias was reduced in 2008. However, he uses a methodology, where he decomposes the change in allocation into its active component due to trades that investors made, and passive component caused by differential returns and exchange rates. He finds that in 2008, the active change in the foreign portfolio share was -1.02%, which is consistent with the retrenchment literature, however the passive change was much larger, 4.64%.

2.3 Political stability and economic policy

Fidora, Fratzscher and Thimann (2007) argue that exchange rate volatility introduces a macroeconomic policy dimension into the considerations of international financial integration. They suggest that it is an interesting issue to explore whether the move away from the gold standard and towards floating exchange rates, which holds true for many industrial economies, and increasingly emerging markets, entails a potential cost for financial integration, as exchange rate volatility is increased in the short term. They argue that the importance of the exchange rate underscores the rationale for overall macroeconomic and monetary stability. Furthermore, they argue that overall uncertainty and risk, whether stemming from economic, political or other sources may explain an important part of the pattern of global financial integration.

Gala, Pagliardi and Zenios (2018) were the first to disentangle the effects of politics and policy. They use 42 different countries' measures of political stability and confidence in economic policy by employing the Ifo World Economic Survey database of expert's surveys, and establish portfolios which exhibit large and significant differences in average returns. They find that political stability and confidence in economic policy predicts the cross section of country returns and economic growth, with structural differences for emerging and developed markets. Whereas improvements in politics and policy forecast large positive stock market returns for developed markets, the same improvements exhibit negative returns for emerging markets. In addition, they document that the cross-country return heterogeneity is mainly due to abnormal returns, regardless of the referenced international asset pricing model. They conclude their study by suggesting that there may be a causal link between politics and policy and future stock market returns, or that it may be driven by endogenous factors caused by some unobserved country characteristics.

Burger and Warnock (2007) find that U.S. investors avoid local currency bond markets that have returns with high variance and negative skewness, features often found in emerging markets. They argue that if macroeconomic instability is owed to domestic policies, an improvement in policies can lead to desirable return characteristics which attract foreign investors.

3. Methodology

The aim of this thesis is to examine the level of cross-border fixed income portfolio holdings for 20 countries, in the period between 2001 and 2016, whether these were affected by political stability and confidence in economic policy, and how they have changed after the financial crisis. This is done by testing the hypotheses stated in section 1.1. The significant coefficients from the regressions in section 3.6 will help us understand the impact of political stability and confidence in economic policy on cross-border diversification decisions of investors. For more information regarding calculation of the variables in the regressions see Appendix 3.

3.1 Home bias measure

To document the extent of bond home bias in the period 2001 to 2016, we follow De Santis and Gérard (2006), and use their measure of bond home bias, $BHB_{i,t}$, defined as one minus the Foreign Asset Acceptance Ratio (FAAR):

$$BHB_{i,t} = 1 - \frac{Share\ of\ Foreign\ Bonds\ in\ Country\ i\ Bond\ Holdings\ in\ year\ t}{Share\ of\ Foreign\ Bonds\ in\ the\ World\ Bond\ Market\ in\ year\ t}$$

$BHB_{i,t}$ is the difference between actual holdings and optimal holdings of domestic bonds in the world market portfolio. When the bias measure for country *i*, is equal to one, there is full bond home bias. When it is equal to zero, the portfolio is optimally diversified according to the ICAPM. De Santis and Gérard (2006) mention that the presence of home bias is an indication that financial integration is not complete. However, they point out that some investors may have good reasons for investing in domestic assets rather than foreign, under certain conditions (also mentioned in the literature review, and pointed out by IMF in 2005). Furthermore, they mention that FAAR index has limitations in that it only considers the market in which a firm is listed, even if the firm is global in scope. Thus, the FAAR index may understate the overall degree of actual diversification of investors in highly international markets. We calculate equal-weighted averages of home bias within our sample of countries.

To measure the degree of home bias, we calculate the total bond portfolio of each country, each country's bond market capitalization and the domestic bond holdings for each country in the dataset. This is done by using the following relation:

$$C_{i,t} = D_{i,t} - A_{i,t} + B_{i,t} = E_{i,t} + B_{i,t}$$

Where $A_{i,t}$ is the market capitalization of total foreign bond holdings in country *i*, $B_{i,t}$ is the market capitalization of country *i's* total bond holdings abroad, $C_{i,t}$ is the market capitalization of the total bond portfolio, $D_{i,t}$ is the domestic bond market value and $E_{i,t}$ is the market capitalization of domestic bond holdings for each country i at year t. $A_{i,t}$ and $B_{i,t}$ are extracted from the CPIS dataset, and $D_{i,t}$ is extracted from BIS, while $E_{i,t}$ and $C_{i,t}$ are calculated, for the period 2001-2016.

Next, we calculate both the share of foreign bonds in country *i*'s bond holdings ($W_{i,t}$), and the optimal share of foreign bonds in the world market portfolio ($W_{i,t}{}^{*}$) using the following formulas:

$$W_{i,t} = \frac{B_{i,t}}{C_{i,t}}$$

$$W_{i,t}{}^{*} = \frac{\sum_j D_{j,t} - D_{i,t}}{\sum_j D_{j,t}}$$

Not all countries participate in BIS, and there are limitations to data for domestic bond market values, hence $\sum_j D_{j,t}$ is the sum of domestic bond markets of the countries in sample.

The degree of home bias for country *i* can then be expressed in a more compact way than the previous formulation:

$$BHB_{i,t} = 1 - \frac{W_{i,t}}{W_{i,t}{}^{*}}$$

We adopt this methodology for the 20 countries that we chose to include in our analysis.

3.2 Active investments and degree of underweight

Using CPIS data, we are able to measure actual bond holdings of country *i* in country *c* by using the following formula:

$$w_{ic,t} = \frac{Inv_{ic,t}}{B_{i,t}}$$

Where $w_{ic,t}$ denotes the weight of country *i*'s investment in country *c* ($Inv_{ic,t}$) out of its total foreign investments ($B_{i,t}$), in year *t*.

A change in portfolio weights can be decomposed into a passive component, which results from differences in returns, and an active component due to trades by investors. We disentangle each component using the method adopted by De Santis and Gérard (2009). The total change in portfolio weights will be computed as follows:

$$\Delta w_{ic,t}^{Total} = w_{ic,t} - w_{ic,t-1}$$

The change in the weight of the active component:

$$\Delta w_{ic,t}^{Active} = w_{ic,t} - w_{ic,t-1}\frac{\left(1 + r_{c,t}^{i}\right)}{\sum_c\left(1 + w_{ic,t-1}\, r_{c,t}^{i}\right)} = w_{ic,t} - w_{ic,t-1}\frac{\left(1 + r_{c,t}^{i}\right)}{\left(1 + r_{Pi,t}^{i}\right)}$$

Where $r^i_{c,t}$ is the return on investment *c* and $r^i_{Pi,t}$ is the total return on country *i*'s foreign portfolio. Hence, the change in the weight of the passive component:

$$\Delta w^{Passive}_{ic,t} = \Delta w^{Total}_{ic,t} - \Delta w^{Active}_{ic,t}$$

The degree of underweight (DW), defined by De Santis and Gérard (2009) as the difference between the optimal weights and the actual weights, reveals the initial misallocation to the destination country. Portfolio rebalancing that takes place to correct this misallocation, and to shift the weights towards the optimal, is a rational investment decision made by investors. Therefore, we include the initial degree of underweight as an independent variable. To measure DW, we once more follow De Santis and Gérard (2009) approach:

$$DW_{ic,t} = w^*_{ic,t} - w_{ic,t}$$

Where $DW_{ic,t}$ is the degree of underweight, $w^*_{ic,t}$ is the optimal share that should have been invested by country *i* in country *c* bond holdings according to the ICAPM, and $w_{ic,t}$ is the actual weight invested.

3.2 Diversification benefits

A rational consideration for investors is to adjust portfolio weights based on expectations for excess returns and each asset's contribution to the overall portfolio risk. To disentangle these marginal diversification benefits as well as currency risk we adopt De Santis and Gérard's (2009) approach. They express the marginal impact on portfolio risk of changing the position in a particular asset using the foreign investment portfolio variance, $\sigma^2_{P_{i,t}}$, and express the measure of diversification benefit as:

$$DB_{ic,t} = -\frac{\delta}{\delta w_{ic,t}}\left[w'_{i,t}\Sigma_{i,t}w_{i,t}\right] = -2\sum_{l=1}^{K} w_{il,t}\sigma_{lc,t}$$

$DB_{ic,t}$ measures the diversification benefit of adding asset *c* to investor *i*'s portfolio. The term $\left[w'_{i,t}\Sigma_{i,t}w_{i,t}\right]$ is the foreign investment portfolio variance, $\sigma^2_{P_{i,t}}$. Portfolio risk is reflected in changes in the covariance matrix of returns. The covariance matrix is estimated annually by using monthly returns.

Variation in foreign assets' risk stems both from the pure asset component and the exposure to different exchange rates. By incorporating this measure of

diversification benefits, we take both the pure asset and exchange rate component into account.

3.3 The impact of the Economic and Monetary Union

The establishment of the Economic and Monetary Union (EMU) played a key role in enhancing financial integration, particularly due to elimination of currency risk (De Santis & Gérard, 2009). Therefore, we include a binary variable $DEMU_{ic}$, which equals 1 when both the investor and the host country are from the EMU, which captures the impact of the EMU. Additionally, $DEMU_{ic}$ incorporates the exchange rate component as mentioned under diversification benefits.

3.4 Political stability and confidence in economic policy

Gala, Pagliardi & Zenios (2018) find that political stability and economic policy are two distinct factors that affect equity returns. To capture the potentially distinct effects of political stability and confidence in economic policy on cross-border fixed income flows, we include political stability as an independent variable ($PS_{c,t}$), in the main regression, as well as confidence in economic policy ($CEP_{c,t}$).

3.5 Additional controls

Additional controls typically used in the portfolio flow literature are added as independent variables. Previous research has shown that international portfolio flows have a positive relationship with lagged returns. Therefore, both current returns ($\mathrm{Cret}_{c,t}$), and lagged returns ($\mathrm{Lret}_{c,t}$) of country *c* are included as regressors. To control for the size of the economy of the countries we examine, we include $GDP_{c,t}$ (the logarithm of GDP in millions of U.S. dollars) as an explanatory variable. Lastly, we add two proxy variables to control for geographical closeness between markets, $DIST_{ic}$ the logarithm of the distance in kilometres between two capital cities, and a dummy variable $BORD_{ic}$ which is equal to one when country *i* and *c* share a border (including maritime borders).

3.6 Regression specifications

To understand the impact of political stability and confidence in economic policy on cross border diversification decisions of investors, the following regression specifications are estimated and interpreted:

Specification 1a:

$$\Delta w_{ic,t}^{Active} = \alpha_0 + \beta_1 DW_{ic,t-1} + \beta_2 DB_{ic,t-1} + \beta_3 \mathrm{Cret}_{c,t} + \beta_4 \mathrm{Lret}_{c,t} + \beta_5 GDP_{c,t} + \beta_6 DIST_{ic} + \theta_1 DEMU_{ic} + \theta_2 BORD_{ic} + \varepsilon_{c,t}$$

Specification 2a:

$$\Delta w_{ic,t}^{Active} = \alpha_0 + \beta_1 DW_{ic,t-1} + \beta_2 DB_{ic,t-1} + \beta_3 \mathrm{Cret}_{c,t} + \beta_4 \mathrm{Lret}_{c,t} + \beta_5 GDP_{c,t} + \beta_6 DIST_{ic} + \theta_1 DEMU_{ic} + \theta_2 BORD_{ic} + \gamma_1 PS_{c,t} + \gamma_2 CEP_{c,t} + \varepsilon_{i,t}$$

Specification 1b:

$$\Delta w_{ic,t}^{Active} = \alpha_0 + \beta_1 DW_{ic,t-1} + \beta_2 DB_{ic,t-1} + \beta_3 \mathrm{Cret}_{c,t} + \beta_4 \mathrm{Lret}_{c,t} + \beta_5 GDP_{c,t} + \beta_6 DIST_{ic} + \theta_1 DEMU_{ic} + \theta_2 BORD_{ic} + \theta_3 FinC_t + \varepsilon_{i,t}$$

Specification 2b:

$$\Delta w_{ic,t}^{Active} = \alpha_0 + \beta_1 DW_{ic,t-1} + \beta_2 DB_{ic,t-1} + \beta_3 \mathrm{Cret}_{c,t} + \beta_4 \mathrm{Lret}_{c,t} + \beta_5 GDP_{c,t} + \beta_6 DIST_{ic} + \theta_1 DEMU_{ic} + \theta_2 BORD_{ic} + \gamma_1 PS_{c,t} + \gamma_2 CEP_{c,t} + \theta_3 FinC_t + \varepsilon_{i,t}$$

Where $DW_{ic,t-1}$ represents the degree of underweight in the preceding year, $DB_{ic,t-1}$ is the measure of diversification benefits, $DEMU_{ic}$ is the EMU dummy. $PS_{c,t}$ represents political stability and $CEP_{c,t}$ represents confidence in economic policy of country *i*. In addition, $FinC_t$ dummy is added to capture the impact of the financial crisis, and is equal to 1 for *t* = 2008, 2009. $\mathrm{Cret}_{c,t}$ and $\mathrm{Lret}_{c,t}$ capture the effect of current and lagged returns, and $GDP_{c,t}$ controls for the size of the economy of country *c*, $DIST_{ic}$ and $BORD_{ic}$ control for closeness between markets. The data and regression analysis are handled using Microsoft Excel and Matlab.

4. Data

This section describes the data used in this thesis, and includes an explanation about the selection process, where it was collected, and descriptive statistics.

The main datasets used in this thesis are the International Monetary Fund's Coordinated Portfolio Investment Survey (CPIS) used for bilateral bond flows, Ifo World Economic Survey (WES) used for statistics on political stability and confidence in economic policy, and debt securities statistics from Bank for International Settlements (BIS) used for finding debt market capitalization of the

countries in sample. Additional data on other variables were collected from sources like Global Financial Data and The World Bank.[1]

4.1 Sample selection

The sample used in the analysis consists of statistics for 20 countries in the time period 2001-2016. Ideally, we wanted to have a balance between developed and emerging markets, and to include as many countries in our analysis as in WES dataset, however, due to data restrictions in BIS, CPIS and bond returns, several countries were dropped from the analysis. BIS and bond market return data posed the most restrictions, and of 45 participating countries in BIS (in 2018), only 31 countries had complete information throughout our sample period. In the end, the 20 chosen countries represent roughly 80% of the reported bond market capitalization in BIS debt statistics (measured for 2018). Tax haven countries, such as Cayman Islands and Bahamas, where there are very low effective rates of taxation for foreign investors, were not included in our analysis, which may have skewed the results.

The time period was chosen to best match the available data, and to include as many years as possible. Previously employed datasets in the existing literature on capital flows have lacked consistency, hence previous studies of international and cross-border portfolio diversification are limited. Fortunately, CPIS now includes comprehensive data on international fixed income flows. In addition, we were interested in studying the extent of home bias in the aftermath of the financial crisis, therefore including several years following 2008 in the sample were of importance.

We find 2001-2016 to be an interesting time period in general. The evolution of the internet, computers and smartphones contributed to increased information flow and reduced transaction costs drastically. Mentioned previously, the establishment of EMU played a key role in the reallocation of capital among countries worldwide, enhancing financial integration and potentially international risk sharing (De Santis & Gérard, 2009). Many countries joined third stage of EMU following 1999. There have been different crises during this period, such as the dot-

[1] For more specific information regarding the data sources used to calculate the variables in the regression see Appendix 3.

com bubble of 2001 and the Chinese stock market bubble in 2007. Several countries experienced sovereign debt crises, such as Greece, Portugal and Spain. These factors may all have contributed to changes in home bias worldwide.

4.2 International Monetary Fund's Coordinated Portfolio Investment Survey

The CPIS is a data collection exercise conducted under the auspices of the International Monetary Fund (IMF), and survey results are freely available at IMF's website[2]. Economies voluntarily provide data on their holdings of portfolio investment securities, which consists of separate data for equity and debt instruments. The IMF augments the CPIS data with data from two additional surveys i.e. Securities Held as Foreign Exchange Reserves, and Securities Held by International Organizations. IMF states that these three surveys together provide estimates for portfolio investment liabilities for every economy in the world. In other words, CPIS provides a geographical breakdown of all international investment, excluding foreign direct investment.

De Santis and Gérard (2006) point out that the major advantage of this dataset is the consistency of compilation criteria. Participating economies undertake a benchmark portfolio asset survey at the same time, in addition to following the same definitions and classifications that are mutually consistent, as the methodology is set out by the IMF. Furthermore, the participants provide a breakdown of their portion of portfolio investment assets by country of residency of the non-resident issuer. Although CPIS represents a major advance in availability of data on bilateral investment positions, Lane and Milesi-Ferretti (2004) point out that the survey is far from perfect. They mention that holdings are surely under-reported by some countries and that bilateral data can be distorted by third-party holdings to the extent that final ownership of assets is not properly traced. Moreover, the survey offers relatively little information on the currency denomination of bonds.

At the end of 2001, $7,52 trillion were invested in foreign bonds. Ten countries – Japan, United States, Luxembourg, and seven euro area countries – held 66,8% of all international bond portfolio holdings. Similarly, many of these countries received a large portion of these investments. United States, Japan,

[2] Source: International Monetary Fund - http://data.imf.org/?sk=388DFA60-1D26-4ADE-B505-A05A558D9A42 (retrieved on April 11th, 2019)

Canada, Cayman Islands and six euro area countries, received 76,2% of all international bond portfolio investments. By 2017, investments in foreign bonds were dominated by most of the same countries as in 2001. United States, Japan, Luxembourg, Cayman Islands, and six euro area countries held 65,7% of all international bond portfolio holdings in 2017. Total investment in foreign bonds in 2017 amounted to $30,1 trillion. Among the recipients – United States, Japan, Canada, Cayman Islands and six euro area countries, received 73,8% of all international bond portfolio investments. These statistics are summarized in table 1.

Table 1

Summary statistics of international bond holdings, 2001-2017

Foreign bond holdings

Country	2001	% of world	Sum	Country	2017	% of world	Sum
World	*7 520 680 278 571,89*			*World*	*30 131 078 822 771,20*		
Japan	1 062 402 646 411,23	14,1 %		United States	3 273 676 000 000,00	10,9 %	
United Kingdom	745 665 144 000,00	9,9 %		Japan	2 472 353 049 513,01	8,2 %	
United States	690 936 466 129,30	9,2 %		Germany	2 427 846 186 364,08	8,2 %	
France	508 578 841 400,00	6,8 %		France	2 231 633 454 000,00	8,1 %	
Germany	501 521 056 729,65	6,7 %	66,9 %	Ireland	1 965 969 128 109,20	7,4 %	65,7 %
Italy	410 431 985 600,00	5,5 %		United Kingdom	1 905 172 001 000,00	6,5 %	
Ireland	312 550 028 007,85	4,2 %		Netherlands	1 311 883 148 930,00	6,3 %	
Netherlands	299 084 137 100,00	4,0 %		Switzerland	1 034 961 000 000,00	3,4 %	
Switzerland	250 646 126 500,00	3,3 %		Italy	1 012 840 031 800,00	3,4 %	
Belgium	246 885 950 326,05	3,3 %		P.R.: Hong Kong China	669 062 425 733,39	3,4 %	

Foreign bond investment recipients

Counterparty country	2001	% of world	Sum	Counterparty country	2017	% of world	Sum
World	*7 520 680 278 571,89*			*World*	*30 131 078 822 771,20*		
United States	2 077 456 809 714,46	27,6 %		United States	8 269 125 369 124,37	27,4 %	
Germany	895 303 642 445,77	11,9 %		United Kingdom	2 297 933 694 662,18	7,6 %	
United Kingdom	576 651 026 554,87	7,7 %		France	2 226 894 893 491,48	7,6 %	
Italy	459 911 926 169,02	6,1 %		Germany	1 952 832 260 715,56	7,4 %	
Netherlands	416 794 070 334,51	5,5 %	76,2 %	Netherlands	1 514 677 546 376,76	6,5 %	73,8 %
France	386 501 435 007,97	5,1 %		Italy	1 110 653 208 301,04	5,0 %	
Canada	318 594 975 460,29	4,2 %		Canada	1 035 082 033 732,56	3,7 %	
Japan	222 761 006 472,50	3,0 %		Japan	916 466 582 290,75	3,0 %	
Spain	208 238 263 535,79	2,8 %		Spain	821 821 184 337,73	2,7 %	
Belgium	171 818 642 541,20	2,3 %		Australia	796 526 837 473,96	2,7 %	

Source: International Monetary Fund's Coordinated Portfolio Investment Survey

4.3 Ifo World Economic Survey

The Ifo World Economic Survey (WES) is a survey of international experts conducted by the Ifo Institute for Economic Research, in corporation with the International Chamber of Commerce, and financial support from the European Commission[3]. The survey is designed to give an exact picture of the economic situation and outlook for important developed and emerging economies on a quarterly basis. WES differs from other official statistics, which are primarily based

[3] Source: Ifo Institute Center for Economic Studies - https://www.cesifo-group.de/ifoHome/facts/Survey-Results/World-Economic-Survey.html (retrieved on April 11th, 2019)

on quantitative information, by consisting of qualitative information, such as appraisals and expectations of economic experts. According to Ifo Institute, WES results are timely and internationally comparable. The survey results are accessible through Thomson Reuters DataStream.

Ifo Institute states that the experts who participate in the survey are well informed about economic developments. The absolute majority of WES panelists have completed a tertiary education, and over 40% have a Ph.D. About 16% are employed by financial institutions, 14% are affiliated with industrial firms and about 13% are representatives of associations or chambers of industry or trade. The remaining 25% work for national ministries or agencies, central banks, international organizations, embassies or are private independent consultants. Roughly half of the WES experts have a degree in economics. Around 19% have an academic background in business. The remaining are from professional and applied sciences, other social sciences, law or humanities. Participation is strictly voluntary, and Ifo states that the sole incentive for the experts' participation in the survey is purely a professional interest in the topic and the survey results.

Summary statistics of WES data for the sample period are given in Table 2. There is quite a bit of fluctuation in the variables over time, and, as expected, developed markets score higher on both political stability and confidence in economic policy, on average. The average score for political stability in developed markets is 6,79, and 4,77 for emerging markets, with standard deviations of 1,07 and 1,21, respectively. The most stable developed countries were Finland, Denmark, Switzerland and Austria. Italy and Belgium had the lowest stability scores. For emerging markets, Brazil and Chile were the most stable, while Thailand and Egypt were associated with low stability scores. The average score for confidence in economic policy is 45,29 for developed markets, and 29,53 for emerging markets, with standard deviations of 21,05 and 18,72 respectively. Amongst developed markets, Norway, Denmark and Canada have the highest scores, while Italy and Japan have the lowest. In emerging markets, China and Chile have the highest confidence in economic policy, while Taiwan, Egypt and Hungary are at the bottom fifteen percent.

Table 2

Summary statistics of political stability and confidence in economic policy, 2001-2016

	Developed markets					Emerging markets				
	Stability		Policy				Stability		Policy	
	Mean	StDev	Mean	StDev			Mean	StDev	Mean	StDev
Austria	7,71	0,62	50,31	19,83		Czech Republic	5,00	1,04	23,81	9,40
Belgium	5,64	1,74	42,44	19,72		Hungary	4,96	1,54	9,06	11,46
Denmark	7,85	0,68	74,65	17,06		Poland	5,65	1,09	26,00	19,73
Finland	8,01	0,86	60,93	25,52		Russia	4,87	0,75	20,58	11,15
France	6,73	1,08	22,63	18,68		Brazil	5,74	1,47	36,44	22,29
Germany	7,46	0,46	36,76	22,29		Chile	6,81	1,24	56,07	28,90
Greece	5,94	2,59	22,95	21,36		Colombia	4,60	1,30	54,92	17,39
Ireland	7,20	0,92	50,43	32,35		Mexico	4,73	0,72	24,29	9,59
Italy	4,41	1,27	18,71	16,62		Peru	3,93	1,54	39,06	23,49
Netherlands	6,88	1,06	52,05	19,07		Israel	4,07	1,73	27,18	21,83
Norway	7,31	1,18	78,26	18,67		Turkey	4,59	1,00	29,49	23,41
Spain	6,03	1,59	35,47	23,14		China	5,60	0,56	59,88	25,12
Sweden	7,18	1,01	63,80	25,22		India	5,28	1,03	34,42	20,20
Switzerland	7,74	0,78	70,91	15,12		South Korea	4,82	0,68	28,28	21,31
UK	6,81	1,11	43,46	26,79		Malaysia	4,57	1,33	33,40	23,22
Canada	7,16	0,71	73,03	17,46		Philippines	3,83	1,73	21,97	19,75
USA	6,86	0,76	30,37	17,31		Taiwan	4,23	1,21	5,90	9,66
Hong Kong	5,85	1,19	24,23	19,78		Thailand	3,41	1,45	18,30	19,45
Japan	5,87	0,89	17,21	15,34		Egypt	3,79	1,85	7,71	14,16
Australia	7,54	1,01	55,29	33,81		South Africa	4,93	0,98	33,96	22,91
New Zealand	7,11	0,64	51,98	25,23						
Portugal	6,14	1,50	20,43	12,83						
Averages	6,79	1,07	45,29	21,05			4,77	1,21	29,53	18,72

Source: Ifo Institute Center for Economic Studies

4.4 Debt securities statistics of Bank for International Settlements

BIS debt securities are used to find debt market capitalization of each country in sample. The data is accessible at BIS' website[4]. BIS covers borrowing activity in debt capital markets. The statistics capture debt instruments designed to be traded in financial markets, such as treasury bills, commercial paper, bonds, debentures and asset-backed securities, and distinguish between debt securities issued in international and domestic markets. Valuation methods differ across countries, so some amounts are presented at market value and others at nominal or face value. One drawback of BIS is that not all countries are represented in the dataset.

BIS consists of International debt securities (securities that are issued outside the local market of the country where the borrower resides) and domestic debt securities (issued in the local market of the country where the borrower resides). We use total debt securities, which are issued by residents in all markets.

[4] Source: Bank for International Statements - https://www.bis.org/statistics/secstats.htm (retrieved on April 11th, 2019)

Table 3 shows a breakdown of total debt securities by residency of selected markets for the period 2001-2018. BIS covers major economies, however, some economies' data is missing in the period of 2001-2008, such as the Philippines and Ireland. Of the participating countries, total debt securities increased threefold from 2001 to 2018. U.S., EU and Japan have decreased their shares in the global bond market from 2006 to 2018, meanwhile China increased its share by 10% during that period (Figure 1 and 2).

Table 3

Global Bond Market Capitalization 2001-2018

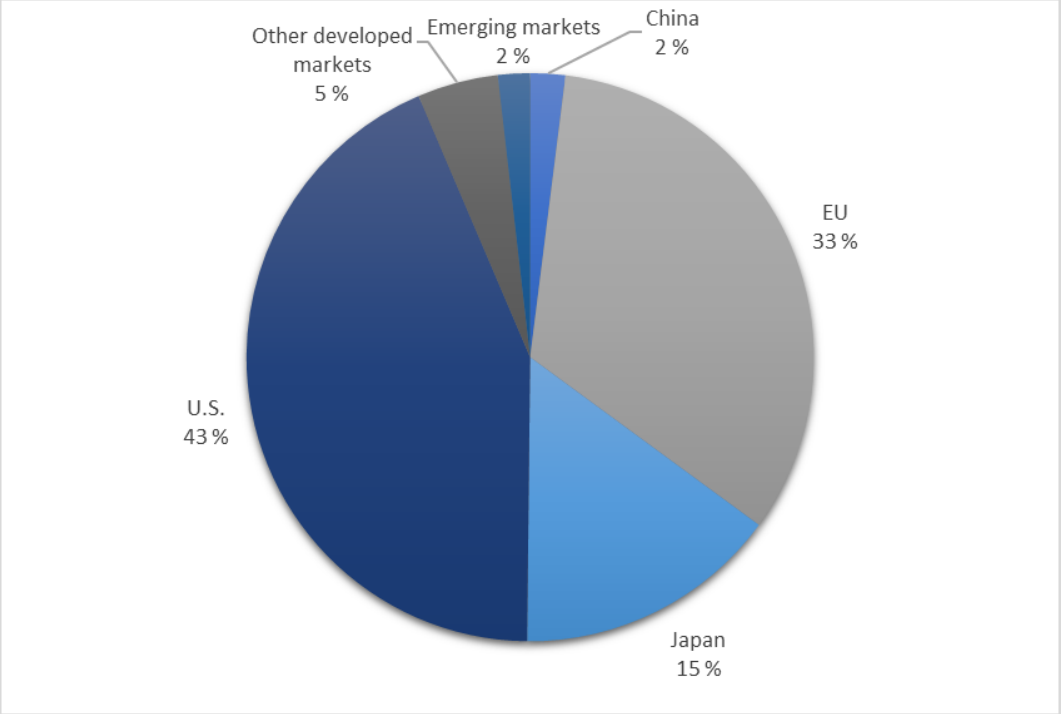
($ Billiards)

	Australia	Canada	China	EU	Japan	U.S.	Other developed markets	Emerging markets	Total
2001	364	890	251	9046	6301	17108	243	269	34473
2002	431	905	353	11323	7438	18397	295	385	39526
2003	610	1089	460	14565	8730	19879	338	447	46116
2004	733	1180	637	17076	9896	22372	385	717	52996
2005	770	1254	912	16346	9162	24084	403	971	53902
2006	957	1328	1198	19884	9090	26102	483	1098	60140
2007	1250	1544	1705	24018	9852	28698	580	1336	68982
2008	1140	1369	2228	24356	12330	30395	588	1271	73678
2009	1521	1669	2578	29379	12269	31261	770	1463	80909
2010	1738	1863	3065	28532	14604	32046	862	1697	84407
2011	1869	1960	3528	29051	15809	32698	919	1718	87554
2012	2031	2169	4294	30235	14719	33807	1091	1972	90318
2013	1873	2238	4961	30858	12349	34755	1165	2031	90230
2014	1913	2202	5835	28260	11179	36163	1163	1940	88655
2015	1816	2709	7753	25780	11240	37107	1115	1987	89506
2016	1813	2902	9409	24828	12031	38332	1162	2195	92671
2017	1982	3238	11757	28179	12694	39513	1342	2556	101260
2018	1875	3262	12416	27585	12620	40717	1381	2478	102334

Source: Bank of International Settlements

Figure 1

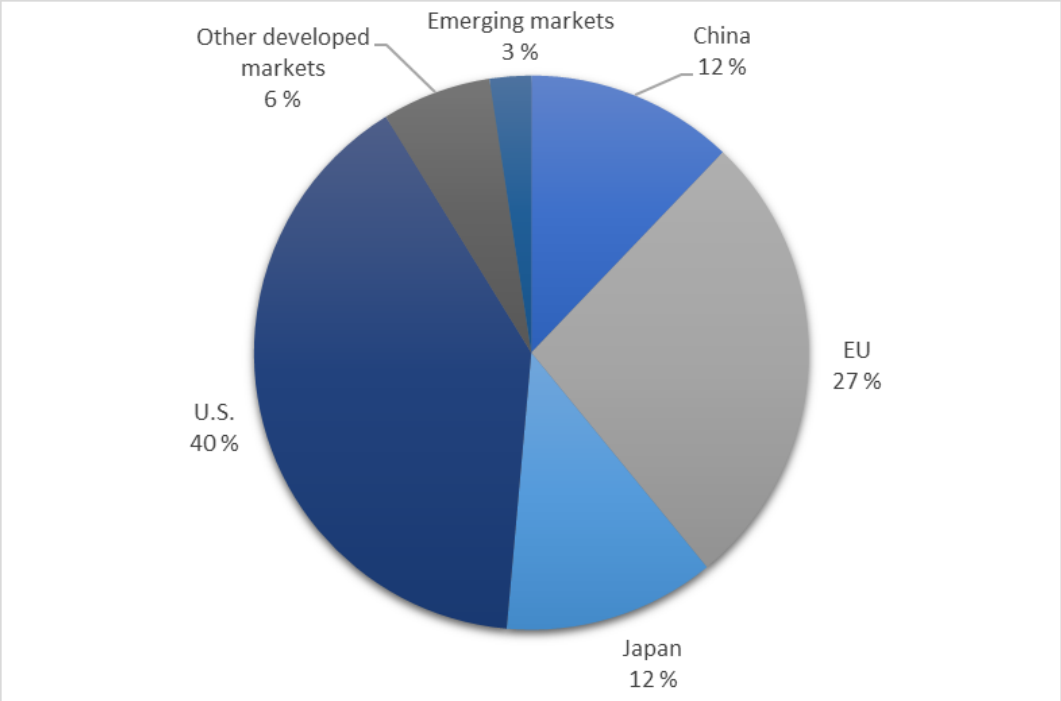
Global Bond Market Capitalization (2006 Q4) - $60,1 Trillion



Source: Bank of International Settlements

Figure 2

Global Bond Market Capitalization (2018 Q3) - $102,3 Trillion



Source: Bank of International Settlements

4.5 Correlation and collinearity

Most of the variables exhibit weak to no correlation, except for a few pairs. For instance, political stability and confidence in economic policy show a strong positive correlation of 0,58, and diversification benefits and lagged returns have a negative correlation of -0,42. Due to concern for multicollinearity, we run a Belsley collinearity test in Matlab. A commonly given rule of thumb is that variance decomposition factors of 10 or higher may be reason for concern. Other sources (Belsley, Kuh, & Welsch, 1980) suggest that the test's default tolerance of 30 is sufficient. The initial test shows that there appears to be multicollinearity in log GDP and log distance between capital cities. We are aware of multicollinearity's presence and consequences, however, to avoid specification error we decide not to drop any of the variables. Instead, we run a separate regression, where these variables are added together. After doing so, Belsley collinearity test in Matlab shows that there are no variables above the default threshold levels of variance decomposition factors. The full correlation matrix for the variables used in regressions, and the Belsley collinearity diagnostics can be found in Appendix 1 and 2 respectively.

5. Empirical analysis

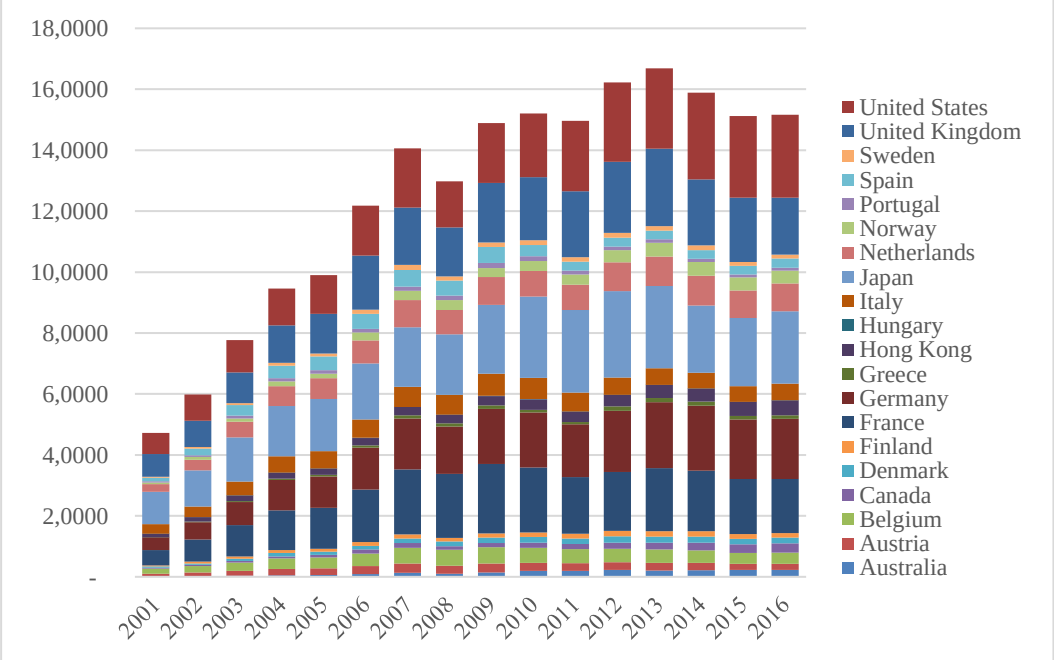
5.1 Sample characteristics

The 20 countries in our sample invested internationally 4,72 trillion US dollars in 2001. This represents 63% of total foreign fixed income portfolio holdings in the world that year. At the end of our sample period, in 2016, the total amount of foreign fixed income portfolio holdings of our countries amounted to 15,19 trillion US dollars, which accounts for 50% of total foreign fixed income portfolio holdings. We can see that foreign fixed income investments increased threefold during the examined years. Figure 3 displays the total foreign fixed income portfolio holdings of the countries, as well as the relative distribution amongst them. Japan, United Kingdom and United States were the three largest investors in foreign fixed income in 2001. United States and Japan were the largest in 2016, with Germany, United Kingdom and France holding large relative shares of foreign fixed income holdings.

Figure 3

Foreign fixed income portfolio holdings – sample countries

($ trillions)



Source: International Monetary Fund's Coordinated Portfolio Investment Survey

5.2 Fixed income home bias

Our estimates of the degree of home bias in the aggregate fixed income portfolios are shown below in table 4.

Table 4

Bond home bias	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	*%change*
Australia	0,94	0,94	0,92	0,90	0,89	0,86	0,86	0,89	0,87	0,85	0,85	0,85	0,85	0,85	0,84	0,83	*-12 %*
Austria	0,60	0,54	0,51	0,47	0,44	0,44	0,46	0,52	0,52	0,51	0,54	0,52	0,51	0,45	0,46	0,45	*-24 %*
Belgium	0,53	0,50	0,47	0,41	0,34	0,33	0,34	0,38	0,41	0,42	0,46	0,46	0,45	0,40	0,40	0,39	*-27 %*
Canada	0,96	0,95	0,95	0,93	0,91	0,88	0,87	0,89	0,89	0,89	0,89	0,87	0,87	0,84	0,87	0,86	*-10 %*
Denmark	0,84	0,86	0,84	0,81	0,80	0,80	0,80	0,81	0,80	0,79	0,79	0,77	0,77	0,75	0,73	0,73	*-14 %*
Finland	0,58	0,50	0,46	0,40	0,40	0,36	0,38	0,40	0,36	0,30	0,32	0,30	0,33	0,27	0,31	0,31	*-48 %*
France	0,64	0,59	0,54	0,52	0,48	0,44	0,46	0,49	0,46	0,47	0,53	0,53	0,52	0,49	0,49	0,49	*-23 %*
Germany	0,73	0,70	0,68	0,65	0,62	0,57	0,56	0,57	0,56	0,53	0,53	0,47	0,47	0,41	0,38	0,38	*-47 %*
Greece	0,84	0,78	0,61	0,48	0,41	0,50	0,47	0,57	0,61	0,79	0,85	0,57	0,54	0,48	0,48	0,37	*-56 %*
Hong Kong	0,32	0,31	0,27	0,26	0,27	0,24	0,24	0,23	0,30	0,31	0,35	0,35	0,35	0,37	0,36	0,38	*18 %*
Hungary	0,98	0,98	0,99	0,99	0,98	0,97	0,97	0,97	0,97	0,98	0,97	0,97	0,98	0,96	0,96	0,94	*-4 %*
Italy	0,75	0,76	0,74	0,73	0,69	0,72	0,75	0,77	0,77	0,77	0,81	0,83	0,84	0,81	0,79	0,78	*4 %*
Japan	0,85	0,85	0,85	0,85	0,83	0,82	0,82	0,85	0,83	0,83	0,84	0,82	0,80	0,82	0,82	0,82	*-3 %*
Netherlands	0,42	0,34	0,35	0,30	0,25	0,33	0,38	0,43	0,40	0,38	0,35	0,31	0,31	0,27	0,29	0,32	*-24 %*
Norway	0,53	0,51	0,48	0,43	0,42	0,32	0,33	0,32	0,45	0,43	0,40	0,40	0,36	0,32	0,30	0,30	*-44 %*
Portugal	0,53	0,47	0,42	0,33	0,24	0,34	0,38	0,41	0,41	0,58	0,70	0,71	0,71	0,65	0,65	0,66	*24 %*
Spain	0,64	0,53	0,49	0,50	0,46	0,52	0,60	0,66	0,70	0,79	0,83	0,85	0,84	0,80	0,77	0,76	*20 %*
Sweden	0,72	0,71	0,73	0,70	0,66	0,66	0,64	0,66	0,69	0,66	0,68	0,68	0,70	0,68	0,71	0,71	*-2 %*
United Kingdom	0,58	0,59	0,58	0,57	0,57	0,53	0,56	0,55	0,59	0,58	0,60	0,60	0,58	0,63	0,63	0,62	*8 %*
United States	0,91	0,90	0,90	0,89	0,89	0,87	0,86	0,90	0,88	0,87	0,86	0,85	0,85	0,84	0,84	0,84	*-8 %*
Average sample	**0,69**	**0,67**	**0,64**	**0,61**	**0,58**	**0,58**	**0,59**	**0,61**	**0,62**	**0,64**	**0,66**	**0,64**	**0,63**	**0,60**	**0,60**	**0,60**	***-14 %***

Home bias has, on average, declined from 0,69 to 0,60 (-14%) during our sample period. This level is still relatively high and home bias seems to persist as a

phenomenon. Most of the countries have exhibited a decrease in home bias, while five countries have exhibited an increase – Hong Kong (18%), Italy (4%), Portugal (24%), Spain (20%) and United Kingdom (8%). The investors of Finland, Germany, Greece and Norway have reallocated their fixed income portfolios into a much more globally diversified aggregated country portfolio as the home bias of these countries have decreased by 48%, 47%, 56 % and 44% respectively from 2001 to 2016. These heterogeneous observations make it interesting to explore the underlying drivers of fixed income home bias. We consider how active investor decisions have contributed to changes in home bias across our sample in section 5.3.

We look in further detail at what happened around 2007 to 2010 to investigate the impact of the financial crisis on fixed income portfolio allocation and its linkages to home bias.

Table 5

Bond home bias	2007	*%change*	2008	*%change*	2009	*%change*	2010
Australia	0,86	*3 %*	0,89	*-2 %*	0,87	*-2 %*	0,85
Austria	0,46	*12 %*	0,52	*1 %*	0,52	*-3 %*	0,51
Belgium	0,34	*12 %*	0,38	*8 %*	0,41	*2 %*	0,42
Canada	0,87	*2 %*	0,89	*1 %*	0,89	*-1 %*	0,89
Denmark	0,80	*1 %*	0,81	*-1 %*	0,80	*-1 %*	0,79
Finland	0,38	*7 %*	0,40	*-12 %*	0,36	*-17 %*	0,30
France	0,46	*6 %*	0,49	*-5 %*	0,46	*2 %*	0,47
Germany	0,56	*3 %*	0,57	*-3 %*	0,56	*-5 %*	0,53
Greece	0,47	*21 %*	0,57	*7 %*	0,61	*29 %*	0,79
Hong Kong	0,24	*-2 %*	0,23	*29 %*	0,30	*3 %*	0,31
Hungary	0,97	*0 %*	0,97	*0 %*	0,97	*0 %*	0,98
Italy	0,75	*3 %*	0,77	*0 %*	0,77	*0 %*	0,77
Japan	0,82	*4 %*	0,85	*-2 %*	0,83	*0 %*	0,83
Netherlands	0,38	*12 %*	0,43	*-7 %*	0,40	*-4 %*	0,38
Norway	0,33	*-3 %*	0,32	*37 %*	0,45	*-3 %*	0,43
Portugal	0,38	*6 %*	0,41	*2 %*	0,41	*41 %*	0,58
Spain	0,60	*11 %*	0,66	*6 %*	0,70	*12 %*	0,79
Sweden	0,64	*4 %*	0,66	*4 %*	0,69	*-4 %*	0,66
United Kingdom	0,56	*0 %*	0,55	*6 %*	0,59	*-2 %*	0,58
United States	0,86	*4 %*	0,90	*-2 %*	0,88	*-1 %*	0,87
Average sample	**0,59**	***5 %***	**0,61**	***3 %***	**0,62**	***2 %***	**0,64**

Table 5 shows how domestic bond holdings changed from year to year in the period from 2007 to 2010. We observe some patterns of a flight home effect, as the average home bias increased during the crisis. Giannetti and Laeven (2012) find that banks, when reducing foreign exposure in response to negative shocks, may

rebalance their portfolios towards more profitable domestic markets since the cost of negotiating and monitoring foreign debt holdings may be higher. Furthermore, they argue that banks with more domestic debt holdings may be more likely to be bailed out in the case of distress and banks attempt to maximize their bailout probability during a crisis. Our results are in line with the previous findings on home bias during the financial crisis (see for example Forbes and Warnock, 2012; Fratzscher, 2012; Milesi-Ferretti and Tille, 2011).

Fixed income and equity portfolio allocation has structural differences suggesting that equity home bias and fixed income home bias should not necessarily move in similar ways during a crisis. The flight to quality effect implies that fixed income assets should receive increased flows relative to equities, as investors sell what they perceive to be risky assets and purchase safer assets during periods of large negative shocks such as the financial crisis of 2008. We do not observe that, foreign fixed income assets received increased flows during this period, however we cannot draw a conclusion that a flight to quality effect were not present in the countries' domestic markets.

5.3 Cross-border fixed income portfolio allocation

We look at traditional drivers of investors' active portfolio allocations as well as a financial crisis-dummy, in addition to introducing two new possible drivers (political stability and confidence in economic policy). The results from our four cross-sectional regression specifications are presented in table 6. The table displays the coefficients and their significance in regard to change in active fixed income portfolio weights.

We have adopted the portfolio approach and the specification of some of the explanatory variables from De Santis and Gérard (2009) which includes variables that stem from rational portfolio optimization choices. In this regard it is worth mentioning that diversification benefits and the initial degree of underweight have a significant positive relationship with international portfolio reallocation across all specifications (both significant at the 1% level), which is in line with previous research on cross-country flows (see for example De Santis & Gérard, 2006). It is also worth noting that our results are in line with previous research that have shown a positive relationship between lagged returns and international portfolio flows on equities, which imply that also fixed income investors engage in

so-called positive feedback trading or trend chasing (see for example Froot, Connell and Seasholes (2001); Bohn and Tesar (1996); Brennan and Cao (2012)). This result indicates that investors allocate more towards foreign debt markets when they outperform domestic market. Additionally, our results remain similar across all specifications indicating the robustness of the model.

Table 6

Main regressions results

	Specification 1a	Specification 2a	Specification 1b	Specification2b
DW (t-1)	0.0281 ***	0.0286 ***	0.0282 ***	0.0287 ***
	[0.0027]	[0.0027]	[0.0027]	[0.0027]
DB (t-1)	0.0598 ***	0.060 ***	0.0596 ***	0.0602 ***
	[0.0119]	[0.0120]	[0.0119]	[0.0120]
Cret	-0.0111 ***	-0.0122 ***	-0.0110 ***	-0.0121 ***
	[0.0017]	[0.0017]	[0.0017]	[0.0017]
Lret	0.0055 ***	0.0051 ***	0.0054 ***	0.0050 ***
	[0.0019]	[0.0017]	[0.0019]	[0.0019]
GDP	-0.0055 ***	-0.0051 ***	-0.0056 ***	-0.0055 ***
	[0.0005]	[0.0004]	[0.0004]	[0.0004]
DIST	0.0013 **	0.0014 **	0.0013 **	0.0014 **
	[0.0000]	[0.0007]	[0.0005]	[0.0005]
DEMU	-0.0001	-0.0000	-0.0001	-0.0000
	[0.0005]	[0.0005]	[0.0005]	[0.0005]
BORD	0.0013 *	0.0014 *	0.0014 *	0.0014 *
	[0.0007]	[0.0007]	[0.000]	[0.0007]
PS		-0.0006 ***		-0.0006 ***
		[0.0001]		[0.0001]
CEP		0.0000 **		0.0000 **
		[0.0000]		[0.0000]
FinC			0.0013 **	0.0012 **
			[0.0006]	[0.0006]
Observations	5700	5700	5700	5700
Countries	20	20	20	20
Adjusted R-squared	0.0491	0.0512	0.0497	0.0518

Notes: Estimated coefficient results presented. Standard errors are in brackets.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Regression results, where $\Delta w_{ic,t}^{Active}$ is the active change in portfolio weights and the dependent variable, $DW_{ic,t-1}$ is the degree of underweight in the preceding year, $DB_{ic,t-1}$ is the measure of diversification benefits, $DEMU_{ic}$ is the EMU dummy. $PS_{i,t}$ represents political stability and $CEP_{i,t}$ represents confidence in economic policy of country i, $FinC_t$ is the financial crisis dummy. $Cret_{c,t}$ and $Lret_{c,t}$ are current and lagged returns, $GDP_{c,t}$ is the log of GDP for country c, $DIST_{ic}$ is the log distance between capital cities and $BORD_{i,c}$ is the border dummy.

The issue of explaining all aspects of active investment decisions at an aggregated level in one regression model is obviously at best a complex issue, and perhaps even impossible due to the nature of randomness in individual decisions. With this type of heterogeneity in cross-sectional data, one should not expect the model to capture all of the variation in the dependent variable, meaning that a low R-squared of the model to be expected. Our regression model specifications show R-squared values in the range of 0,0491 to 0,0518 which is in line with expectations for our type of dataset. We will in the following interpret the individual sign and significance of the independent variables of the model. The interpretations and the significance of these variables does not change based on the R-squared value.

We have included GDP as a control variable in the regression to account for the size of each country's economy. Our results show a negative relation for GDP with a significance level at 1 percent.

Distance and common border between markets are included as proxies for closeness between markets as earlier research have shown that investors tend to invest more heavily in markets that are close to them (Portes & Rey, 2005). Both of these variables have positive coefficients with significance level at 10 percent for border and 5 percent for distance. This result suggests that investors on the one hand reallocate more to countries that they share a border with. While on the other hand, they reallocate more towards countries that are distant. This result may be differing from previous research due to certain characteristics of our sample as it mostly consists of European countries with only a few distant countries (Australia, Canada, Hong Kong, Japan and the United States).

The dummy-variable for whether or not two countries both are members of the EMU has a significance level above 10 percent, indicating insignificance (in the main regressions) with respect to active investor reallocations. However, we run an additional regression specification where we find that DEMU is significant (see section 5.6).

Researchers have been studying the impact of the financial crisis on international capital flows extensively and many drivers behind the capital retrenchment following the crisis have been posed. Our result in specification 1b and 2b indicate that the financial crisis had a positive impact on active foreign portfolio reallocation, indicating that investors increased their active fixed income portfolio reallocations during the years of the financial crisis. It is interesting to note

that both overall home bias and investors active foreign portfolio reallocations increased during the crisis. One could argue that this was a rational response by investors who perceived dramatic changes in market structure, which in turn caused changes in risk aversion and expectations of future returns triggering investors to reallocate their portfolios.

5.4 The impact of political stability and confidence in economic policy

We introduce two new possible drivers of investors' active portfolio allocations with the intention of incorporating a political aspect into the analysis. Gala, Pagliardi and Zenios (2018) argue that political stability and confidence in economic policy are two distinct factors affecting equity returns. It is interesting to investigate whether these variables also affect international fixed income investors' active investment allocations.

Specification 2a and 2b (table 6) show that both political stability and confidence in economic policy are significant at minimum a 5% level (political stability on 1% and confidence in economic policy on 5%). The regression output indicates that investors make less active foreign fixed income portfolio reallocations as the political stability in the recipient country of these fixed income assets increases. The confidence in economic policy coefficient is significant and positive. The next step of our analysis involves pointing out some explanations for the dissimilar relations found between the recipient country's political stability and confidence in economic policy, and investors' active foreign portfolio reallocations.

The risk associated with these factors differs. Pagliardi and Poncet (2019) write that on one side, political risk relates to government instability and institutional and legal weaknesses. On the other side, economic policy risk concerns the ineffectiveness, inadequacy and inaptitude of economic changes or reforms implemented by a government. For instance, political parties may benefit from a solid position among voters but not be able to conduct the economic reforms most effective for the country. According to standard portfolio theory, increased risk should be compensated with higher returns. Nevertheless, several studies (Diamonte, Liew, & Stevens, 1996; Perotti & Van Oijen, 2001; Lehkonen & Heimonen, 2015; Gala, Pagliardi & Zenios, 2018) find that political risk is violating this classic risk-return relationship, leading to the so called political risk sign paradox, as countries that are considered to be politically more at risk have been

shown to receive lower returns than politically safer countries. Pagliardi, Gala, & Zenios (2018) findings on developed markets, suggest that positive predictability of cash-flows provide a plausible economic channel driving the empirical evidence on the political sign paradox. As Gala, Pagliardi and Zenios (2018) find that an increase in political stability generally predicts positive equity returns, one could assume that, all else equal, their findings mean that rational investors who observe increased political stability in the recipient country should allocate more towards that country's equity market. Hence, one could argue that our findings of a negative relationship between active allocation to fixed income and political stability, is due to investors seeking higher stock-returns and therefore investing less in fixed income as political stability rises.

Our results show that as recipient country's confidence in economic policy rises, so does active investments to that country. On the one hand the result is unexpected, given the knowledge that interest rates tend to rise when the economy outlook is more positive, which would lead to lower bond prices and lower returns for investors. On the other hand, as Burger and Warnock (2007) find, countries with stable macroeconomic policies have more developed local bond markets which attract foreign investors. They argue that if macroeconomic instability is owed to domestic policies, an improvement in policies can lead to desirable return characteristics which attract foreign investors. Furthermore, Kaminsky and Schmukler (1999) find that changes in outlook affect financial markets in emerging economies, with average yield spreads increasing 2%, in response to a domestic downgrade. Widening yield spreads indicate a slowing economy, hence the risk of default related to the bonds rises[5]. Investors would look for a higher interest rate to compensate for this risk. Similarly, credit risk falls when the economy outlook is elevated, and yield spreads are decreasing. As lower yields lead to higher bond prices, investors who anticipate growth in an economy might flock to this country, to gain on the rising bond prices.

Gala, Pagliardi & Zenios (2018) note that politics and policy are often confounded, and while the lack of distinction does not pose methodological problems in previous research, they emphasize the importance of distinguishing

[5] Although, it is worth noting that government bonds are nearly risk-free and the default risk is perceived to be very small. As our dependent variable is constructed using return proxies using 10-year government bond yields, the coefficients and significance of PS and CEP may be invalid.

politics and policy to uncover their differential impacts on financial markets and the real economy. Our results confirm that political stability and economic policy are distinct factors that do not necessarily move in tandem and affect financial markets similarly.

5.5 Additional regressions

As our tests show multicollinearity between variables GDP and DIST, we run another regression (specification 3a) where they are added together, to remove multicollinearity. The coefficients of specification 3a (table 7) are all significant at the 1% level, except the financial crisis dummy. DEMU is now statistically significant at the 1% level, compared to being insignificant in the previous specifications. Hence, specification 3a shows that there is a negative relationship with a country's active reallocations, when both countries are in the EMU. This is surprising, given the findings of previous research. For instance, Lane (2005) mentions that due to the incompleteness of financial markets, hedging against currency risk is costly, such that there may be a preference for bonds issued in investor's home currency. In addition, Martin and Rey (2000) find that when countries share a common financial infrastructure, within group financial trade relative to other countries is raised. Since EMU improved liquidity, eliminated nominal exchange rate risk and enhanced financial integration among the member countries (see for example De Santis & Gérard, 2009) one would expect that investors' active allocation decisions would be positively correlated with EMU membership in our sample as well. However, diversification considerations incentivize the preference for assets in foreign currencies such that a negative relationship between DEMU and active investor allocations might be justified.

Table 7

Results from additional regression specifications

	Specification 3a	Specification 3b	Specification 3c
DW (t-1)	0.0251 ***	0.0199 ***	0.0162 ***
	[0.0027]	[0.0017]	[0.0017]
DB (t-1)	0.0630 ***	0.0724 ***	0.0660 ***
	[0.0120]	[0.0124]	[0.0128]
Cret	-0.0113 ***	-0.0142 ***	-0.0139 ***
	[0.0017]	[0.0011]	[0.0011]
Lret	0.0061 ***	0.0043 ***	0.0048 ***
	[0.0019]	[0.0011]	[0.0011]
GDP		-0.0038 ***	
		[0.0002]	
DIST		0.0013 ***	
		[0.0003]	
DEMU	-0.0014 ***	-0.0006 *	-0.0017 ***
	[0.0005]	[0.0003]	[0.0003]
BORD	-0.0022 ***	0.0002	-0.0023 ***
	[0.0006]	[0.0004]	[0.0003]
PS	-0.0006 ***	-0.0003 ***	-0.0003 ***
	[0.0001]	[0.0000]	[0.0001]
CEP	0.0000 ***	0.0000 ***	0.0000 ***
	[0.0000]	[0.0000]	[0.0000]
FinC	0.0011 *	0.0004	0.0003
	[0.0006]	[0.0003]	[0.0003]
GDP_DIST	-0.0029 ***		-0.0018 ***
	[0.0003]		[0.0001]
Observations	5700	5518	5518
Countries	20	20	20
Adjusted R-squared	0.0385	0.0939	0.0669

Notes: Estimated coefficient results presented. Standard errors are in brackets.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Regression results, where $\Delta w_{ic,t}^{Active}$ is the active change in portfolio weights and the dependent variable, $DW_{ic,t-1}$ is the degree of underweight in the preceding year, $DB_{ic,t-1}$ is the measure of diversification benefits, $DEMU_{ic}$ is the EMU dummy. $PS_{i,t}$ represents political stability and $CEP_{i,t}$ represents confidence in economic policy of country i, $FinC_t$ is the financial crisis dummy. $Cret_{c,t}$ and $Lret_{c,t}$ are current and lagged returns, GDP_DIST is the log of GDP for country c added to $DIST_{ic}$, the log distance between capital cities and $BORD_{ic}$ is the border dummy.

For reasons, such as that of Greece facing a sovereign debt crisis in the aftermath of the financial crisis of 2008, we expect outliers in our data, specifically caused by return data. As this data was constructed from yields of 10-year government bonds, with no available information regarding coupon rates, the data may be distorted[6]. To check if we have influential points that affect the regression line, we run a Cook's Distance test in Matlab[7], and remove 182 observations that were regarded as influential points in our dataset. Regression specification 3b is identical to specification 2b without outliers, and 3c is 3a without outliers (Table 7). We can see that adjusted R-squared of regression 2b nearly doubles when influential points are taken out, however, it still remains quite low. As it is not obvious whether the outliers are due to incorrectly measured data, we should not drop them, as they can be legitimate observations.

5.6 Limitations and further research

There are limitations to our study which lead to questions regarding the reliability and validity of our results. For instance, the bond market return indices data inaccessibility poses questions regarding the correct measurement of realized return. Ideally, we would use bond indices that cover all types of bonds with all maturities, which would capture more heterogeneity in returns. Accurate estimates of the covariance matrix of returns are critical for a good estimate of the expected portfolio risk and diversification benefits associated with different assets (De Santis & Gérard, 2006). Additionally, our country sample should have been larger, and included more heterogeneous markets in terms of political stability and confidence in economic policy, and a wider balance between emerging and developed markets. As seen in section 4.3 (Table 2) developed markets score higher on both political stability and confidence in economic policy on average, and it would be interesting to do a similar study including more emerging markets, as our study contains only one emerging market, Hungary. Milesi-Ferretti and Tile (2011) show that developed economies were hit by a harder retrenchment in capital flows than

[6] For more specific information regarding the data sources and how they were used to calculate the variables in the regression, see Appendix 3.

[7] Cook's distance is the scaled change in fitted values, which is useful for identifying outliers in the observations for predictor variables. Cook's distance shows the influence of each observation on the fitted response values. An observation with Cook's distance larger than three times the mean Cook's distance might be an outlier. Source: https://www.mathworks.com/help/stats/cooks-distance.html

emerging economies following the financial crisis. Thus, our results may not tell the whole story of the overall flight home effect as well as the overall international capital allocation following the crisis.

6. Conclusion

This master thesis makes use of IMF's Coordinated Portfolio Investment Survey to examine the level of cross-border fixed income portfolio holdings for 20 selected countries, in the period between 2001 and 2016, and how they have changed during the financial crisis. Further, this paper makes use of Ifo World Economic Survey to empirically investigate the impact of political stability and confidence in economic policy on cross-border fixed income portfolio reallocation.

Firstly, we look at the overall presence and level of home bias in the selected countries. We find that foreign fixed income portfolio diversification has increased over our sample period, as average home bias decreased by 14%. Most countries exhibited a decline in home bias, while five countries exhibited an increase. Secondly, we look closer at the level of home bias in the period 2007-2010, and find that average home bias increased during this time, indicating a presence of flight home effect.

Lastly, we look at traditional drivers of investors' active portfolio allocations and the impact of political stability and confidence in economic policy on cross-border fixed income portfolio allocation. In our main regression specifications, we find that the strongest drivers of cross-border fixed income allocation are rational portfolio optimization factors, such as the degree of underweight and diversification benefits. This result indicates that investors reallocate their portfolios to close the distance between actual weights and optimal weights according to the ICAPM. Moreover, we find that lagged returns have a positive relationship with active investment decision allocations, indicating that investors engage in positive feedback trading in the markets.

Further, we find a significant negative relationship between cross-border fixed income portfolio holdings and political stability and a significant positive relationship between confidence in economic policy and foreign fixed income holdings. The latter result indicates that political stability and economic policy are distinct factors that do not necessarily move in tandem and affect financial markets similarly.

There are limitations to our study which leads to questions regarding the reliability of our results. Incomplete or inaccessible data sources were the primary challenge, which may have led to inconsistent results. Our suggestion for further research is to perform a similar study with more comprehensive data, including more emerging markets.

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Appendices

1. Correlation matrix for variables used in regressions

	Wactive	DW (t-1)	DB (t-1)	Cret	Lret	GDP	DIST	DEMU	BORD	PS	CEP	FinC
Wactive	1											
DW (t-1)	0,0838	1										
DB (t-1)	0,05953	-0,1078	1									
Cret	-0,0846	-0,0018	-0,0938	1								
Lret	0,03403	-0,0057	-0,4286	-0,1116	1							
GDP	-0,1314	0,33419	-0,079	-0,0733	-0,077	1						
DIST	0,03944	0,30288	-0,0529	-0,0116	-0,0068	0,1474	1					
DEMU	-0,0389	-0,2467	0,04137	0,00735	0,004	-0,055	-0,40319	1				
BORD	-0,0444	-0,2606	0,00739	-0,0033	-0,0076	0,06107	-0,58347	0,19874	1			
PS	-0,0127	0,0429	0,102	-0,1216	-0,0898	-0,0157	-0,00827	-0,05077	0,041103	1		
CEP	0,02802	-0,0024	0,09938	0,01996	-0,0714	-0,1163	-0,03322	-0,11959	0,04395	0,58037	1	
FinC	0,02317	-0,0015	-0,0021	-0,0117	0,01331	0,03565	1,5E-17	3,5E-16	-1,4E-16	0,01011	0,05531	1

Where $\Delta w_{ic,t}^{Active}$ is the active change in portfolio weights, $DW_{ic,t-1}$ is the degree of underweight in the preceding year, $DB_{ic,t-1}$ is the measure of diversification benefits, $DEMU_{ic}$ is the EMU dummy. $PS_{i,t}$ represents political stability and $CEP_{i,t}$ represents confidence in economic policy of country *i*, $FinC_t$ is the financial crisis dummy. $\text{Cret}_{c,t}$ and $\text{Lret}_{c,t}$ are current and lagged returns, $GDP_{c,t}$ is the log of GDP for country c, $DIST_{ic}$ is the log distance between capital cities and $BORD_{ic}$ is the border dummy.

2. Belsley collinearity diagnostics

Belsley collinearity diagnostics assess the strength and sources of collinearity among variables in a multiple linear regression model. To assess collinearity, the software computes singular values of the scaled variable matrix, and then converts them to condition indices. The conditional indices identify the number and strength of any near dependencies between variables in the variable matrix. The software decomposes the variance of the ordinary least squares estimates of the regression coefficients in terms of the singular values to identify variables involved in each near dependency, and the extent to which the dependencies degrade the regression. The first test displays a condition index larger than the default tolerance, 30.[8] Hence, there appears to be multicollinearity between GDP and DIST, as shown in figure 4 and table 8. After adding the variables that exhibit multicollinearity together, the test shows acceptable values of variance decomposition factors (table9).

[8] Source: Matworks - https://se.mathworks.com/help/econ/collintest.html#bucjrw5

Figure 4

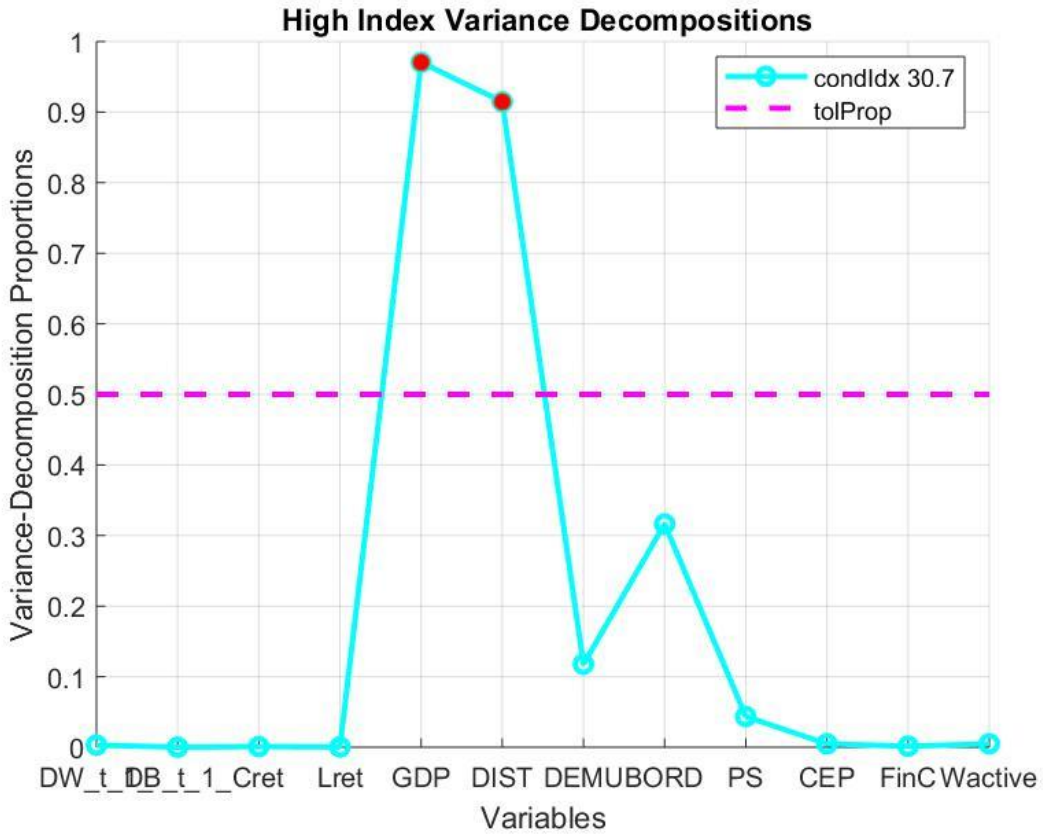

Table 8

Variance Decomposition

sValue	condIdx	DW_t_1_	DB_t_1_	Cret	Lret	GDP	DIST	DEMU	BORD	PS	CEP	FinC	Wactive
2.2092	1	0.0007	0.0046	0.0078	0.0070	0.0003	0.0004	0.0076	0.0044	0.0013	0.0063	0.0069	0.0013
1.1681	1.8912	0.2469	0.0761	0.0001	0.0357	0.0000	0.0000	0.0632	0.0765	0.0000	0.0000	0.0002	0.0232
1.0745	2.0559	0.0758	0.2241	0.0059	0.1672	0.0001	0.0002	0.0083	0.0165	0.0006	0.0080	0.0199	0.0392
1.0056	2.1968	0.0132	0.0030	0.1400	0.0371	0.0000	0.0000	0.0097	0.0131	0.0000	0.0002	0.0378	0.6108
0.9163	2.4111	0.0079	0.0003	0.0762	0.0018	0.0000	0.0000	0.0091	0.0107	0.0001	0.0005	0.7547	0.1479
0.8804	2.5094	0.0416	0.0464	0.5766	0.0103	0.0001	0.0002	0.0001	0.0003	0.0010	0.0044	0.1456	0.1492
0.8175	2.7024	0.1239	0.0170	0.0006	0.0241	0.0000	0.0002	0.1769	0.5053	0.0001	0.0002	0.0094	0.0005
0.7928	2.7865	0.3896	0.0099	0.0014	0.0253	0.0001	0.0002	0.5236	0.0109	0.0007	0.0266	0.0201	0.0018
0.6533	3.3815	0.0748	0.6104	0.1548	0.6705	0.0001	0.0002	0.0007	0.0203	0.0008	0.0085	0.0015	0.0155
0.4691	4.7092	0.0227	0.0072	0.0041	0.0169	0.0054	0.0085	0.0715	0.0040	0.0020	0.6046	0.0003	0.0043
0.1593	13.8690	0.0000	0.0010	0.0317	0.0039	0.0234	0.0755	0.0117	0.0216	0.9499	0.3360	0.0022	0.0013
0.0721	30.6519	0.0031	0.0000	0.0008	0.0003	0.9704	0.9146	0.1177	0.3164	0.0435	0.0048	0.0015	0.0049

>>

Table 9

Variance Decomposition

sValue	condIdx	DW_t_1_	DB_t_1_	Cret	Lret	DEMU	BORD	PS	CEP	FinC	GDP_DIST	Wactive
1.9990	1	0.0007	0.0077	0.0122	0.0111	0.0137	0.0112	0.0019	0.0093	0.0109	0.0025	0.0023
1.1658	1.7147	0.2420	0.0910	0.0000	0.0445	0.0658	0.1041	0.0000	0.0000	0.0004	0.0000	0.0207
1.0641	1.8786	0.1027	0.1999	0.0122	0.1537	0.0085	0.0225	0.0009	0.0109	0.0358	0.0008	0.0434
1.0056	1.9878	0.0138	0.0029	0.1407	0.0376	0.0110	0.0196	0.0000	0.0001	0.0372	0.0000	0.6124
0.9152	2.1842	0.0107	0.0007	0.1090	0.0030	0.0110	0.0190	0.0001	0.0007	0.6940	0.0002	0.1694
0.8747	2.2853	0.0894	0.0471	0.5260	0.0068	0.0011	0.0089	0.0014	0.0073	0.1655	0.0009	0.1300
0.8136	2.4569	0.0353	0.0190	0.0002	0.0190	0.3526	0.6848	0.0001	0.0003	0.0101	0.0003	0.0000
0.7864	2.5418	0.3962	0.0268	0.0003	0.0459	0.4318	0.0872	0.0015	0.0398	0.0374	0.0010	0.0008
0.6512	3.0696	0.0768	0.5985	0.1556	0.6484	0.0009	0.0403	0.0012	0.0177	0.0026	0.0006	0.0148
0.4180	4.7818	0.0315	0.0050	0.0063	0.0233	0.1032	0.0002	0.0192	0.6443	0.0020	0.0788	0.0060
0.1400	14.2828	0.0009	0.0015	0.0375	0.0067	0.0004	0.0023	0.9737	0.2694	0.0040	0.9150	0.0003

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3. Data sources and calculation of variables

Variables	Source	Calculation and comments
Date		2001-2018 used for descriptive statistics
Countries		Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Italy, Japan, Nertherlands, Norway, Portugal, Spain, Sweden, United Kingdom, United States
GDP	The World Bank	Annual data 2002-2016
Market Capitalization	Bank for International Settlements (BIS)	BIS total debt securities was not comprehensive enough source for the intended sample of countries. Several countries did not have complete data for our sample period, and were dropped from the analysis. For instance, Phillipines did not participate until 2015, Ireland until 2009, Peru until 2006 and several other markets joined after 2001. The remaining countries used had comprehensive data provided by BIS for the period 2001-2016.
Bond market returns	Global Financial Data (GFD)	We encountered problems regarding finding bond market returns. Ideally, we would use bond market indices for the countries in sample provided by for example Bloomberg or Thomson Reuters. Unfortunately we did not have access to that data through our academic institution. GFD provided us with monthly 10-year government bond market yields for selected markets, for the sample period. Realized monthly return was calculated as a percentage change rate, by using bond pricing formula. As there were no information regarding coupon rates or coupon payment date, critical assumptions were made; that the yield for a current month was the coupon rate on a bond bought that month, and that there were monthly coupon payments. These assumptions may have distorted our results. The cumulative annual return, and variance-covariance matrix were calculated using these monthly returns. Portofolio returns for country i were calculated using the actual weights invested in country c by country i and country c's annual returns.
Wactive	Coordinated Portfolio Investment Survey (CPIS)	Active change in portfolio weights were calculated using International Monetary Fund's CPIS and bond market return data.
DW (t-1)	CPIS and BIS	The difference between the optimal weights and the actual weights. Optimal weights are the weights based on on the debt market capitalization of country i over the total capitalization of the 20 countries in sample. Actual weights are the fixed income investments made by country i to country c out of its total foreign investments.
DB (t-1)	CPIS and GFD	Diversification benefit og adding asset c to country i's portfolio. It was calculated using the covariance matrix for bond market returns.
Cret	GFD	Current annual returns for countries in sample.
Lret	GFD	Lagged annual returns for countries in sample (first difference).
DIST	Simple Maps (https://simplemaps.com/data/world-cities)	The logarithm of distance between capital cities. The longitude and latitude data for capital cities were used to calculate distance by using the haversine formula in Excel.
DEMU	Europian Central Bank	Dummy for membership in the Europian Union (1 if both countries are members, 0 otherwise). No change in sample countries during sample period.
BORD	World Atlas (https://www.worldatlas.com/)	Dummy for bordering countries (1 if country i and c share a border, 0 otherwise)

FinC		Dummy for the financial crisis (1 for t=2008/2009, 0 otherwise)
PS	Ifo World Economic Survey	Political stability. The statistics used in our analysis are based on answers to the following question: "Assess the importance of the following factors which influence the climate for foreign investors in the country: political instability is absent, low or high.", where "absent" receives the value 9, "low" receives 5, and "high" receives 1. Ifo Institute changed the question format from 2016 onwards. WES reports the expert's average to each question. We use the first quarter data, which comes out mid-February, for the sample period.
CEP	Ifo World Economic Survey	Confidence in economic policy. The statistics used in our analysis are based on answers to the following question: "Assess the importance of the following problems the economy of your country is facing at present: Lack of confidence in the government's economic policy." The experts assign values in the range 100 to 0, with 100 denoting total lack of confidence. WES reports the expert's average to each question. We use the first quarter data, which comes out mid-February, for the sample period. Following Pagliardi, Gala, and Zenios (2018) we linearly transform the policy ratings to denote by 0 the lowest confidence and 100 the highest confidence in order to ease interpretation, and consistency between the two variables.

4. Summary statistics of variables

Variable	Std. Dev.	Mean	Min	Max	Observations
Wactive	0,0163	-0,0023	-0,2217	0,2904	5700
DW (t-1)	0,0858	0,0123	-0,4961	0,4763	5700
DB (t-1)	0,0199	-0,0061	-0,8808	0,0370	5700
Cret	0,1256	0,0596	-0,3783	1,5792	5700
Lret	0,1255	0,0593	-0,3783	1,5792	5700
GDP	0,5442	11,8985	10,8307	13,2720	5700
DIST	0,4935	3,4613	2,1421	4,2566	5700
DEMU	0,4252	0,2368	0,0000	1,0000	5700
BORD	0,3492	0,1421	0,0000	1,0000	5700
PS	1,5327	6,5730	1,0000	9,0000	5700
CEP	28,5274	40,8873	0,0000	100,0000	5700
FinC	0,3400	0,1333	0,0000	1,0000	5700