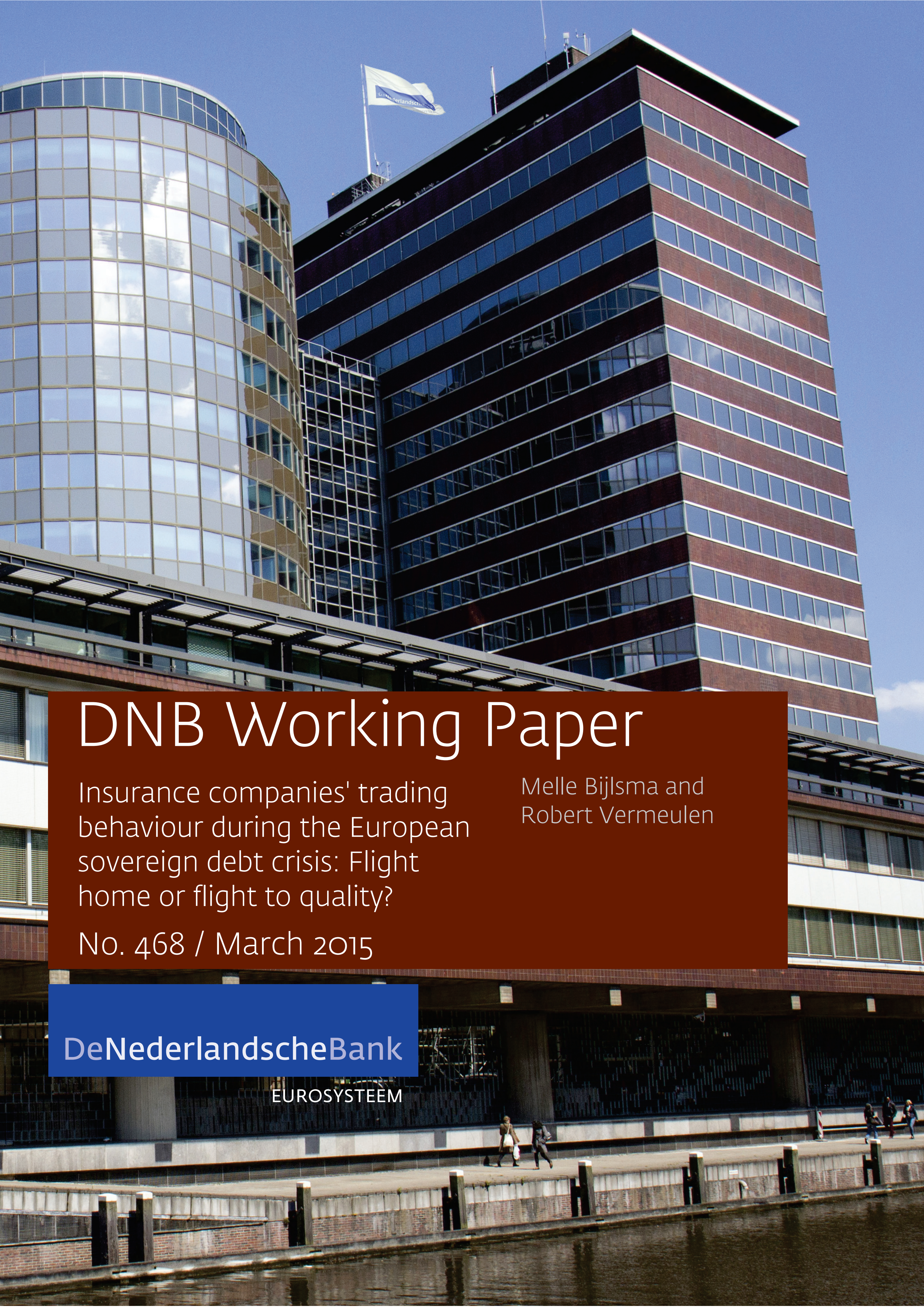

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* Views expressed are those of the authors and do not necessarily reflect official positions of De Nederlandsche Bank.

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Insurance companies' trading behaviour during the European sovereign debt crisis: Flight home or flight to quality?*

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Abstract

This paper empirically investigates if insurers exhibited a flight home or flight to quality during the European sovereign debt crisis and other stages of the financial crisis. Our dataset consists of over sixty insurance companies, for which we separately observe trading behaviour and portfolio revaluations at a quarterly frequency during 2006-2013. When explaining insurers' trading behaviour we explicitly control for country risk and momentum strategies. The results show that insurers exhibited a flight to quality during the European sovereign debt crisis, while we find no evidence of a flight home. The observed flight to quality was not present before the European sovereign debt crisis and disappeared after ECB chairman Draghi's speech mid-2012.

Keywords: international portfolio choice, insurance companies, sovereign debt crisis, flight to quality, flight home.
JEL Classification: G11, G22.

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1 Introduction

After the outbreak of the subprime crisis and especially after the bankruptcy of Lehman Brothers global capital flows collapsed, as investors shifted their portfolios towards domestic assets by actively reducing exposure to foreign markets (see e.g. Milesi-Feretti and Tille, 2011; Forbes and Warnock, 2012). The international behaviour of banks and mutual funds during this period has been well documented. For instance, Giannetti and Laeven (2012) find that banks exhibited a flight home during the crisis, pulling out of foreign assets following a shock to their financial position. Hildebrand et al. (2012) find similar results using a granular dataset on securities traded by German banks after the collapse of Lehman Brothers. Using data on cross border lending both Cetorelli and Goldberg (2011) and De Haas and Van Horen (2013) report a large reduction in cross border lending after the start of the financial crisis.[1] With respect to mutual funds, Raddatz and Schmukler (2012) find that mutual funds generated large procyclical asset reallocations during the global financial crisis, reducing their exposure to countries during bad times and increasing it when conditions improve. Both Raddatz and Schmukler (2012) and Jotikasthira et al. (2012) find that mutual funds transmit shocks across borders when facing withdrawals by investors.[2] In contrast, very little is known about the trading behaviour of insurance firms during the recent crisis.

This paper contributes to the above literature by providing the first systematic analysis on how insurance firms change their international asset allocations during periods of extreme financial turmoil. Thorough knowledge about the investment behaviour of insurance firms during periods of financial stress is necessary because they are among the largest global investors. Collectively, insurers manage US$ 20 trillion of assets around the globe, or one-third of all investments by institutional investors (IMF, 2011). Given this large asset portfolio, insurance companies' trading behaviour has the potential to exert a significant influence on market prices and international capital flows. During normal times, this influence seems to be a stabilizing one. By selling past winners and buying past losers, insurers help to stabilize market prices and capital flows. Indeed, several studies find evidence that insurers

[1] Further evidence is provided by Albertazzi and Bottero (2014) who show that foreign banks in Italy reduced lending more than domestic banks after the collapse of Lehman Brothers. For a sample of fourteen Central and East European countries Popov and Udell (2012) find suggestive evidence that foreign banks are more likely to lend less to customers compared to domestic banks after a shock to bank capital. Rose and Wieladek (2014) investigate the effect of nationalization on foreign lending and find that foreign banks in the UK reduce lending to UK residents significantly after nationalization, while this discrimination between domestic and foreign lending is not found for UK banks.

[2] For further evidence on how mutual funds transmit shocks across borders we refer to Broner et al. (2006), who show that mutual funds reduce investments in countries where they are relatively overinvested when the fund's returns are bad.

act as *contrarian* investors, which sell assets when they rise in value and buy assets when they fall in value. For instance, Grinblatt and Keloharju (2000) provide evidence from Finland's stock market showing that insurance companies and financial institutions are contrarian in the short run and neutral in the long run. Based on data for the Netherlands De Haan and Kakes (2010) confirm that insurance companies are contrarian traders during the 1999-2005 period. Similarly, Ferreira and Matos (2008) also provide evidence that insurance companies trade contrarian based on a study of institutional equity holdings across a large set of countries. However, none of these studies cover the exceptional recent events of the global financial crisis and the subsequent European sovereign debt crisis.

Given the potential for insurers to influence the stability of capital markets, it is not surprising that researchers as well as policymakers take an active interest in their behaviour during episodes of financial turmoil. A recent discussion paper by the Bank of England and Procyclicality Working Group (2014) poses the question whether insurers' investment behaviour mitigates or exacerbates market movements during such episodes. It highlights how procyclical investment decisions can exacerbate market movements and decrease the resilience of the financial system, thereby potentially contributing to serious interruptions in the vital functions that the financial system performs for the real economy. The potential for insurers to transmit such shocks may have increased during the past decade as the financial system has grown more interconnected. Billio et al. (2012) for example find evidence for this increase in interconnectedness between actors in the financial system - banks, insurance companies, hedge funds and broker-dealers - using several econometric metrics based on principal components analysis and Granger causality.

The important role of insurers in the financial system is further underlined by the recent recognition by policymakers that they can be systemically important.[3] Recently the International Association of Insurance Supervisors finalized its assessment methodology and policy framework for Global Systemically Important Insurers or G-SIIs (IAIS, 2013). The Financial Stability Board subsequently published a list of nine identified G-SIIs (Financial Stability Board, 2014), which will be subject to measures to enhance supervision, promote effective resolution and achieve higher loss absorbtion capability. Banks and insurers are as of now the only two sectors in the financial system for which such policies exist at the global level. Although a comparison of assessment methodologies implies that large insurers would in general still rank behind large banks in terms of systemic importance (Engle

[3]See Eling and Pankoke (2014) for an overview of the recent literature on systemic risk in the insurance sector.

et al., 2015), research by Dungey et al. (2013) suggests that the systemic importance of insurers may be increasing further.

Assessing the potential *consequences* of procyclical trading however remains a theoretical exercise until one actually establishes that insurers engage in such behaviour, and the evidence on this is still scarce and inconclusive. Bank of England and Procyclicality Working Group (2014) find some tentative evidence of procyclical investment behaviour by insurance companies following the Dotcom crisis in the early 2000s and the recent financial crisis, but runs into data limitations when attempting to confirm anecdotal information on the matter. A recent study by Manconi et al. (2012) on the US corporate bond market on the other hand documents that insurance companies exerted little selling pressure on the corporate bond market during the recent financial crisis.

To the best of our knowledge we are the first paper to provide a comprehensive analysis on the international asset allocation and trading behaviour of insurance companies during the recent global financial crisis. We use a confidential micro database from De Nederlandsche Bank (the Dutch Central Bank) that contains detailed information on the allocation of Dutch insurance companies' tradeable assets, disaggregated by country and counterparty sector. The data furthermore provides a specification of how the allocation evolves between periods, separating out the effects of trading behaviour (buying and selling) on the one hand and revaluation effects on the other. We match this data with supervisory information on individual insurance companies to investigate the role of insurer specific characteristics. The data contains over sixty insurance companies and covers the period from 2006Q1 up to 2013Q4.

The Netherlands presents an interesting case for the analysis of insurers' investment behaviour during the crisis. First, it has a large insurance sector with total assets amounting to 69% of GDP. Second, the sector's assets are diversified internationally, with over two-thirds of tradeable assets invested outside the Netherlands per end-2013. Third, Dutch insurance companies have flexibility in their asset allocation decisions. Dutch prudential regulation takes a principle-based approach in its assessment of investments, on the basis of the prudent person principle. Dutch insurers' investment choices are therefore less likely to be constrained by rule-based regulatory restrictions than in other jurisdictions. They also provide tentative clues to the future investment behaviour of the European insurance sector, as the future Solvency II rules for European insurance supervision take a similar principle-based approach towards investments.

We empirically analyse insurance company i's trading in country c assets during quarter t using a similar framework as Raddatz and Schmukler (2012). In this estimation framework we explicitly account for cash in- and outflows of the insurer, momentum trading strategies and country risk. The model includes regional dummies which are equal to one when country c belongs to one of the regions: The Netherlands, North Europe, South Europe and Rest of the World. By distinguishing five crisis phases, pre-crisis, subprime crisis, post-Lehman period, sovereign debt crisis and post-Draghi speech period, we investigate how insurance companies' trading behaviour changes conditional on the control variables.

The main finding of this paper is that insurance companies engaged in procyclical investment behaviour during the height of the European sovereign debt crisis through the sale of southern European assets. These results are obtained after correcting for country risk and momentum trading strategies, and are robust in several alternative specifications. The main driver behind this effect is a substantial allocation change within the portfolio of government bonds. The proceeds were invested in northern European assets in general rather than Dutch assets in particular, and the home bias of Dutch insurers did not increase during the observed period. Therefore we conclude that Dutch insurers fled to quality during this particular crisis period. This behaviour is roughly similar to what the literature finds for mutual funds (Raddatz and Schmukler, 2012), but contrasts with the flight home typically found for banks (e.g. Giannetti and Laeven, 2012).[4] We find no similar flight to quality in the periods leading up to the European sovereign debt crisis, and the effect disappears after ECB chairman Draghi's mid-2012 speech.

This paper therefore provides important information to regulators and market participants on how insurance companies - which are among the largest investors in the financial system - behave during periods of financial turmoil. These findings should be interpreted in the perspective of the European debt crisis, which was severe and took a unique form. Even though it is difficult to generalize the result to insurance companies from other countries and other crises, this paper does provide important insights on insurance companies maintaining a strong and stable international presence in periods of severe financial stress. Despite increasing correlations between international markets during periods of financial stress, international diversification still offers large diversification benefits for risk averse investors during these stress periods (see e.g. Vermeulen, 2013, for the benefits of international equity

[4]When comparing results to mutual funds we focus on the asset allocation decisions of the fund manager, not injections in or out of a mutual fund by investors.

diversification during the financial crisis). However, it is important to mention that a flight to quality may change asset allocations significantly *between* countries during such periods.

For policymakers, these findings show that insurance companies can generally be considered to be stable investors, but not by definition. They also point towards the relevance of a stable supply of more or less risk-free assets, given its importance to the insurance sector, and the difficulty of attaining a single capital market in absence of this. Policymakers should also take note that the behaviour that we observe for insurers is different from that of banks. This means that measures taken to promote the stability of one sector may not always have the intended effect on the other - a differentiated approach may be required.

The paper proceeds as follows. Section 2 discusses the two phenomena that we attempt to separate out when studying Dutch insurers' investment behaviour: the flight to quality and flight home. Section 3 describes the institutional context in which Dutch insurers operate. Section 4 introduces the dataset and presents the empirical methodology and benchmark specification. Section 5 presents the benchmark results on our trading data, that are subsequently tested for robustness in Section 6. Section 7 presents the result of additional empirical tests aimed at measuring the evolution of insurers' home bias and finally, Section 8 concludes.

2 Flight home or flight to quality?

In our analysis of insurers' investment behaviour during the sample period, we investigate whether we observe two related but distinct phenomena: the *flight to quality* and the *flight home*.[5] A flight to quality occurs when insurers reduce investments considered risky and increase investments in assets considered safe in reaction to market stress. This investment response is a well documented phenomenon in credit markets, and is typically attributed to an increase in agency costs on risky loans during times of stress (Bernanke et al., 1996). Under these circumstances, the financial situation of risky borrowers deteriorates and the possibility of bankruptcy increases. This in turn leads to increased monitoring costs for credit suppliers, inducing them to shift their investments to safer assets.

In the context of the insurance sector, the flight to quality phenomenon interacts closely with the concepts *momentum* and *contrarian* trading as observed by Grinblatt et al. (1995). Whereas insurers

[5] Giannetti and Laeven (2012) have previously adopted and defined these concepts in their research on the lending behaviour of banks.

are generally found to be contrarian or neutral traders, they may turn into momentum traders during a flight to quality, selling assets that fall in value and buying assets that increase in value. For large investors that themselves influence market prices, such behaviour has a procyclical effect, further depressing the prices of losing assets and further bidding up the prices of appreciating assets.

Note that the safer assets sought after during a flight to quality can be located both in domestic and foreign markets. This distinguishes flight to quality from flight home, where market stress increases the propensity for insurers to invest in the domestic market. This response is closely related to the general preference of investors to invest close to home known as the *home bias* phenomenon. The existence of the home bias is well documented for investors in different institutional settings for equity investments (e.g. Grinblatt and Keloharju (2001), Chan et al. (2005) and Portes and Rey (2005)) and bonds (e.g Butler, 2008). It is generally explained as an outcome of information asymmetries or familiarity biases, for which the distance between investor and investment serves as a proxy. A flight home response is essentially an increase of the home bias, and as such could be explained by an increased prominence of these factors in periods of market stress. An alternative explanation is that domestic investments increase the probability to be bailed out by the government if the investor comes under duress (Giannetti and Laeven, 2012). From a portfolio diversification perspective a flight home is undesirable because diversification benefits decrease. Vermeulen (2013) shows that international diversification strongly benefits investors especially during crisis periods.

From a theoretical perspective, insurers should be less likely to engage in a flight to quality than many other institutional investors. Unlike banks or mutual funds, they are generally not sensitive to sudden withdrawals by policy holders. Put differently, from a liquidity perspective the insurer's liabilities are much stabler than the liabilities of banks and open-end mutual funds. This absence of liquidity risk should increase insurance companies' possibilities to assume a role as long-term investors, holding on to discounted assets and buying more if prices become sufficiently attractive and thus maintaining their contrarian investment role during times of market stress.[6] Furthermore, insurers' assets could be considered to be less susceptible to the increase in agency costs which forms the theoretical foundation of the flight to quality phenomenon. In contrast to banks' loan books, insurers invest a large part of their portfolio in marketable bonds that hold an external credit rating

[6] Giannetti and Kahraman (2014) compare the trading behaviour of open-end mutual funds with closed-end mutual funds. The authors find that asset managers in a closed-end mutual fund are more likely to trade against mispricing, which can be explained by these funds not being subject to redemption risk.

thus substantially diminishing agency costs. Insurers could also be less likely to engage in a flight home driven by political motives, as they are in general considered less systemically important than banks. A lower degree of systemic importance would diminish any potential motive to engage in a fight home in order to secure a government bail-out.

This does not mean that insurers are by definition immune to flights to quality or flights home, however. Although they are generally shielded from liquidity risk, insurers still face solvency risk when they hold on to risky assets in times of market stress. An increase in this risk could trigger a change in investment behavior. Related to this, there are concerns that insurers may be decreasingly able to invest in line with their long-term horizons as a result of changes in solvency regulation and valuation methods (Bank of England and Procyclicality Working Group, 2014). The investment behaviour of insurers may also be impacted through changes in liability characteristics, risk appetite and the investment philosophy of insurers themselves. Even though the marketable bonds held by insurers diminish agency costs for credit monitoring, this does not rule out the possibility of a flight to quality to occur when these bonds are downgraded. And the potential impact of a flight home or flight to quality by insurers, once triggered, is likely to be substantial. The marketable assets held by insurers could presumably be sold off in a shorter timeframe than it would take a bank to run off its loan book at reasonable prices.

3 Institutional setting

The Dutch insurance sector contains over 200 firms and manages EUR 446 Bn worth of assets by end-2013, which equates to 69% of Dutch GDP. Of these assets, EUR 200 Bn is held directly in tradeable securities - equities and bonds. The remainder consists of assets held in mutual funds and non-tradeable asset types such as strategic participations, loans and real estate. Six life insurance groups account for a large majority of assets, while the remainder is distributed over a large number of smaller insurers in the life, non-life, health care and reinsurance segments of the sector. The role of life insurers as large asset managers follows from the long-term nature of their products. By contrast, non-life and health insurers typically manage fewer assets as the cycle between premium collection and benefit payments in their business model is usually much shorter.

During the time period studied, the regulatory environment for Dutch insurers was based on the European Solvency I framework. Under this framework capital requirements are determined as a fraction of liabilities to policyholders, while no formal relation exists with the level of investment risks. De Haan and Kakes (2010) find that these solvency requirements are typically not binding and that insurers' solvency margins are related to risk characteristics. This suggests that insurers set risk-based capital targets for internal purposes, possibly in response to requests by shareholders and rating agencies or in anticipation of the impending introduction of the (risk-based) Solvency II framework.[7]

Regarding the allocation of assets, the Dutch regulatory environment is based on the *prudent person principle* rather than quantitative investment limits. Insurers are expected to ensure that their investment portfolio is in keeping with the nature of the obligations to policyholders entered into. Furthermore, the insurer must arrange for the assets to have an adequate diversification of risk and high-risk assets must be restricted to a prudent level. Investment limits are currently only stipulated in specific cases, such as for non-marketable loans and individual large exposures (DNB, 2007). The prudent person principle does not leave insurers entirely unconstrained and thus still has the potential to influence investment behaviour.[8] However its design as a principle rather than a rule does however give Dutch insurers more freedom in reacting to adverse events relative to insurers in the United States and other European countries, where regulation is to a larger degree based on investment limits.[9]

The application of the prudent person principle for Dutch insurers is also relevant as the future Solvency II rules for European insurance regulation and supervision take a similar approach towards investments. The behaviour of Dutch insurers can therefore provide tentative clues for future investment behaviour of the broader European insurance sector.

[7]Note that the risk weight of sovereign debt is zero for all EU countries in the Solvency II standard formula for calculating capital requirements.

[8]Some evidence on the influence of the prudent person principle exists for other markets and jurisdictions. For instance, Del Guercio (1996) finds that US banks subject to prudent person laws invest in more high-quality assets in the equity market, while mutual funds do not.

[9]See Davis (2002) for a survey of investment allocation rules in different OECD countries, and Koijen and Yogo (forthcoming) for evidence on how financial and regulatory frictions affect the pricing behaviour of US life insurance companies. See also Ellul et al. (2011), who find that insurance companies that are relatively more constrained by regulatory constraints are more likely to sell downgraded corporate bonds. Recently, rules in the United States focused less on credit ratings, which gave insurers more discretion in their investment behaviour (Hanley and Nikolova, 2014).

4 Data and empirical methodology

4.1 Data

The basis for our analysis is a granular set of micro data on the investment allocation of 63 of the largest Dutch insurance entities, which covers about 95% of the insurance market in terms of turnover and assets. The dataset is collected on a quarterly basis by De Nederlandsche Bank for balance-of-payment statistics purposes and is available from 2006 onwards.

For the purposes of our analysis, we select the portfolios of tradeable assets held directly by the insurer. Insurers typically bear the investment risk on this portfolio themselves and although day-to-day investment decisions are sometimes delegated to asset managers, the final responsibility for the allocation of assets lies with the insurer itself. We disregard participations in mutual funds as trading behaviour on these portfolios is more difficult to interpret. These mutual funds are typically associated with unit-linked policies managed for the risk of policyholders. Investments in such funds are often made according to policyholders' preferences and subject to automatic rules. We also disregard non-tradeable asset portfolios such as loans and real estate. The data shows that these portfolios are concentrated heavily in the Netherlands throughout our observation period. For instance, 95% of outstanding loans and 96% of participations are to Dutch counterparties at end-2013. As we analyse investment behaviour geographically, this makes the value added of these investments to our analysis rather limited. The size of these portfolios as a percentage of total assets is also stable through time, thus assuring us that substitution effects between tradeable and non-tradeable assets are not material.[10] Focusing on tradeable asset portfolios only offers us the advantage of clarity when interpreting results as characteristics - for instance liquidity - of tradeable and non-tradeable assets can differ substantially.

Our starting point is therefore a set of information on different types of tradeable assets. We distinguish five of such instrument types: equities, government bonds, bank bonds (MFI), other financial institution bonds (OFI) and non-financial corporate bonds (NFI). Our dataset contains information on investment positions per country and per instrument type for each insurer, on a quarterly basis. The data contains the size of these positions and the flows during each quarter, separated out into transactions (buying and selling), valuation changes and exchange rate effects. For

[10] We do observe changes in investment behaviour through time that suggest intra-portfolio substitution for loans, for instance a shift from short-term lending to long-term mortgage lending.

example, our dataset can tell us the value of Swedish bank bonds that a Dutch insurer held at the end of 2012. It can also tell us the value of Greek equities that insurers purchased or sold during the first quarter of 2010, separate from valuation effects on existing equity holdings that may also have occurred during this period.

We then proceed to delete investments in known financial centers from our dataset: the Cayman Islands, Jersey, Ireland and Luxembourg. This reduces the total value of assets in our sample by about eight percent and this fraction is relatively constant throughout time, i.e. we do not observe an in- or decrease in the fraction of assets allocated to financial centers during the crisis periods. Investments registered towards these countries are often not a reflection of actual investments in these countries: their country of registration may therefore not accurately reflect their risk profile.[11] Unfortunately our dataset does not allow us to 'look through' these investments to the underlying actual country of investment.

The resulting dataset covers EUR 178 bn of tradeable investments held for the risk of the insurer per end-2013, or 89% of the total for the Dutch sector. Figure 1 shows how the value of these investments increased over the period observed, due to a combination of valuation effects and cash in- and outflows. It furthermore shows the distribution of these investments over the different asset classes. Investments in equities decreased markedly during the observed period: after reaching a high of 24% in 2007, it drops and remains at levels close to 10%. This decrease is mirrored by an increase in the proportion of assets held in government bonds, which increased from 48% in 2007 to 58% in 2013. The investment shares allocated to other types of bonds are relatively stable throughout the period.

[Figure 1 about here.]

Figure 2 shows that Dutch insurance companies invest a large majority of their tradeable assets abroad. We group countries into four regions: 1) The Netherlands, 2) North European euro area countries (Austria, Belgium, Estonia, Finland, France, Germany, Slovakia), 3) South European euro area countries (Cyprus, Greece, Italy, Portugal, Slovenia and Spain) and 4) Non euro area countries. The Netherlands is the home country in this sample and we split the other euro area countries in two

[11] Excluding financial centers relates to the so called third country problem, where e.g. insurance companies hold equity in a mutual fund in country B, while this mutual fund invests its capital in country c. It is unfortunately not possible to assess the final destination of equity investments channeled through a financial center. See also Lane and Milesi-Feretti (2007) for an exposition on how this third country problem affects international investment positions.

groups based on the extent with which the crisis hit them. The country group South is hardest hit and their sovereigns all faced downgrades and reached a S&P sovereign rating below A. The countries in country group North were less severely hit and maintained a sovereign rating of A or higher.[12]

Taking a closer look at the cross country allocation Figure 2 shows that around a third of the Dutch insurers' assets included in our dataset are held in the Netherlands. While Figure 2 initially documents a decrease in this share, it has increased again since 2009. The largest share of assets is allocated to North European countries, increasing fast from 2009 onwards and reaching 43% at the end of 2013. The increase in North European assets is mirrored by a sharp decrease of assets allocated to South Europe. Since late 2008, when over 20% of assets were allocated to South European countries, the share has decreased to 4% end-2013. Finally, the investment share allocated to non euro area countries increases steadily to 22% at the end of 2013. Investments in the United States and United Kingdom constitute the largest portions of this share, followed by Australia and Sweden.

[Figure 2 about here.]

The bottom right panel of Figure 2 illustrates that the perceived riskiness of investments in South European euro area countries changed dramatically during our observed period. The graph shows the evolution of the weighted average sovereign CDS spreads for all countries in each region. Country weights are obtained by taking the average investment share within the region for all insurers combined throughout the 2006-2013 period.[13]

The graph shows that investors' risk pricing for all countries' sovereigns was low during the pre-crisis period. CDS spreads increased modestly across the board during the subprime crisis of 2007, which was concentrated in certain financial instruments rather than a particular country. More specifically, equity and RMBS markets were severely hit in July and especially August 2007 when Bear Stearns and BNP Paribas, respectively, reported problems with their funds exposed to the subprime market. This period is followed by the Lehman Brothers crisis from the fall of 2008 onwards which saw the beginning of a divergence between regions - CDS spreads in southern Europe rose markedly more than in other regions.

[12] One can argue that Germany is a safe haven within the country group North and thereby a "safer" investment risk than the Netherlands. The empirical results below and the conclusions drawn from these results are not sensitive to separating out Germany from the country group North. Detailed results are available upon request.

[13] To illustrate, suppose that countries x and y make up region R, and average investment shares for x, y and R are 7%, 3% and 10% respectively. The weighted CDS spread is then 0.7*CDS(x) + 0.3*CDS(y). Changing the observed period from which the average investment shares are drawn does not materially alter the relative results between regions.

The increase in CDS spreads after the collapse of Lehman Brothers is still modest in relation to the sharp rise in southern European CDS spreads witnessed during the subsequent European debt crisis, which started in the fall of 2009. Late 2009 Greece's new government announced that the 2009 budget deficit would be 12% instead of the forecasted 6%. After the collapse of Dubai World investors became increasingly worried about Greek debt as well. Furthermore, rating agencies downgraded Greek bank and sovereign debt. Therefore we date 2009Q4 as the start of the European sovereign debt crisis.

The trend of ever increasing CDS spread for South European sovereigns eventually reversed after the well-known July 2012 speech by chairman Draghi that the ECB would do 'whatever it takes' to preserve the Euro, but only gradually and a large divergence with the spreads of other regions persisted until the end of 2013. A similar picture is obtained by an analysis of sovereign credit ratings, albeit with a time lag compared to CDS spreads. These spreads and ratings are primarily a measure of the riskiness of sovereign bonds, but the results also extend to the other asset classes. Risks for sovereigns and national banking sectors are positively correlated due to the existence of sovereign-bank spillover effects (see e.g. De Bruyckere et al. (2013) and Avino and Cotter (2014)). More generally, country risk is an important factor for investors and rating agencies when determining the riskiness of bonds or equities.

We proceed to link a set of insurer-specific variables to the investment data, which we obtain from DNB's supervisory information dataset. For each insurer, we link total assets, received premiums, net profit and the solvency position based on the Solvency I framework. Table 1 contains summary statistics for each of these variables. This data on individual insurers is confidential at the quarterly frequency. Hence, we only report the mean, median and standard deviation for each variable during the full sample period.

[Table 1 about here.]

Table 1 shows that the median insurer size is close to EUR 2 bn. However, the mean size is around EUR 7.3 billion, which reflects the structure of the Dutch insurance market with quite a number of small insurers and small group of very large insurers. The median insurer in the sample has a solvency ratio of 276%, indicating that capitalization is nearly triple the mandatory amount. This suggests that capital requirements under the Solvency I framework are generally not binding for Dutch insurers, a finding in line with the outcome of other research (cf. De Haan and Kakes, 2010). The average solvency ratio remained relatively constant and did not exhibit very large drops during the 2006-2013 period.

4.2 Empirical methodology

In order to empirically investigate the investment behaviour of insurance companies and how this changed during different phases of the crisis, we follow a similar empirical strategy as Raddatz and Schmukler (2012) who investigate the country allocation decisions of equity and bond mutual funds. Relative to their paper, our dataset offers the important advantage that we observe the trading behaviour of insurers directly. This takes away the need to impute trading behaviour from the combination of changes in the valuation of asset portfolios and market return indices.[14] We also directly observe the revaluation effects on each element in the insurer portfolio directly, allowing us to calculate specific asset returns directly from observations in the data. We can thus base our analysis on more granular data with fewer underlying assumptions.

For the purposes of our analysis, we distinguish five time periods in our dataset. These are respectively the pre-crisis period (2006Q1 - 2007Q2), the subprime crisis (2007Q3 - 2008Q2), the Lehman Brothers crisis (2008Q3 - 2009Q3), the European sovereign debt crisis (2009Q4 - 2012Q2) and the 'post-Draghi' period (2012Q3 - 2013Q4) following the ECB chairman's speech that the ECB would do 'whatever it takes' to preserve the Euro. These periods are of interest as they each represent a different level and type of market stress and could therefore each have triggered a unique change in investment behaviour across countries (see Figure 2 and Section 4.1).

The literature shows that momentum and asset riskiness are important in explaining insurance companies' trading behaviour (see e.g. Ferreira and Matos (2008) and De Haan and Kakes (2011) on momentum trading and Ellul et al. (2011) on trading when asset riskiness changes.). Therefore, in the empirical model we allow trading to depend on lagged returns to capture momentum and lagged CDS spreads to capture country risk. In addition, we allow the coefficients on these variables to change during different crisis phases. Put differently, we allow insurance companies to change their momentum strategy and risk appetite during different phases of the crisis. Our identification of flight to quality and flight home will therefore be conditional on momentum trading and risk preferences.

[14] Raddatz and Schmukler (2012) follow the methodology of Curcuru et al. (2011) by calculating an implicit return on assets to distinguish between active and passive rebalancing of portfolios. This methodology is used when directly observed trading data is not available, e.g. when studying international portfolios based on the IMF's Coordinated Investment Survey (Vermeulen, 2013).

Hence, a flight to quality and flight home are therefore effects beyond fundamental factors.

In the empirical estimation let us define insurance company i's trading in country c assets as 1 + the insurer's net buys of country c assets as a fraction of the begin of period allocation to country c ($T_{i,c,t}$). So, if insurer i's allocation to country c is EUR 20 at the beginning of period t and this insurer sells EUR 5 during period t, $T_{i,c,t} = 0.75$. So, $T_{i,c,t}$ captures the change in insurer i's allocation to country c driven by insurer i's buying and selling decisions, i.e. excluding valuation effects.

Next, $T_{i,t}$ captures the net flows in or out of insurer i during quarter t, measured as the raw increase or decrease as a fraction of the begin of period assets. Put differently, if insurer i's total assets are EUR 100 at the start of time t and this insurer's net inflows during period t are EUR 5, $T_{i,t} = 1.05$. In the empirical model we model the dependent variable as the difference between $log(T_{i,c,t}) - log(T_{i,t})$. This implies that the dependent variable is zero when net cash inflows are 5% of total begin of period assets and insurer i increases his allocation to country c by 5%. Formally, we estimate the model

$$log(T_{i,c,t}) - log(T_{i,t}) = \beta * (log(R_{i,c,t-1}) - log(R_{i,t-1})) + \beta_p * I(p) * (log(R_{i,c,t-1}) - log(R_{i,t-1}))+ \\ \gamma * log(CDS_{c,t-1}) + \gamma_p * I(p) * log(CDS_{c,t-1}) + \Psi_{REG,p} * I(p) * REG_c + \mu_{i,c} + \epsilon_{i,c,t}. \tag{1}$$

where $R_{i,c,t-1}$ is the gross return on insurer i's investment in country c during period t-1 and $R_{i,t-1}$ the gross return of the entire asset portfolio, $CDS_{c,t-1}$ is the end of quarter CDS spread for country c and REG_c represents four dummy variables that are equal to one for a respective country group $REG = (NL, North, South, ROW)$. For example, $North = 1$ if country c belongs to the country group $North$. The coefficients β and γ are the normal pre-crisis coefficients. These coefficients are allowed to change during different crisis phases $p = (Subprime, PostLehman, Debtcrisis, PostDraghi)$. The indicator vector I(p) is equal to one during crisis phase p. Therefore, for each variable there are five coefficients that need to be estimated. This allows full flexibility and allows us to identify during which crisis phases coefficients change. Finally, $\mu_{i,c}$ captures insurer-country preferences that do not change in time, i.e. it extracts the mean of this variable.

In order to assess if the trading behaviour of Dutch, North and South assets is different during each crisis period p we conduct F-tests on the equality of the ψ coefficients. In particular, we test if $\psi_{NL,p} = \psi_{North,p}$, $\psi_{NL,p} = \psi_{South,p}$ and $\psi_{North,p} = \psi_{South,p}$. In case $\psi_{NL,p}$ and $\psi_{North,p}$ are significantly larger than $\psi_{South,p}$, we argue there is a flight to quality. When $\psi_{NL,p}$ is significantly larger than both $\psi_{North,p}$ and $\psi_{South,p}$ there is evidence of a flight home. We do not report the F-tests for the ROW coefficients, because the empirical analysis focuses on the within-euro area trading. However, the results for the ROW coefficients can be provided upon request.

Equation (1) is estimated using ordinary least squares with fixed effects included for insurer-country pairs. The results control for each insurer's cash in- and outflows when calculating the dependent variable by subtracting $log(T_{i,t})$ from $log(T_{i,c,t})$. Therefore, we cluster standard errors at the insurer-country pair.

5 Main results

5.1 Overall trading

We start the benchmark results by estimating Equation (1) without lagged returns and CDS spreads in the regression. This regression provides information on how insurers change their trading across regions during different phases of the crisis by only controlling for insurer*country dummies. In subsequent regressions we include either lagged returns or CDS spreads or both in the model to establish the importance of including these variables for establishing if there is a flight home or flight to quality.

Table 2 presents the first set of results on the trading behaviour of insurance companies during the crisis. Column (1) shows the estimated coefficients on the crisis phase*region variables. When analyzing the results we focus on the question if the trading behaviour of insurance companies differs between NL, North and South assets during a specific crisis phase. In order to formally establish a difference in trading we report the p-values of F-tests on coefficient equality below the regression results. The F-tests indicate a possible flight home or flight to quality during a particular crisis phase when the coefficients on crisis phase*NL and crisis phase*North are significantly larger than the coefficient on crisis phase*South. If this is the case and the crisis phase*NL coefficient is significantly larger than the crisis phase*North and crisis phase*South coefficients we find evidence for a flight home. If the coefficients on crisis phase* NL and crisis phase*North are not significantly different there is evidence in favour of a flight to quality.

[Table 2 about here.]

From column (1) we conclude that trading behaviour between the three country groups does not significantly differ during the subprime crisis. However, during the other periods there are significant differences. During the post Lehman period insurers acquire significantly more Dutch and North assets relative to South assets, i.e. the coefficient on Lehman*NL is significantly larger than the coefficient on Lehman*South and the same holds for the coefficient on Lehman*North being significantly larger than the coefficient on Lehman*South. This flight to quality remains during the sovereign debt crisis and after Draghi's 2012 speech. We find no evidence of a flight home because the coefficients on NL and North never significantly differ from each other at any point in time.

Column (2) includes lagged returns in the regression, with coefficients that are allowed to change during the different phases of the crisis. During the pre-crisis period insurers seem to follow a positive feedback momentum trading strategy. However, since the start of the subprime crisis trading is no longer related to past relative returns. In fact, the coefficient on lagged returns decreases to 0.194 - 0.165 = 0.031 during the subprime crisis. This is insignificant from zero when taking standard errors into account. During the post Lehman period and the sovereign debt crisis the coefficient is even lower. When considering the F-tests on coefficient equality we no longer find evidence of a flight to quality during the subprime crisis. However, during the sovereign debt crisis and post Draghi speech phases, there is still evidence of flight to quality, but never a flight home.

The above results regarding momentum trading during the 2006-2013 period differ from earlier research. Using data from 1999-2005 De Haan and Kakes (2011) find evidence for contrarian trading by insurance companies. The years they study also contain some periods of turmoil, for example the burst of the IT bubble at the turn of the century and an economic recession during the early 2000s. However, financial stress was quite limited compared to the most recent crisis. The results in column (2) indicate that insurers do not have a constant momentum strategy. In fact, the insurers' momentum strategies appear to be time varying.

Next, column (3) includes the CDS spread to capture insurer reactions to country risk changes. Before the crisis and during both the subprime crisis and post Lehman phase country risk is never significant. Put differently, our model does not show a relationship between trading and country risk during these periods. This changes during the sovereign debt crisis and post-Draghi phases when the coefficient becomes significantly negative. In terms of magnitude the coefficient implies that a doubling of country c's CDS spread results in selling 4% of country c assets by insurer i, ceteris paribus. Note that including CDS spreads decreases the number of observation by about a third. However, the observations we lose represent less than five percent of the total assets of the insurers in our sample. Hence, the studied sample remains representative.

Turning to the F-tests, we only find evidence for flight to quality during the sovereign debt crisis. When including CDS spreads we no longer find flight to quality during the post Draghi phase. This implies that the unconditional results in column (1) can largely be explained by country risk. Note that the coefficient on CDS spreads is slightly larger in magnitude than the coefficient on CDS spreads during the sovereign debt crisis. However, an unreported F-test shows that the coefficients are not significantly different from each other. The results also show that when including CDS spreads, it appears that insurers invested (marginally) significantly less in the Netherlands compared to South assets during the subprime crisis. This finding is not very strong, but does suggest some risk seeking behaviour during this period, which similar to Becker and Ivashina (forthcoming), who find that US insurers exhibited a search for yield during the pre-crisis period.

Column (4) includes both lagged returns and CDS spreads. The results are very similar to those in column (3). The main result is that after accounting for momentum trading and country risk, there is only evidence of flight to quality during the sovereign debt crisis. There is never an indication that insurers exhibit a flight home in their asset holdings during any phase of the crisis. Table 8 in Appendix A shows that these results are not sensitive to the in- or exclusion of insurer-country pair dummies.

In the present study we focus on intra euro area trading behaviour. However, it is also possible to draw conclusions on how insurance companies traded assets outside of the euro area. In order to do so we need to compare the coefficients on NL and ROW during the different crisis periods. Unreported F-tests show that the coefficient on NL is never significantly larger than the coefficient on ROW during any of the crisis periods. Hence, there is no evidence of a flight home from non euro denominated assets. In fact, as Figure 1 illustrates, the share of assets held in non-euro area destinations increased during the time period we study.

Finally, we turn to the economic importance of the differences in trading behaviour by discussing the magnitude of the coefficients in column (4). During the sovereign debt crisis we find the following coefficients for NL (0.211), North (0.214), South (0.033) and ROW (0.177). We established that the coefficients on debtcrisis*NL and debtcrisis*North are significantly larger than the coefficient on debtcrisis*South. The difference is 0.178 for NL and 0.181 for North. This implies that insurers acquire 18 percentage points fewer South European assets compared to NL and North assets during the sovereign debt crisis. Put differently, if insurers actively increase their Dutch and North assets by 5 percent during a quarter in the sovereign debt crisis, they simultaneously sell 13 percent of the South assets they own at the start of this quarter. Note that the coefficients of the four regions do not need to add to zero because the fraction invested in each region are not equal. In addition, these figures are conditional on momentum strategies and trading on CDS spreads.

5.2 By asset class

This section investigates if the results obtained in the previous section for total assets also hold across individual asset classes. Table 3 shows the regression results when estimating Equation (1) for individual asset classes. The setup is similar to Table 2 and we focus again on the results of the F-tests, i.e. do insurance companies discriminate between region beyond controlling for momentum and country risk in their trading behaviour. So, all results need to be interpreted conditional on momentum strategies and country risk. Moreover, because of the inclusion of insurer*country dummies the trading behaviour pre-crisis is implicitly assumed as "normal" trading behaviour.

[Table 3 about here.]

The first regression shows that insurers bought significantly more North and South equities compared to Dutch equities during the subprime crisis. This effect is partly reversed during the post Lehman phase when insurers bought significantly more Dutch than North equities. Interestingly, the results show no significant difference in the trading of North and South equities, even though research shows that South European equities were harder hit by the post-Lehman crisis (see e.g. Grammatikos and Vermeulen, 2012). There is no significant difference between the trading behaviour in Dutch and South equities during this phase. During the sovereign debt crisis we do not find any difference between the three regions. However, during the post-Draghi period we find that insurers buy significantly more Dutch equities relative to North and South equities.

In the second regression we analyse the trading in government bonds. During the subprime crisis, the results do not show a difference in government bond trading between the different regions. During the post Lehman phase and sovereign debt crisis insurers buy significantly more Dutch and

North government bonds compared to South government bonds. This effect is especially strong during the sovereign debt crisis, consistent with the benchmark results in the previous section. Recall that government bonds are also by far the largest class insurers hold. However, there is some indication that insurers prefer Dutch government bonds over North government bonds during the sovereign debt crisis. This result is only marginally significant though. In the post Draghi speech phase there is no evidence of a significant difference between the different regions anymore.

When considering MFI bonds we find different results. During the subprime crisis insurers tend to favor Dutch and South bank bonds over North bank bonds. Since post Lehman phase insurers maintain a significant preference for buying Dutch bank bonds relative to North bank bonds, while not clearly distinguishing between North and South bank bonds.

Turning to columns (4) and (5) which explain the trading in bonds of other financial institutions and non-financial institutions, respectively, we find only differences in trading behaviour. During the subprime crisis insurers significantly buy more North OFI bonds relative to South OFI bonds. However, during the same period they buy significantly more South NFC bonds relative to North NFC bonds.

Since the dependent variable ($log(T_{i,c,t}) - log(T_{i,t})$) in Equation (1) is characterized by long tails. In fact, there is significant excess kurtosis. This holds for total assets, but also across the different asset categories investigated in Table 3. In order to ensure that the benchmark results are not driven by outliers we run the regressions again by Winsorizing the values of the left and right tails of the distribution by the 1% and 99% value, respectively.[15] Table 9 in the Appendix shows the estimation results with column (1) for total assets and columns (2)-(6) for the sub-categories equity, government bonds, MFI bonds, OFI bonds and NFC bonds, respectively. The results are in line with the regression results in Tables 2 and 3.

6 Robustness checks

6.1 Incorporating target country weights

The empirical approach in Section 5 does not incorporate a target country weight that insurers strive to obtain. This is because to the best of our knowledge, there is no appropriate theoretical model available to predict optimal international asset allocations for insurance companies. Nevertheless an

[15] Winsoring tails is a common procedure in empirical finance studies to test the sensitivity of regression results to outliers (See e.g. Ellul et al., 2011; De Haas and Van Horen, 2013).

intuitive case can be made that insurers adapt their portfolio in response to changes in the supply of assets, ceteris paribus. An extreme example serves to illustrates this point. Suppose one country manages to decrease its debt by half while another country increases it substantially and country risk is considered to be unchanged. Under these circumstances, institutional investors would struggle to maintain their share of investments in the former country and would likely rebalance towards the latter. This mechanism could potentially have a bearing on the results. If for instance the availability of Dutch assets decreased relative to northern European assets this could distort our observation of a potential flight home.

To investigate whether this is the case, this section adds target country weights to our benchmark specification that are derived from the market value of each country's securities in the global securities market. This methodology follows the prediction by the Capital Asset Pricing Model (CAPM) that insurance companies allocate their assets accordingly. We recognize that insurers are likely to deviate from CAPM for a number of different reasons, e.g. distance or currency denomination (see also Section 7). Still the CAPM benchmark can be useful benchmark for predicting changes in insurers' portfolio in response to changes in market valuations or changes in the difference between the insurer's investment share in country c and country c's CAPM share. This allows us to test the robustness of the findings in our benchmark specification to the mechanism described above.

We calculate country shares as predicted by the CAPM using either a country's market value of total debt or the market value of total equity. County C's predicted optimal share is then market value of country c's outstanding debt (equity) / market value of global outstanding debt (equity). We use BIS data to calculate the debt numbers and Datastream equity market indexes data to calculate the equity numbers.

[Table 4 about here.]

Table 4 shows the results when adding four different changes in CAPM based target weights to the benchmark specification.

Column (1) considers the lagged change in the debt CAPM gap and interacts these with the different crisis phase dummies, to allow for changing investment behaviour. The coefficient on the lagged change in the debt CAPM is positive and significant. This implies that insurers acquire more country c assets when the difference between the insurer's share of country c assets and the CAPM share increases. This effect is constant throughout the 2006-2013 time period. Turning to the F-tests to assess if this effect overturns the benchmark results we come to the conclusion that the benchmark results remain intact. There is evidence of flight to quality only during the sovereign debt crisis and never a flight home.

In column (2) we include the change in the debt CAPM share together with the interactions. The coefficient is significant positive throughout the sample period and signals that insurance companies increase their holding of country c assets when the market value of country c's debt securities becomes a larger share of total world debt. So, the results in columns (1) and (2) indicate that insurance companies do actively follow the CAPM to some degree. The F-tests confirm the results of the benchmark equations.

The results in columns (3) and (4) follow the same approach as columns (1) and (2), but using the market value of equity instead of debt in a country to calculate the CAPM weights. The main result of columns (3) and (4) is in line with columns (1) and (2) and the benchmark results: We find a strong case for flight to quality during the sovereign debt crisis, but not during other phases of the crisis and insurers never exhibit a flight home. Taking a closer look at the results in columns (3) and (4) we again find positive coefficients on the changes in the CAPM target weights, albeit insignificant in column (4), and these coefficients are constant during the 2006-2013 time period.

6.2 The role of insurer characteristics

Our benchmark regressions do not explicitly control for the financial position of insurance companies. Even though insurer*country dummies are included it is possible that more solvent insurers trade differently than less solvent insurers. For example, Ellul et al. (2011) show that the solvency position of insurers matters when assessing selling behaviour in the US corporate bond market. The authors show that insurance companies that are closer to the regulatory minimum solvency sell more distressed bonds compared to more solvent insurers.

In order to investigate the sensitivity of the above results to insurer characteristics we consider three variables to be added to the empirical model of column (4) in Table 2: size, solvency and profitability. First, size is captured by the log of total assets. Second, we measure solvency with the solvency ratio, which is calculated as (available solvency - required solvency)/required solvency. Third, the profit ratio is calculated by net profit/total assets. In order to avoid endogeneity problems we lag the value of these variables by one quarter to ensure that the variables are predetermined. We interact the insurer characteristics with the three within euro-area region dummies to investigate if e.g. less solvents insurers trade Dutch assets differently from South assets. To ensure identification the ROW interaction with the insurer characteristics is excluded. This implies that the coefficients on the insurer characteristic without a region dummy can be interpreted as the effect of the specific insurer characteristic on ROW investments.

[Table 5 about here.]

Table 5 shows the results when including insurer characteristics. Column (1) shows the results with insurer size included in the regression. The coefficients on the interactions between the region dummies and log of total assets suggest that insurer size plays a role in the asset allocation across countries. The F-tests indicate that larger insurers tend to buy more South assets relative to North and Dutch assets compared to smaller insurers. When turning to the F-tests for the coefficients on the crisis phase*region dummies the results show a flight to quality during the sovereign debt crisis as in the benchmark results. Similar to the benchmark regression, there is no evidence of a flight home after including insurer size.

Turning to the importance of the insurer's solvency position it is important to start with the notion that we only observe the Solvency I capital ratio, which is typically not binding and may be different from the risk based capital targets that insurers set for internal purposes. Keeping this caveat in mind, the results in column (2) suggest that more solvent insurers acquire more non-euro assets compared to less solvent insurers. Within the euro area the results suggest that more solvent insurers buy relatively more North and Dutch assets compared to South assets. The standard errors around the coefficient point estimates are very small, rendering all differences in coefficients between NL, North and South statistically significant. However, in terms of economic magnitude, the coefficients are very similar, ranging from -0.006 in South to -0.004 in North.

Even though the solvency position appears to play a role in insurer's investment behaviour, it does not change the results of the benchmark regressions. The F-tests for the coefficients on the crisis phase*region dummies show the same results as obtained before. These findings suggest that changes in the solvency ratio are not the main driver of the flight to quality we observe during the sovereign debt crisis. Interestingly, for banks a shock to their capitalization is often an important reason for a flight home. This effects does not seem to hold for insurance companies.

Next, the regression in column (3) includes the profit ratio in the model. The coefficients indicate that more profitable insurers buy relative more South and North European assets relative to assets from the Netherlands and the rest of the world. However, none of the differences between the coefficients is significant. Adding profitability does not alter the results of the F-tests on the crisis phase*region coefficients, so the benchmark results survive this robustness check as well.

6.3 Sample sensitivity

We now investigate the sensitivity of the results to different sample specifications. In particular, we test the sensitivity of the regression in column (4) in Table 2 when using different sample specifications. Column (1) in Table 6 shows the estimation results when we restrict the sample to a balanced panel by including only insurers that are continuously in the sample during the full 2006-2013 period. Even though the number of observations is halved, the main result does not change. We only observe flight to quality during the sovereign debt crisis and never find evidence for a flight home.

[Table 6 about here.]

In column (2) the sample is restricted to life insurers, which are the dominant type of insurers in our sample when measured by asset size. The assets of life insurers represent about 80% of the assets of all insurers in our sample. The results in column (2) confirm the benchmark results and show that the sub-sample comprising only life insurance companies is representative of the full sample.

Next, we restrict the sample to include only the five largest insurance companies. These are all life insurance companies and account for a significant portion of the total assets held by the Dutch insurance sector. Despite the shrinking of the sample, column (3) shows that the main results are valid as well, albeit a bit weaker, when we only consider the five largest insurance companies.

In the final sensitivity check we investigate if asset trading in small markets drives the results. We restrict the sample to those countries where on average at least 1% of the total insurance sector's assets are invested in. This reduces the sample to nine countries, with the Netherlands included in NL, Austria, Belgium, France and Germany included in North, Italy and Spain in South and the United Kingdom and United States included in ROW. The results in column (4) show that restricting the destination country sample to this smaller set does not change the results.

In sum, the benchmark results are robust to several changes in the sample composition. Neither of the sample restrictions changes the conclusions we reach from the above results. These sensitivity tests show that the results are representative for different subsamples and thereby robust in several important dimensions.

7 Evolution of insurers' home bias

Our main model assesses the existence of a flight to quality or a flight home by analysing insurers' trading in assets between groups of countries. A potential drawback of this approach is that it does not register changes in investment patterns *within* these country groups. Such changes are another potential channel through which a flight home could materialize. After all, if a flight home is explained as a time-varying home bias, it is not unlikely that insurers could decide to swap assets of faraway countries for assets closer to the Netherlands while keeping their credit quality more or less constant - which would likely imply a movement within the groups of northern and southern European countries.

In order to explore whether this phenomenon could impact the findings of our main model, we use an alternative methodology that specifically analyses the evolution of the home bias of Dutch insurers during the crisis. We employ a gravity model for financial assets, which has been widely used in the literature ever since its introduction by Portes and Rey (2005). In this setup, the strength of financial links depends on countries' financial market size and information and transaction costs. Distance, financial sophistication and bilateral trade offer proxies for the latter variables. Within this setup, we test the evolution of investment *positions* throughout our observation period to investigate the evolution of Dutch insurers' home bias. Recall that the dependent variable in Sections 5 and 6 is based on trading behaviour rather than investment positions. Exploring the alternative specification in this section additionally serves as a useful double-check to exclude the possibility that revaluation effects alter insurers' asset portfolio through time in a way that influences our main findings.

We specify the following model:

$$\begin{aligned} log(w_{i,c,t}) = \alpha + \beta_1 log(MktCap_{c,t}) + \beta_2 log(Dist_c) + \beta_3 NL_c \\ \beta_4 FinDev_{c,t} \quad + \quad \beta_5 log(CDS_{c,t}) \quad + \quad \beta_6 Euro_{c,t} \quad + \quad \epsilon_{i,c,t} \end{aligned} \tag{2}$$

In comparison with the methodology used by Portes and Rey, we omit the use of country pairs as all investments originate in the Netherlands. The dependent variable - $w_{i,c,t}$ - is the weight of country c in the portfolio of insurer i in time period t.[16] $MktCap_{c,t}$ is the size of the debt securities market for

[16] Portes and Rey (2005) employ gross investment flows as the dependent variable in their analysis - distinct from the

country c in quarter t as published by the BIS. We would expect the sign of its associated coefficient β_1 to be positive, as a larger market size increases the supply of potential investment opportunities.

$Dist_c$ is the distance between country c and the Netherlands as calculated by CEPII.[17] Its coefficient β_2 is our first variable of interest from a home bias perspective, as it reveals the effect of geographical distance on the propensity to invest. Given the nature of the home bias, we would expect its coefficient to have a negative sign. Our second variable of interest is the dummy for investments in the Netherlands - NL_c - which we add in order to disentangle a general change in preferences to invest close to home with a flight specifically to the Netherlands. The first trend would signal itself through an increase in the coefficient on the distance variable, the second through an increase in the coefficient on the dummy - β_3. In any case, in the existence of a home bias we would expect the dummy to be signed positively.

$FinDev_{c,t}$ represents the WEF Global Competitiveness Score for the development of financial markets for country c in period t. We add it to the analysis as it potentially holds explanatory power regarding information asymmetries. We expect it to enter positively signed, as an increase in sophistication in financial markets would be expected to decrease information asymmetries. To control for the level of investment risk in each country, we add $CDS_{c,t}$ to the specification. This is the CDS spread on the sovereign bonds of country c at the end of period t. As in our main model, we expect a higher level of risk to negatively impact investment. Finally, insurers may want to avoid exchange rate risk on their investments as their liabilities towards policyholders are typically Euro-denominated. Therefore, we control for the existence of exchange rate risk by adding $Euro_{c,t}$, a dummy signalling if country c is part of the Euro zone in period t. If insurers have a preference for avoiding currency risk, the coefficient on this variable should be positive. We take logs of most variables so that we can interpret the results as elasticities. Exceptions are the financial development score and the Netherlands and Euro dummies, due to the nature of these variables.

[Table 7 about here.]

Table 7 shows the estimation results of Equation (2) at different points in time. The first column concerns the the beginning of 2006 - the first available period in our dataset. The remaining columns

net flows in our main model specification. Running the above regression using gross investment flows as the dependent variable yields roughly comparable results to the results presented here.

[17] The CEPII database contains for all countries an internal distance measure. This allows us to include the country pair the Netherlands-the Netherlands in the gravity model. See Head and Mayer (2002) for details about the methodology to calculate this internal distance.

show the results at the end of each of our defined periods. By showing results at the end of each period, we ensure that the cumulated investment decisions made during the period are included.

The explanatory power of the specification is high: we capture roughly 55% to 60% of variance throughout all periods.[18] With one exception, all variables enter with the hypothesized signs. The coefficient for market capitalisation is highly significant and positive. Its value of somewhat below one indicates that an increase in market size feeds through into investment allocations on a nearly one-to-one basis, ceteris paribus. Financial market sophistication likewise has a positive effect on investment allocations, although its coefficient is not always significant. The coefficient on the Euro dummy is remarkably high. Calculating back from the log scale, it indicates that insurers invest *between four to eight times as much* in Euro area countries compared to equivalent non Euro area countries depending on the moment of observation. This provides strong evidence for the motive of insurers to avoid currency risk. The positive and significant sign of the CDS spread in 2006 and at the end of the subprime and post-Lehman periods is remarkable and deviates from the formulated hypothesis. Especially during the pre-crisis period, this could be interpreted as a sign of insurers' tolerance to hold risky assets. The sign for the CDS spread reverses and turns sharply negative during the European debt crisis, consistent with the shedding of risky assets, i.e. flight to quality, observed in our main regression results.

Turning to our variables of interest, the distance variable is significant and negatively signed. Its value is relatively stable throughout our observation period, reaching its least negative value during our last observation moment at the end of 2013. This provides strong evidence that insurers did not reallocate their assets to countries closer to the Netherlands during the crisis.[19] The dummy for the Netherlands enters positively signed in all periods. It starts off in 2006 at a level which signifies that insurers invest - ceteris paribus and again calculating back from the log scale - a factor 3.5 as much in the Netherlands as in other countries. This subsequently drops to a factor 1.5 at the end of the European debt crisis, then rising back to roughly its 2006 value at the end of 2013 conditional on changes in other variables. Given that Figure 2 shows the investment allocation to the Netherlands to be relatively stable, the volatility in the coefficient is likely to be explained by interaction with other

[18] The explanatory power is already high in less sophisticated specifications of the model: a regression of investment shares on market capitalization and distance alone already captures 27% of variance. The table with a stepwise addition of dependent variables is available from the authors.

[19] In fact, adding a country dummy for Germany to the model barely affects the coefficient on distance across all specifications. Moreover, the coefficient on the dummy for Germany is insignificant in all specification, suggesting that there was no "abnormal" demand for German assets during any of the periods.

variables - particularly the time-varying CDS spread differential between the Netherlands and other countries.

In conclusion, the alternative methodology presented in this section does not indicate that Dutch insurers fled home during the financial crisis. They therefore do not provide a rationale to change our conclusions presented in sections 5 and 6. If anything, the results suggest that the home bias of Dutch insurers has *decreased* during the crisis periods, given the decreasing significance of the Netherlands dummy during the height of the crisis and the decreased slope of the distance variable at the end of the crisis.

8 Conclusion

Based on a high quality micro dataset that contains the trading and portfolio positions of individual insurance companies this paper is the first to provide results on insurance companies' international trading during the recent crisis. In particular, we focused on the question if insurers exhibit a flight home or a flight to quality during the different phases of the recent global financial crisis. The case of Dutch insurers offers a valuable perspective, because Dutch insurance companies have relatively large foreign asset positions and face no explicit regulatory constraints on the type and geographical dispersion of assets they hold. An important caveat is that conclusions may differ under other regulatory regimes, for instance where insurance companies have less flexibility to determine their asset allocation. However, with the implementation of Solvency II in Europe, which is closer to the Dutch prudent person supervisory regime, the results in this paper can provide important insights on how other European insurance companies' trading behaviour may behave during future periods of financial stress.

The main findings of this paper indicate that insurance companies engaged in procyclical investment behaviour during the height of the European sovereign debt crisis through the sale of southern European assets. These results are obtained after correcting for country risk and momentum trading strategies, and are robust in several alternative specifications. The results are both statistically significant and the magnitude is economically relevant. The main driver behind this effect is a substantial change of allocation within the portfolio of government bonds. The proceeds were invested in northern European assets in general rather than Dutch assets in particular, i.e. insurers did not increase their holdings of Dutch assets above what may be expected from a flight to quality during the observed period. Also the home bias of Dutch insurers did not increase during the observed period. Therefore we conclude that Dutch insurers fled to quality during this particular crisis period. This behaviour is a roughly similar to what the literature documents for mutual funds, but contrasts with the flight home typically found for in the literature that analyses banks. We find no flight to quality in the periods leading up to the European sovereign debt crisis, and the flight to quality effect disappears after ECB chairman Draghi's mid-2012 speech.

Economists concerned with the ramifications of collapsing capital flows may find some comfort in the fact that insurance companies kept an international diversification of assets during the crisis. This international portfolio offers important diversification benefits, especially during periods of financial stress and when insurers have a risk averse component in their asset allocation decision process. However, the results will on the other hand likely offer little consolation to policymakers in crisis-affected countries, as they show yet another category of investors exit their market in times of crisis. They may similarly create concerns for macroprudential policymakers that expected insurers to always play a stabilizing, contrarian investment role in times of market stress. It is however important to present these findings in the perspective of the European debt crisis, which was severe and took a unique form. The crisis was centered around sovereign risk and thus government bonds. These assets are the largest and typically least risky part of the insurers' investment portfolios in our sample, making the impact of the crisis on their financial position especially high. The crisis may also not have been properly anticipated through capital requirements - which are typically low or zero for government bonds - or other risk management practices. The combination of these factors could have pushed stress levels beyond insurers' maximum risk tolerance, reducing their options to hold on to stressed assets while hoping that market stress would recede in spite of insurance companies' relatively strong equity positions. One could argue that under such circumstances of intense market stress contrarian investment behaviour may only be feasible for market participants with the ability to bear very high levels of risk, such as governments and central banks. In this regard it is telling that the flight to quality stopped once President Draghi remarked that the ECB would do 'whatever it takes' to preserve the Euro. When assessing the question to which extent these results can be generalized, it is noteworthy that we do not find a flight to quality during the other periods studied in our dataset. This includes the Lehman Brothers' crisis phase which saw a more modest divergence in CDS spreads between southern Europe and other regions. This suggests that insurers can withstand a certain level of market stress before engaging in procyclical investment behaviour.

For policymakers, the findings of this paper show that insurance companies can generally be considered to be relatively stable investors, but not by definition. They also point towards the relevance of a stable supply of more or less risk-free assets, given its importance to the insurance sector, and the difficulty of attaining a single capital market in the euro area in absence of this. Policymakers should also take note that the behaviour that we observe for insurers is different from that of banks. Most importantly, insurers are not subject to runs as banks are because of a different liability structure. This means that measures taken to promote the stability of one sector may not always have the intended effect on the other - a differentiated approach may be required.

Following up on the conclusions presented in this paper, an interesting area for future research would be a more generalized framework to assess insurers' response to crises. Such a framework could also be constructed to take into account investment flows between asset classes, in addition to investment flows within asset classes. Further research is also necessary to shed more light on the underlying reasons for the observed investment behaviour. Data limitations seems so far to have hampered research on these topics, especially on a supranational level. The introduction of harmonized and granular asset reporting templates under the European Solvency II framework could in this light be a valuable data source, even if it will only be available from 2016 onwards. These reporting templates contain harmonized data on risk-based capitalisation measures and more granular information on the liability side of insurers' balance sheets, as well as granular information on asset allocations. Additionally, the question of how powerful the potential procyclical feedback loop between transactions and market prices can be deserves further attention to enable policymakers to fully assess the effects of such procyclicality on the financial system.

Finally, this paper considers investment behaviour for the portfolio of tradeable assets held directly by insurers. In future research, it could be interesting to compare this behaviour with the procyclicality - or lack thereof - observed in the investments held through mutual funds on which policyholders themselves typically bear the investment risk. The results of such an analysis would offer clues to policymakers as to which party is best suited to bear investment risk from a financial stability perspective.

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A Appendix A

[Table 8 about here.]

B Appendix B

[Table 9 about here.]

Table 1: Summary statistics insurers
(in EUR mln unless otherwise specified)

	obs	median	mean	st. dev.
Total assets	63	1979.8	7301.3	15475.4
Total premiums	63	359.8	1148.4	1780.9
Net profit	63	260.6	696.5	1086.1
Available solvency margin (in %)	63	94.9	271.6	486.1
Required solvency margin (in %)	63	26.3	46.0	81.3
Solvency ratio (in %)	63	276.2	448.1	482.9

Note: This table presents summary statistics of the insurers in the sample. All variables are from DNB's supervisory statistics. The median, mean and standard deviation are calculated over the 2006-2013 period.

Table 2: Benchmark results: Overall trading

	(1)	(2)	(3)	(4)
subprime*NL	-0.016	-0.010	0.019	0.022
	(0.02)	(0.02)	(0.03)	(0.03)
subprime*North	0.036	0.043	0.084*	0.088*
	(0.03)	(0.03)	(0.04)	(0.04)
subprime*South	0.022	0.034	0.105*	0.112*
	(0.03)	(0.03)	(0.05)	(0.05)
subprime*ROW	0.019	0.027	0.145**	0.156**
	(0.02)	(0.02)	(0.05)	(0.05)
Lehman*NL	0.021	0.030	0.033	0.041
	(0.02)	(0.03)	(0.04)	(0.04)
Lehman*North	0.020	0.029	0.039	0.046
	(0.03)	(0.03)	(0.04)	(0.04)
Lehman*South	-0.051	-0.024	-0.018	0.005
	(0.03)	(0.03)	(0.06)	(0.06)
Lehman*ROW	-0.006	-0.002	0.081	0.092
	(0.02)	(0.02)	(0.05)	(0.05)
debtcrisis*NL	0.048*	0.056*	0.200**	0.211***
	(0.02)	(0.03)	(0.06)	(0.06)
debtcrisis*North	0.028	0.034	0.202**	0.214**
	(0.03)	(0.03)	(0.07)	(0.07)
debtcrisis*South	-0.203***	-0.193***	0.016	0.033
	(0.03)	(0.03)	(0.09)	(0.09)
debtcrisis*ROW	-0.094***	-0.089***	0.155*	0.177**
	(0.02)	(0.02)	(0.07)	(0.07)
postdraghi*NL	0.003	0.012	0.250**	0.254**
	(0.03)	(0.03)	(0.10)	(0.10)
postdragi*North	-0.015	-0.008	0.236*	0.240*
	(0.03)	(0.04)	(0.10)	(0.10)
postdragi*South	-0.115***	-0.108**	0.258	0.261
	(0.03)	(0.03)	(0.13)	(0.13)
postdraghi*ROW	-0.097***	-0.094***	0.202*	0.212*
	(0.02)	(0.02)	(0.08)	(0.08)
relative return(-1)		0.194*		0.131
		(0.09)		(0.11)
subprime*relative return(-1)		-0.165		-0.106
		(0.10)		(0.12)
Lehman*relative return(-1)		-0.195*		-0.132
		(0.09)		(0.11)
debtcrisis*relative return(-1)		-0.191*		-0.131
		(0.09)		(0.11)
postdraghi*relative return(-1)		-0.129		-0.060
		(0.10)		(0.12)
log(CDS spread(-1))			0.003	0.007
			(0.01)	(0.01)
subprime*log(CDS spread(-1))			-0.033	-0.037*
			(0.02)	(0.02)
Lehman*log(CDS spread(-1))			-0.006	-0.011
			(0.01)	(0.01)
debtcrisis*log(CDS spread(-1))			-0.041*	-0.047*
			(0.02)	(0.02)
postdraghi*log(CDS spread(-1))			-0.060*	-0.064**
			(0.02)	(0.02)
insurer*country dummies	yes	yes	yes	yes
R2	0.13	0.12	0.10	0.10
N	28145	26814	18054	17870

Continued on next page

Table 2: Benchmark results: Overall trading

	(1)	(2)	(3)	(4)
P(subprime*NL = subprime*North)	0.15	0.18	0.11	0.11
P(subprime*NL = subprime*South)	0.31	0.26	0.07	0.06
P(subprime*North = subprime*South)	0.75	0.85	0.69	0.64
P(Lehman*NL = Lehman*North)	0.99	0.98	0.88	0.91
P(Lehman*NL = Lehman*South)	0.08	0.21	0.29	0.46
P(Lehman*North = Lehman*South)	0.09	0.23	0.23	0.40
P(debtcrisis*NL = debtcrisis*North)	0.56	0.58	0.98	0.95
P(debtcrisis*NL = debtcrisis*South)	0.00	0.00	0.00	0.00
P(debtcrisis*North = debtcrisis*South)	0.00	0.00	0.00	0.00
P(postdraghi*NL = postdraghi*North)	0.70	0.69	0.79	0.79
P(postdraghi*NL = postdraghi*South)	0.01	0.01	0.90	0.91
P(postdraghi*North = postdraghi*South)	0.04	0.04	0.73	0.74

Note: This table shows the estimation results of estimating Equation (1) using fixed effects at the insurer*country pair level. The dependent variable is $log(T_{i,c,t}) - log(T_{i,t})$, the net acquisition of country c assets by insurer i during period t and scaled by the average net trading of insurer i across all countries. The scaling by $log(T_{i,t})$ obsoletes the use of insurer*quarter fixed effects. See Section 4.2 for the definitions of $log(T_{i,c,t})$ and $log(T_{i,t})$. The sample consists of quarterly observations from 2006 until 2013. Standard errors in parentheses are corrected for heteroskedasticity and clustered at the insurer*country level. *,** and *** denote significance at the 10%, 5% and 1%, respectively. The bottom of the table reports the p-values on coefficient equality for coefficients mentioned in the left column.

Table 3: Benchmark results: By asset class

	Equity	Gov Bonds	MFI bonds	OFI bonds	NFC bonds
subprime*NL	-0.003	0.096	0.077	-0.018	0.072
	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)
subprime*North	0.098*	0.076	-0.076	0.080	0.056
	(0.04)	(0.05)	(0.04)	(0.07)	(0.06)
subprime*South	0.144*	-0.011	0.078	-0.109	0.237**
	(0.06)	(0.11)	(0.08)	(0.08)	(0.08)
subprime*ROW	0.037	0.040	0.103	-0.096	0.159
	(0.06)	(0.14)	(0.07)	(0.07)	(0.09)
Lehman*NL	0.015	0.035	0.044	-0.005	-0.000
	(0.05)	(0.10)	(0.06)	(0.06)	(0.08)
Lehman*North	-0.086	-0.061	-0.149*	0.074	0.061
	(0.06)	(0.08)	(0.07)	(0.08)	(0.07)
Lehman*South	-0.070	-0.262	-0.064	-0.019	0.111
	(0.09)	(0.14)	(0.09)	(0.11)	(0.11)
Lehman*ROW	0.008	-0.196	0.015	-0.031	0.120
	(0.07)	(0.18)	(0.07)	(0.08)	(0.08)
debtcrisis*NL	0.210*	0.560***	0.215*	0.086	-0.140
	(0.10)	(0.11)	(0.09)	(0.08)	(0.10)
debtcrisis*North	0.166	0.439***	0.063	0.126	-0.061
	(0.10)	(0.12)	(0.08)	(0.10)	(0.10)
debtcrisis*South	0.173	0.062	0.086	0.070	-0.195
	(0.15)	(0.17)	(0.12)	(0.12)	(0.15)
debtcrisis*ROW	0.198	0.361	0.136	0.053	-0.044
	(0.10)	(0.19)	(0.09)	(0.09)	(0.11)
postdraghi*NL	0.016	0.166	-0.085	0.128	0.223
	(0.07)	(0.19)	(0.18)	(0.21)	(0.22)
postdragi*North	-0.083	0.109	-0.289	0.015	0.338
	(0.09)	(0.18)	(0.19)	(0.25)	(0.24)
postdragi*South	-0.134	-0.042	-0.307	0.058	0.432
	(0.12)	(0.27)	(0.26)	(0.30)	(0.31)
postdraghi*ROW	-0.043	-0.181	-0.111	0.099	0.368
	(0.07)	(0.23)	(0.17)	(0.19)	(0.20)
relative return(-1)	0.175	0.032	-0.024	-0.207	1.519
	(0.11)	(0.14)	(0.06)	(0.28)	(1.05)
subprime*relative return(-1)	-0.131	-0.085	0.352**	0.180	-1.476
	(0.13)	(0.14)	(0.12)	(0.28)	(1.05)
Lehman*relative return(-1)	-0.175	-0.040	0.030	0.211	-1.520
	(0.11)	(0.14)	(0.06)	(0.28)	(1.05)
debtcrisis*relative return(-1)	-0.162	-0.025	0.037	0.203	-1.514
	(0.11)	(0.14)	(0.06)	(0.28)	(1.05)
postdraghi*relative return(-1)	-0.193	-0.293	0.097	0.337	-1.393
	(0.12)	(0.83)	(0.30)	(0.30)	(1.11)
log(CDS spread(-1))	0.007	-0.058	-0.039	-0.045	0.102***
	(0.01)	(0.04)	(0.02)	(0.03)	(0.03)
subprime*log(CDS spread(-1))	-0.024	-0.023	-0.006	0.055	-0.094**
	(0.02)	(0.05)	(0.03)	(0.03)	(0.03)
Lehman*log(CDS spread(-1))	-0.007	0.064	0.054*	0.042	-0.074*
	(0.02)	(0.04)	(0.03)	(0.04)	(0.03)
debtcrisis*log(CDS spread(-1))	-0.056*	-0.064	-0.002	0.017	-0.044
	(0.03)	(0.05)	(0.03)	(0.04)	(0.04)
postdraghi*log(CDS spread(-1))	-0.005	0.017	0.065	0.011	-0.152**
	(0.02)	(0.06)	(0.05)	(0.06)	(0.06)
insurer*country dummies	yes	yes	yes	yes	yes
R2	0.11	0.14	0.11	0.15	0.15
N	7199	10355	10489	7849	9588

Continued on next page

Table 3: Benchmark results: By asset class

	Equity	Gov Bonds	MFI bonds	OFI bonds	NFC bonds
P(subprime*NL = subprime*North)	0.01	0.76	0.01	0.19	0.83
P(subprime*NL = subprime*South)	0.01	0.31	0.99	0.25	0.05
P(subprime*North = subprime*South)	0.37	0.31	0.05	0.03	0.01
P(Lehman*NL = Lehman*North)	0.01	0.33	0.00	0.28	0.44
P(Lehman*NL = Lehman*South)	0.17	0.03	0.19	0.86	0.26
P(Lehman*North = Lehman*South)	0.81	0.03	0.24	0.30	0.55
P(debtcrisis*NL = debtcrisis*North)	0.29	0.07	0.02	0.62	0.27
P(debtcrisis*NL = debtcrisis*South)	0.63	0.00	0.14	0.84	0.58
P(debtcrisis*North = debtcrisis*South)	0.93	0.00	0.77	0.56	0.13
P(postdraghi*NL = postdraghi*North)	0.02	0.47	0.00	0.26	0.13
P(postdraghi*NL = postdraghi*South)	0.04	0.15	0.05	0.53	0.09
P(postdraghi*North = postdraghi*South)	0.50	0.25	0.86	0.73	0.38

Note: This table shows the estimation results of estimating Equation (1) for different assets classes using fixed effects at the insurer*country pair level. The dependent variable is $log(T_{i,c,s,t}) - log(T_{i,s,t})$, the net acquisition of sector s assets in country c by insurer i during period t and scaled by the average net trading of insurer i in sector s assets across all countries. The scaling by $log(T_{i,s,t})$ obsoletes the use of insurer*quarter fixed effects. See Section 4.2 for the definitions of $log(T_{i,c,t})$ and $log(T_{i,t})$. The sample consists of quarterly observations from 2006 until 2013. Standard errors in parentheses are corrected for heteroskedasticity and clustered at the insurer*country level. *,** and *** denote significance at the 10%, 5% and 1%, respectively. The bottom of the table reports the p-values on coefficient equality for coefficients mentioned in the left column.

Table 4: CAPM target

	(1)	(2)	(3)	(4)
subprime*NL	0.023	0.013	0.027	0.025
	(0.03)	(0.04)	(0.03)	(0.04)
subprime*North	0.073	0.056	0.081	0.072
	(0.04)	(0.04)	(0.04)	(0.04)
subprime*South	0.076	0.047	0.093	0.076
	(0.06)	(0.07)	(0.05)	(0.07)
subprime*ROW	0.115*	0.095	0.122*	0.107
	(0.05)	(0.06)	(0.05)	(0.06)
Lehman*NL	0.020	0.075	0.012	0.068
	(0.05)	(0.06)	(0.05)	(0.05)
Lehman*North	0.038	0.059	0.037	0.055
	(0.05)	(0.06)	(0.05)	(0.05)
Lehman*South	-0.032	0.003	-0.028	0.002
	(0.07)	(0.08)	(0.06)	(0.07)
Lehman*ROW	0.042	0.074	0.043	0.076
	(0.06)	(0.06)	(0.05)	(0.06)
debtcrisis*NL	0.214**	0.227**	0.194**	0.215**
	(0.07)	(0.07)	(0.07)	(0.07)
debtcrisis*North	0.204**	0.210**	0.188**	0.208**
	(0.07)	(0.07)	(0.07)	(0.07)
debtcrisis*South	0.007	0.011	-0.007	0.019
	(0.10)	(0.10)	(0.09)	(0.09)
debtcrisis*ROW	0.128	0.124	0.129	0.138*
	(0.07)	(0.07)	(0.07)	(0.07)
postdraghi*NL	0.096	0.067	0.213*	0.212*
	(0.09)	(0.09)	(0.10)	(0.10)
postdragi*North	0.065	0.032	0.190	0.188
	(0.09)	(0.10)	(0.10)	(0.11)
postdragi*South	0.001	-0.054	0.185	0.172
	(0.12)	(0.13)	(0.14)	(0.15)
postdraghi*ROW	0.053	0.021	0.140	0.137
	(0.08)	(0.08)	(0.09)	(0.09)
rel_return(-1)	0.147	0.123	0.152	0.128
	(0.13)	(0.12)	(0.13)	(0.12)
subprime*rel_return(-1)	-0.061	-0.101	-0.062	-0.104
	(0.16)	(0.12)	(0.16)	(0.12)
Lehman*rel_return(-1)	-0.137	-0.124	-0.146	-0.130
	(0.13)	(0.12)	(0.13)	(0.12)
debtcrisis*rel_return(-1)	-0.145	-0.123	-0.152	-0.128
	(0.13)	(0.12)	(0.13)	(0.12)
postdraghi*rel_return(-1)	0.099	0.088	-0.077	-0.060
	(0.18)	(0.18)	(0.13)	(0.12)
log(cds spread(-1))	-0.008	-0.013	-0.001	-0.003
	(0.01)	(0.01)	(0.01)	(0.01)
subprime*log(cds spread(-1))	-0.020	-0.012	-0.027	-0.020
	(0.02)	(0.02)	(0.02)	(0.02)
Lehman*log(cds spread(-1))	0.007	0.002	0.002	-0.004
	(0.02)	(0.02)	(0.02)	(0.02)
debtcrisis*log(cds spread(-1))	-0.033	-0.028	-0.035	-0.036
	(0.02)	(0.02)	(0.02)	(0.02)
postdraghi*log(cds spread(-1))	-0.011	0.004	-0.046	-0.042
	(0.03)	(0.03)	(0.03)	(0.03)
Δ debt capm gap(-1)	0.009***			
	(0.00)			
subprime*Δ debt capm gap(-1)	0.001			
	(0.00)			

Continued on next page

Table 4: CAPM target

	(1)	(2)	(3)	(4)
Lehman*Δ debt capm gap(-1)	-0.001			
	(0.00)			
debtcrisis*Δ debt capm gap(-1)	-0.002			
	(0.00)			
postdraghi*Δ debt capm gap(-1)	-0.001			
	(0.00)			
Δ log(debt capm share(-1))		0.294*		
		(0.14)		
subprime*Δ log(debt capm share(-1))		-0.005		
		(0.01)		
Lehman*Δ log(debt capm share(-1))		-0.005		
		(0.01)		
debtcrisis*Δ log(debt capm share(-1))		-0.002		
		(0.01)		
postdraghi*Δ log(debt capm share(-1))		0.015		
		(0.02)		
Δ equity capm gap(-1)			0.009***	
			(0.00)	
subprime*Δ equity capm gap(-1)			0.001	
			(0.00)	
Lehman*Δ equity capm gap(-1)			-0.000	
			(0.00)	
crisis*Δ equity capm gap(-1)			-0.002	
			(0.00)	
postdraghi*Δ equity capm gap(-1)			-0.001	
			(0.00)	
Δ log(equity capm share(-1))				0.153
				(0.08)
subprime*Δ log(equity capm share(-1))				-0.002
				(0.01)
Lehman*Δ log(equity capm share(-1))				-0.003
				(0.01)
equitycrisis*Δ log(equity capm share(-1))				-0.001
				(0.01)
postdraghi*Δ log(equity capm share(-1))				0.009
				(0.02)
insurer*country dummies	yes	yes	yes	yes
r2	0.11	0.11	0.11	0.11
N	16175	16308	16975	17112
P(subprime*NL = subprime*North)	0.27	0.33	0.23	0.29
P(subprime*NL = subprime*South)	0.33	0.55	0.21	0.35
P(subprime*North = subprime*South)	0.96	0.87	0.83	0.95
P(Lehman*NL = Lehman*North)	0.71	0.73	0.61	0.78
P(Lehman*NL = Lehman*South)	0.40	0.20	0.49	0.22
P(Lehman*North = Lehman*South)	0.20	0.30	0.23	0.32
P(debtcrisis*NL = debtcrisis*North)	0.83	0.72	0.90	0.88
P(debtcrisis*NL = debtcrisis*South)	0.00	0.00	0.00	0.00
P(debtcrisis*North = debtcrisis*South)	0.00	0.00	0.00	0.00
P(postdraghi*NL = postdraghi*North)	0.60	0.55	0.71	0.68
P(postdraghi*NL = postdraghi*South)	0.18	0.09	0.71	0.58
P(postdraghi*North = postdraghi*South)	0.33	0.19	0.95	0.81

Note: This table shows the estimation results of estimating Equation (1) using fixed effects at the insurer*country pair level with changes in CAPM target weights included as additional independent variables. The dependent variable is $log(T_{i,c,t}) - log(T_{i,t})$, the net acquisition of country c assets by insurer i during period t and scaled by the average net trading of insurer i across all countries. The scaling by $log(T_{i,t})$ obsoletes the use of insurer*quarter fixed effects. See Section 4.2 for the definitions of $log(T_{i,c,t})$ and $log(T_{i,t})$. The sample consists of quarterly observations from 2006 until 2013. Standard errors in parentheses are corrected for heteroskedasticity and clustered at the insurer*country level. *,** and *** denote significance at the 10%, 5% and 1%, respectively. The bottom of the table reports the p-values on coefficient equality for coefficients mentioned in the left column.

Table 5: Insurer characteristics

	(1)	(2)	(3)
subprime*NL	0.026	0.023	0.017
	(0.03)	(0.03)	(0.02)
subprime*North	0.121**	0.104*	0.095*
	(0.04)	(0.04)	(0.04)
subprime*South	0.131*	0.113*	0.094
	(0.06)	(0.05)	(0.05)
subprime*ROW	0.193**	0.163**	0.155**
	(0.06)	(0.05)	(0.05)
Lehman*NL	0.056	0.057	0.058
	(0.05)	(0.05)	(0.05)
Lehman*North	0.075	0.062	0.072
	(0.05)	(0.05)	(0.05)
Lehman*South	0.031	0.018	0.031
	(0.07)	(0.06)	(0.06)
Lehman*ROW	0.130*	0.102	0.094
	(0.06)	(0.06)	(0.06)
debtcrisis*NL	0.225***	0.217***	0.204**
	(0.07)	(0.07)	(0.06)
debtcrisis*North	0.242***	0.219**	0.209**
	(0.07)	(0.07)	(0.07)
debtcrisis*South	0.036	0.020	0.007
	(0.10)	(0.09)	(0.09)
debtcrisis*ROW	0.212**	0.170*	0.153*
	(0.08)	(0.07)	(0.07)
postdraghi*NL	0.262**	0.256**	0.257**
	(0.10)	(0.09)	(0.09)
postdragi*North	0.262**	0.240*	0.248*
	(0.10)	(0.10)	(0.10)
postdragi*South	0.240	0.232	0.238
	(0.14)	(0.13)	(0.13)
postdraghi*ROW	0.233*	0.190*	0.187*
	(0.09)	(0.08)	(0.08)
relative return(-1)	0.125	0.128	0.120
	(0.11)	(0.11)	(0.11)
subprime*relative return(-1)	-0.104	-0.107	-0.101
	(0.12)	(0.12)	(0.12)
Lehman*relative return(-1)	-0.126	-0.129	-0.122
	(0.11)	(0.11)	(0.11)
debtcrisis*relative return(-1)	-0.127	-0.130	-0.122
	(0.11)	(0.11)	(0.11)
postdraghi*relative return(-1)	-0.049	-0.054	-0.046
	(0.12)	(0.12)	(0.12)
log(cds spread(-1))	0.017	0.003	0.003
	(0.02)	(0.01)	(0.01)
subprime*log(cds spread(-1))	-0.046*	-0.034	-0.032
	(0.02)	(0.02)	(0.02)
Lehman*log(cds spread(-1))	-0.021	-0.008	-0.007
	(0.02)	(0.02)	(0.02)
debtcrisis*log(cds spread(-1))	-0.056*	-0.041*	-0.037
	(0.02)	(0.02)	(0.02)
postdraghi*log(cds spread(-1))	-0.069*	-0.055*	-0.054*
	(0.03)	(0.02)	(0.02)
NL*log(assets(-1))	-0.004		
	(0.01)		
North*log(assets(-1))	-0.009		
	(0.01)		

Continued on next page

Table 5: Insurer characteristics

	(1)	(2)	(3)
South*log(assets(-1))	0.008		
	(0.01)		
ROW*log(assets(-1))	-0.010		
	(0.01)		
NL*solvency ratio (-1)		0.001***	
		(0.00)	
North*solvency ratio (-1)		0.003	
		(0.00)	
South*solvency ratio (-1)		0.000	
		(0.00)	
ROW*solvency ratio (-1)		0.006**	
		(0.00)	
NL*profit ratio (-1)			0.433
			(0.73)
North*profit ratio (-1)			0.968
			(0.51)
South*profit ratio (-1)			1.294*
			(0.60)
ROW*profit ratio (-1)			0.141
			(0.40)
insurer*country dummies	yes	yes	yes
r2	0.11	0.10	0.11
N	17105	16933	17105
P(subprime*NL = subprime*North)	0.04	0.07	0.05
P(subprime*NL = subprime*South)	0.07	0.08	0.11
P(subprime*North = subprime*South)	0.87	0.87	0.99
P(Lehman*NL = Lehman*North)	0.67	0.89	0.76
P(Lehman*NL = Lehman*South)	0.68	0.44	0.60
P(Lehman*North = Lehman*South)	0.40	0.36	0.39
P(debtcrisis*NL = debtcrisis*North)	0.72	0.97	0.90
P(debtcrisis*NL = debtcrisis*South)	0.01	0.00	0.00
P(debtcrisis*North = debtcrisis*South)	0.00	0.00	0.00
P(postdraghi*NL = postdraghi*North)	1.00	0.74	0.86
P(postdraghi*NL = postdraghi*South)	0.77	0.69	0.76
P(postdraghi*North = postdraghi*South)	0.76	0.89	0.88
P(NL*log(assets(-1)) = North*log(assets(-1)))	0.76		
P(NL*log(assets(-1)) = South*log(assets(-1)))	0.03		
P(North*log(assets(-1)) = South*log(assets(-1)))	0.02		
P(NL*solvency ratio (-1) = North*solvency ratio (-1))		0.03	
P(NL*solvency ratio (-1) = South*solvency ratio (-1))		0.03	
P(North*solvency ratio (-1) = South*solvency ratio (-1))		0.03	
P(NL*profit ratio (-1) = North*profit ratio (-1))			0.43
P(NL*profit ratio (-1) = South*profit ratio (-1))			0.25
P(North*profit ratio (-1) = South*profit ratio (-1))			0.18

Note: This table shows the estimation results of estimating Equation (1) using fixed effects at the insurer*country pair level with insurer characteristics (total assets, solvency ratio and profit ratio) included as additional independent variables. The dependent variable is $log(T_{i,c,t}) - log(T_{i,t})$, the net acquisition of country c assets by insurer i during period t and scaled by the average net trading of insurer i across all countries. The scaling by $log(T_{i,t})$ obsoletes the use of insurer*quarter fixed effects. See Section 4.2 for the definitions of $log(T_{i,c,t})$ and $log(T_{i,t})$. The sample consists of quarterly observations from 2006 until 2013. Standard errors in parentheses are corrected for heteroskedasticity and clustered at the insurer*country level. *,** and *** denote significance at the 10%, 5% and 1%, respectively. The bottom of the table reports the p-values on coefficient equality for coefficients mentioned in the left column.

Table 6: Sensitivity

	(1)	(2)	(3)	(4)
subprime*NL	0.064	0.023	-0.013	0.025
	(0.06)	(0.03)	(0.03)	(0.03)
subprime*North	0.108	0.074	-0.032	0.068
	(0.08)	(0.05)	(0.05)	(0.04)
subprime*South	0.119	0.111	0.102	0.088
	(0.11)	(0.07)	(0.09)	(0.07)
subprime*ROW	0.271*	0.114	0.050	0.071
	(0.11)	(0.08)	(0.07)	(0.07)
Lehman*NL	0.022	0.062	0.138	0.148*
	(0.06)	(0.05)	(0.08)	(0.06)
Lehman*North	0.077	0.122*	0.126	0.127*
	(0.06)	(0.06)	(0.09)	(0.06)
Lehman*South	0.009	0.125	0.165	0.089
	(0.09)	(0.08)	(0.12)	(0.09)
Lehman*ROW	0.135	0.143	0.170	0.103
	(0.08)	(0.08)	(0.10)	(0.09)
debtcrisis*NL	0.300**	0.188**	0.111	0.118
	(0.09)	(0.07)	(0.09)	(0.07)
debtcrisis*North	0.329***	0.210*	0.077	0.069
	(0.10)	(0.08)	(0.10)	(0.07)
debtcrisis*South	0.085	0.052	-0.041	-0.076
	(0.13)	(0.11)	(0.14)	(0.09)
debtcrisis*ROW	0.306**	0.189*	0.115	0.002
	(0.12)	(0.09)	(0.10)	(0.07)
postdraghi*NL	0.431**	0.218	0.273	0.345**
	(0.15)	(0.12)	(0.16)	(0.13)
postdragi*North	0.403*	0.236	0.236	0.349**
	(0.16)	(0.13)	(0.17)	(0.13)
postdragi*South	0.428*	0.257	0.280	0.379*
	(0.22)	(0.17)	(0.23)	(0.17)
postdraghi*ROW	0.414**	0.195	0.189	0.267*
	(0.15)	(0.11)	(0.14)	(0.11)
relative return(-1)	0.111	0.401	0.311	-0.017
	(0.22)	(0.35)	(0.23)	(0.09)
subprime*relative return(-1)	-0.105	-0.393	-0.390	0.054
	(0.23)	(0.36)	(0.29)	(0.10)
Lehman*relative return(-1)	-0.109	-0.443	-0.942*	0.016
	(0.22)	(0.36)	(0.44)	(0.09)
debtcrisis*relative return(-1)	-0.064	-0.389	-0.290	0.020
	(0.23)	(0.35)	(0.23)	(0.09)
postdraghi*relative return(-1)	-0.035	-0.350	-0.259	0.012
	(0.22)	(0.36)	(0.23)	(0.28)
log(CDS spread(-1))	0.014	0.010	-0.005	-0.027
	(0.03)	(0.02)	(0.02)	(0.02)
subprime*log(CDS spread(-1))	-0.059	-0.029	0.001	-0.007
	(0.04)	(0.03)	(0.03)	(0.03)
Lehman*log(CDS spread(-1))	-0.008	-0.029	-0.030	-0.010
	(0.03)	(0.02)	(0.03)	(0.03)
debtcrisis*log(CDS spread(-1))	-0.069*	-0.046	-0.015	0.009
	(0.03)	(0.03)	(0.03)	(0.02)
postdraghi*log(CDS spread(-1))	-0.104*	-0.058	-0.057	-0.053
	(0.04)	(0.03)	(0.04)	(0.03)
insurer*country dummies	yes	yes	yes	yes
R2	0.09	0.12	0.07	0.07
N	8915	7891	2973	10187

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Table 6: Sensitivity

	(1)	(2)	(3)	(4)
P(subprime*NL = subprime*North)	0.63	0.30	0.68	0.32
P(subprime*NL = subprime*South)	0.59	0.20	0.17	0.32
P(subprime*North = subprime*South)	0.92	0.60	0.11	0.75
P(Lehman*NL = Lehman*North)	0.45	0.17	0.89	0.61
P(Lehman*NL = Lehman*South)	0.88	0.37	0.79	0.36
P(Lehman*North = Lehman*South)	0.39	0.96	0.72	0.54
P(debtcrisis*NL = debtcrisis*North)	0.69	0.59	0.24	0.26
P(debtcrisis*NL = debtcrisis*South)	0.03	0.04	0.03	0.00
P(debtcrisis*North = debtcrisis*South)	0.00	0.01	0.06	0.01
P(postdraghi*NL = postdraghi*North)	0.71	0.70	0.36	0.94
P(postdraghi*NL = postdraghi*South)	0.98	0.63	0.94	0.65
P(postdraghi*North = postdraghi*South)	0.80	0.78	0.63	0.67

Note: This table shows the estimation results of estimating Equation (1) using fixed effects at the insurer*country pair level. The dependent variable is $log(T_{i,c,t}) - log(T_{i,t})$, the net acquisition of country c assets by insurer i during period t and scaled by the average net trading of insurer i across all countries. The scaling by $log(T_{i,t})$ obsoletes the use of insurer*quarter fixed effects. See Section 4.2 for the definitions of $log(T_{i,c,t})$ and $log(T_{i,t})$. The sample consists of quarterly observations from 2006 until 2013. Column (1) restricts the sample to a balanced panel, column (2) includes only life insurers and column (3) only the five largest insurers as measured by total assets. Column (4) excludes all countries where on average less than 1% of the total insurance sector's assets are invested in. Standard errors in parentheses are corrected for heteroskedasticity and clustered at the insurer*country level. *,** and *** denote significance at the 10%, 5% and 1%, respectively. The bottom of the table reports the p-values on coefficient equality for coefficients mentioned in the left column.

Table 7: Investment shares during different time periods

	1/1/2006	pre-crisis	subprime	post-lehman	debt crisis	post-Draghi
log(Capital Market size)	0.738***	0.769***	0.746***	0.873***	0.633***	0.722***
	(0.05)	(0.06)	(0.06)	(0.05)	(0.06)	(0.07)
log(Geographical Distance)	-0.342***	-0.347***	-0.435***	-0.360***	-0.403***	-0.214***
	(0.05)	(0.04)	(0.05)	(0.04)	(0.07)	(0.05)
Netherlands dummy	1.298***	1.176***	0.719***	0.685***	0.482*	1.275***
	(0.16)	(0.14)	(0.17)	(0.14)	(0.20)	(0.19)
Financial Development	0.338*	0.091	0.467**	0.687***	0.665	0.486*
	(0.14)	(0.12)	(0.15)	(0.17)	(0.33)	(0.23)
log(CDS spread)	0.155**	-0.007	0.349**	0.356*	-0.768**	-0.585**
	(0.05)	(0.11)	(0.12)	(0.16)	(0.25)	(0.20)
Euro dummy	2.017***	1.624***	1.570***	1.406***	2.099***	1.724***
	(0.23)	(0.24)	(0.16)	(0.19)	(0.18)	(0.17)
R2	0.574	0.565	0.575	0.571	0.611	0.575
N	699	688	648	544	403	404

Note: Columns (1)-(6) show results of the estimation of Equation (2) at 1/1/2006 and the end of each time period, based on a balanced panel of insurers. The dependent variable is the log weight of each country in the insurer's asset portfolio, i.e. $log(w_{i,c,t})$. Robust standard errors are shown in parentheses. *,** and *** denote significance at the 10%, 5% and 1%, respectively.

Table 8: OLS regression without fixed effects

	(1)	(2)	(3)	(4)
NL	-0.021	-0.028	-0.027	-0.028
	(0.02)	(0.02)	(0.02)	(0.02)
North	-0.060***	-0.077***	-0.076**	-0.076**
	(0.02)	(0.02)	(0.02)	(0.02)
South	-0.024	-0.040*	-0.050	-0.051
	(0.02)	(0.02)	(0.04)	(0.04)
ROW	-0.072***	-0.081***	-0.105*	-0.106*
	(0.01)	(0.01)	(0.04)	(0.04)
subprime*NL	-0.004	0.003	0.052	0.053*
	(0.02)	(0.02)	(0.03)	(0.03)
subprime*North	0.058	0.076*	0.138***	0.140***
	(0.03)	(0.03)	(0.04)	(0.04)
subprime*South	0.017	0.029	0.139*	0.136*
	(0.03)	(0.03)	(0.06)	(0.06)
subprime*ROW	0.069***	0.078***	0.256***	0.257***
	(0.02)	(0.02)	(0.06)	(0.06)
Lehman*NL	0.033	0.040	0.085*	0.089*
	(0.02)	(0.02)	(0.04)	(0.04)
Lehman*North	0.040	0.058*	0.104*	0.106*
	(0.02)	(0.03)	(0.04)	(0.04)
Lehman*South	-0.025	-0.002	0.060	0.070
	(0.03)	(0.03)	(0.06)	(0.06)
Lehman*ROW	0.044**	0.055***	0.174**	0.177**
	(0.02)	(0.02)	(0.06)	(0.06)
debtcrisis*NL	0.056**	0.063**	0.242***	0.247***
	(0.02)	(0.02)	(0.05)	(0.05)
debtcrisis*North	0.052*	0.070**	0.263***	0.269***
	(0.02)	(0.02)	(0.06)	(0.06)
debtcrisis*South	-0.155***	-0.140***	0.112	0.119
	(0.03)	(0.03)	(0.08)	(0.08)
debtcrisis*ROW	-0.012	-0.002	0.253***	0.260***
	(0.02)	(0.02)	(0.07)	(0.07)
postdraghi*NL	0.009	0.016	0.298***	0.300***
	(0.02)	(0.02)	(0.09)	(0.09)
postdragi*North	0.016	0.033	0.309**	0.310**
	(0.03)	(0.03)	(0.10)	(0.10)
postdragi*South	-0.024	-0.009	0.408**	0.409**
	(0.03)	(0.03)	(0.13)	(0.13)
postdraghi*ROW	0.024	0.032	0.324***	0.324***
	(0.02)	(0.02)	(0.09)	(0.09)
relative return(-1)		0.145		0.129
		(0.07)		(0.11)
subprime*relative return(-1)		-0.128		-0.129
		(0.08)		(0.12)
Lehman*relative return(-1)		-0.144		-0.130
		(0.07)		(0.11)
debtcrisis*relative return(-1)		-0.140		-0.128
		(0.07)		(0.11)
postdraghi*relative return(-1)		-0.089		-0.088
		(0.08)		(0.12)
log(CDS spread(-1))			0.005	0.006
			(0.02)	(0.02)
subprime*log(CDS spread(-1))			-0.053*	-0.053*
			(0.02)	(0.02)
Lehman*log(CDS spread(-1))			-0.020	-0.021
			(0.02)	(0.02)

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Table 8: OLS regression without fixed effects

	(1)	(2)	(3)	(4)
debtcrisis*log(CDS spread(-1))			-0.052*	-0.054**
			(0.02)	(0.02)
postdraghi*log(CDS spread(-1))			-0.072**	-0.072**
			(0.03)	(0.03)
insurer*country dummies	no	no	no	no
R2	0.01	0.01	0.01	0.01
N	28145	26814	18054	17870
P(subprime*NL = subprime*North)	0.09	0.06	0.04	0.04
P(subprime*NL = subprime*South)	0.58	0.51	0.13	0.15
P(subprime*North = subprime*South)	0.36	0.31	1.00	0.94
P(Lehman*NL = Lehman*North)	0.82	0.61	0.62	0.65
P(Lehman*NL = Lehman*South)	0.11	0.28	0.64	0.73
P(Lehman*North = Lehman*South)	0.09	0.14	0.38	0.47
P(debtcrisis*NL = debtcrisis*North)	0.90	0.82	0.53	0.53
P(debtcrisis*NL = debtcrisis*South)	0.00	0.00	0.02	0.02
P(debtcrisis*North = debtcrisis*South)	0.00	0.00	0.00	0.00
P(postdraghi*NL = postdraghi*North)	0.87	0.67	0.79	0.80
P(postdraghi*NL = postdraghi*South)	0.37	0.51	0.09	0.09
P(postdraghi*North = postdraghi*South)	0.36	0.34	0.11	0.11

Note: This table shows the estimation results of estimating Equation (1) using OLS at the insurer*country pair level. The dependent variable is $log(T_{i,c,t}) - log(T_{i,t})$, the net acquisition of country c assets by insurer i during period t and scaled by the average net trading of insurer i across all countries. The scaling by $log(T_{i,t})$ obsoletes the use of insurer*quarter fixed effects. See Section 4.2 for the definitions of $log(T_{i,c,t})$ and $log(T_{i,t})$. The sample consists of quarterly observations from 2006 until 2013. Standard errors in parentheses are corrected for heteroskedasticity and clustered at the insurer*country level. *,** and *** denote significance at the 10%, 5% and 1%, respectively. The bottom of the table reports the p-values on coefficient equality for coefficients mentioned in the left column.

Table 9: Winsorized tails

	All asset classes	Equity	Gov Bonds	MFI bonds	OFI bonds	NFC bonds
subprime*NL	0.010	0.005	0.057	0.063	-0.008	0.063
	(0.02)	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)
subprime*North	0.044	0.099**	0.043	-0.063*	0.028	0.050
	(0.03)	(0.04)	(0.05)	(0.03)	(0.04)	(0.05)
subprime*South	0.056	0.139**	-0.066	0.036	-0.071	0.203**
	(0.04)	(0.05)	(0.09)	(0.06)	(0.05)	(0.07)
subprime*ROW	0.110**	0.034	-0.009	0.028	-0.054	0.147*
	(0.03)	(0.05)	(0.12)	(0.05)	(0.05)	(0.07)
Lehman*NL	0.022	0.012	-0.012	0.063	-0.006	0.003
	(0.04)	(0.05)	(0.08)	(0.05)	(0.04)	(0.07)
Lehman*North	-0.008	-0.085	-0.060	-0.116*	0.006	0.044
	(0.03)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
Lehman*South	-0.036	-0.076	-0.247*	-0.051	-0.022	0.095
	(0.05)	(0.08)	(0.11)	(0.07)	(0.07)	(0.08)
Lehman*ROW	0.038	-0.016	-0.163	-0.021	-0.026	0.103
	(0.04)	(0.06)	(0.14)	(0.05)	(0.05)	(0.06)
debtcrisis*NL	0.171***	0.134	0.447***	0.155*	0.095	-0.135
	(0.05)	(0.07)	(0.09)	(0.07)	(0.06)	(0.08)
debtcrisis*North	0.145**	0.082	0.341***	0.010	0.120*	-0.071
	(0.05)	(0.08)	(0.10)	(0.06)	(0.06)	(0.08)
debtcrisis*South	-0.008	0.076	-0.017	0.018	0.095	-0.198
	(0.07)	(0.11)	(0.14)	(0.10)	(0.08)	(0.12)
debtcrisis*ROW	0.123*	0.103	0.260	0.045	0.090	-0.043
	(0.05)	(0.08)	(0.16)	(0.06)	(0.06)	(0.09)
postdraghi*NL	0.196**	-0.028	0.142	-0.057	0.160	0.192
	(0.08)	(0.06)	(0.16)	(0.13)	(0.12)	(0.16)
postdragi*North	0.168*	-0.103	0.091	-0.217	0.094	0.307
	(0.08)	(0.07)	(0.15)	(0.13)	(0.13)	(0.17)
postdragi*South	0.196	-0.148	-0.043	-0.245	0.122	0.357
	(0.11)	(0.10)	(0.23)	(0.18)	(0.17)	(0.23)
postdraghi*ROW	0.164*	-0.081	-0.132	-0.118	0.135	0.334*
	(0.06)	(0.06)	(0.19)	(0.12)	(0.11)	(0.14)
relative return(-1)	0.050	0.157	-0.049	-0.030	-0.367	0.904
	(0.05)	(0.10)	(0.12)	(0.05)	(0.23)	(0.59)
subprime*relative return(-1)	-0.037	-0.160	0.012	0.343***	0.342	-0.833
	(0.06)	(0.11)	(0.12)	(0.10)	(0.24)	(0.62)
Lehman*relative return(-1)	-0.049	-0.158	0.043	0.037	0.370	-0.867
	(0.05)	(0.10)	(0.12)	(0.05)	(0.23)	(0.60)
debtcrisis*relative return(-1)	-0.051	-0.149	0.059	0.038	0.358	-0.844
	(0.05)	(0.10)	(0.12)	(0.05)	(0.24)	(0.59)
postdraghi*relative return(-1)	0.014	-0.191	0.063	0.106	0.514*	-0.672
	(0.06)	(0.11)	(0.60)	(0.27)	(0.25)	(0.71)
log(CDS spread(-1))	0.001	0.005	-0.062	-0.045**	-0.025	0.084***
	(0.01)	(0.01)	(0.03)	(0.02)	(0.01)	(0.02)
subprime*log(CDS spread(-1))	-0.024	-0.027	-0.004	0.019	0.028	-0.082**
	(0.01)	(0.02)	(0.04)	(0.03)	(0.02)	(0.03)
Lehman*log(CDS spread(-1))	-0.000	-0.004	0.061	0.054**	0.024	-0.062**
	(0.01)	(0.02)	(0.04)	(0.02)	(0.02)	(0.02)
debtcrisis*log(CDS spread(-1))	-0.033*	-0.036	-0.040	0.022	-0.003	-0.032
	(0.01)	(0.02)	(0.04)	(0.02)	(0.02)	(0.03)
postdraghi*log(CDS spread(-1))	-0.046*	0.005	0.019	0.064	-0.014	-0.129**
	(0.02)	(0.02)	(0.05)	(0.03)	(0.03)	(0.04)
insurer*country dummies	yes	yes	yes	yes	yes	yes
R2	0.10	0.11	0.15	0.10	0.11	0.16

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Table 9: Winsorized tails

	All asset classes	Equity	Gov Bonds	MFI bonds	OFI bonds	NFC bonds
N	17870	7199	10355	10489	7849	9563
P(subprime*NL = subprime*North)	0.25	0.00	0.78	0.01	0.43	0.81
P(subprime*NL = subprime*South)	0.24	0.00	0.17	0.69	0.22	0.04
P(subprime*North = subprime*South)	0.76	0.37	0.12	0.10	0.06	0.01
P(Lehman*NL = Lehman*North)	0.34	0.01	0.48	0.00	0.77	0.51
P(Lehman*NL = Lehman*South)	0.15	0.09	0.02	0.11	0.75	0.21
P(Lehman*North = Lehman*South)	0.46	0.87	0.02	0.26	0.59	0.41
P(debtcrisis*NL = debtcrisis*North)	0.41	0.12	0.05	0.00	0.53	0.25
P(debtcrisis*NL = debtcrisis*South)	0.00	0.32	0.00	0.07	1.00	0.41
P(debtcrisis*North = debtcrisis*South)	0.00	0.91	0.00	0.91	0.64	0.08
P(postdraghi*NL = postdraghi*North)	0.48	0.02	0.45	0.01	0.18	0.06
P(postdraghi*NL = postdraghi*South)	1.00	0.04	0.13	0.04	0.58	0.08
P(postdraghi*North = postdraghi*South)	0.55	0.43	0.22	0.72	0.69	0.53

Note: This table shows the estimation results of estimating Equation (1) using fixed effects at the insurer*country pair level. The dependent variable in column (1) is $log(T_{i,c,t}) - log(T_{i,t})$, the net acquisition of country c assets by insurer i during period t and scaled by the average net trading of insurer i across all countries. The scaling by $log(T_{i,t})$ obsoletes the use of insurer*quarter fixed effects. See Section 4.2 for the definitions of $log(T_{i,c,t})$ and $log(T_{i,t})$. The regressions in columns (2)-(6) consider $log(T_{i,c,s,t}) - log(T_{i,s,t})$ as dependent variable, thereby only analyzing a single asset class in each column (equities, government bonds, MFI bonds, OFI bonds and NFC bonds). The sample consists of quarterly observations from 2006 until 2013. Standard errors in parentheses are corrected for heteroskedasticity and clustered at the insurer*country level. *,** and *** denote significance at the 10%, 5% and 1%, respectively. The bottom of the table reports the p-values on coefficient equality for coefficients mentioned in the left column.

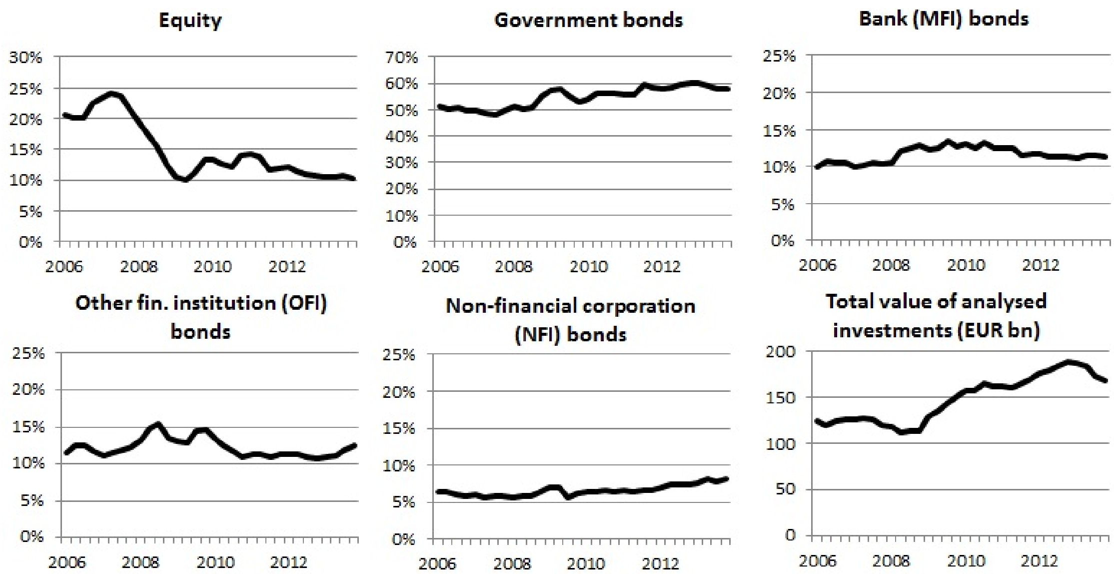

Figure 1: Investment distribution per asset class (in % of total) and total invested assets (in EUR bn), end of quarter

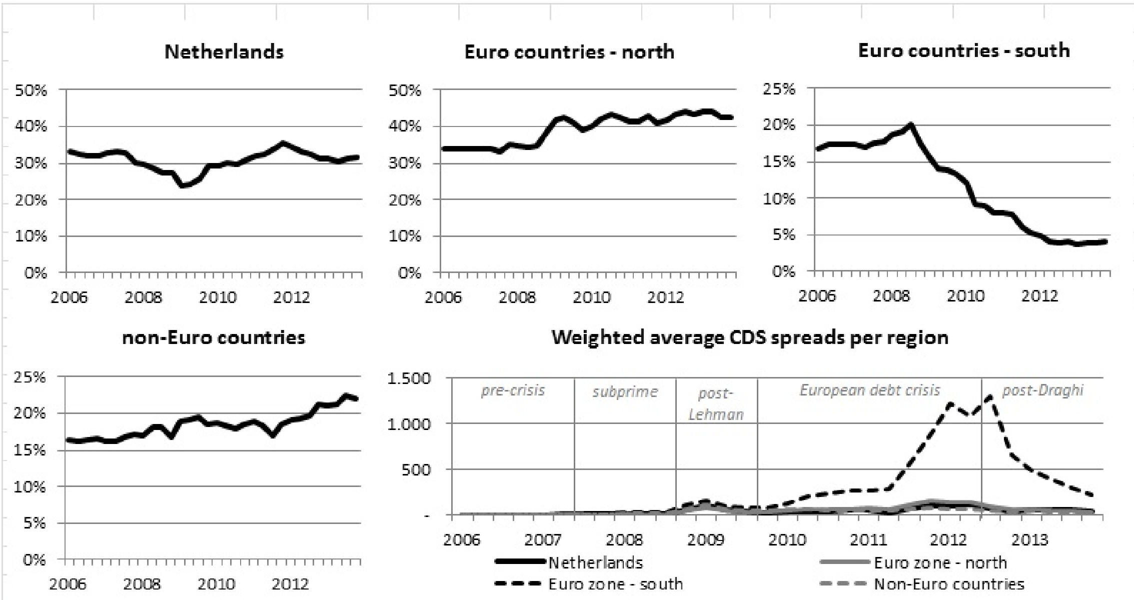

Figure 2: Investment distribution (in %) and average weighted CDS spreads (in basis points) per region, end of quarter

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