How does the Eurozone crisis affect securities portfolios?

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Abstract

We investigate if the Eurozone crisis affected the composition of security portfolios of households and non-financial firms. Using a unique dataset for all securities holdings by German investors, we exploit plausibly exogenous variation in the exposure to securities issued by stressed Eurozone economies in Greece, Ireland, Italy, Portugal, and Spain, to offer the first comparison of how these two types of investors respond to the European sovereign debt crisis. Difference-in-differences tests show that households, unlike non-financial firms, rebalance their portfolios by moving from bonds to stocks and from securities issued by financial institutions to securities issued by non-financials.

Keywords: asset allocation; sovereign debt crisis; household finance; Eurozone; quasi-natural experiment
JEL codes: D12; D13; G11; G21

1. Introduction

The Eurozone crisis which started in late 2009 triggered substantial losses in capital markets. In particular, the associated wealth shock resulted in declines in the value of securities portfolios for investors who held securities from the stressed Eurozone (SEZ) economies Greece, Ireland, Italy, Portugal, and Spain. Stock markets lost 88% from their peak in Greece, 32% in Ireland, 45% in Italy, 47% in Portugal and 51% in Spain. Bond markets also suffered massively. In spring 2010, Greek, Irish, and Portuguese government bonds were downgraded, followed by another round of downgrades in 2011 when credit rating agencies awarded the same treatment to Italian and Spanish government bonds.

In this paper, we ask how the Eurozone crisis affects asset allocation choices using difference-in-differences (DiD) analysis. As we explain in greater detail below, we define treatment on the basis of the extent of exposure to securities from SEZ economies in banks' client portfolios. A key innovation in our research is the focus on two important types of investors: households and non-financial firms.[2] We analyze this question using data from Germany, a key country in the Eurozone. While the implications of an outright bankruptcy of Greece would have likely caused extreme economic losses even for Germany, cultural factors led to strong opposition towards any aid to Greece and other distressed Eurozone economies (Guiso, Herrera, and Morelli (2013)). Because of German citizens' deeply rooted negative attitude towards moral hazard, it is therefore arguable that German investors reacted strongly to the SEZ crisis. Empirically testing how different types of German investors respond to this crisis is the subject of this study.

Importantly, we hypothesize that the decline in value of sovereign bonds from SEZ economies motivates households and non-financial firms with substantial holdings of securities issued in

[2] The classification of households and non-financial corporations in this study follows the standards of the European System of (national and regional) Accounts (ESA). ESA is consistent with the System of National Accounts of the United Nations and allows comparison of industry sectors across different EU statistics.

SEZ to reallocate assets in terms of portfolio concentration levels, measured by Herfindahl-Hirschman Indices (HHIs), across different asset classes and issuers. Our analyses for asset classes differentiate between investments in shares, bonds, and mutual funds. The tests for the type of issuer distinguish between governments, non-financial firms and credit institutions. Moreover, for each of these three categories, we distinguish between domestic issuers, SEZ issuers, and other foreign (that is, excluding SEZ) issuers. Our objective in this paper is to explore whether such reactions result in changes in portfolio allocation.

For this research, we leverage a unique and comprehensive dataset from the Deutsche Bundesbank, the Securities Holdings Statistics (Statistik über Wertpapierinvestments) that provides information about *all* bank clients' security holdings in *all* German banks for the period 2005 to 2012. To the best of our knowledge, this dataset is the only one that allows a distinction between investments into SEZ economies by the entire population of investors in one country. Moreover, the distinction in our database between securities portfolios held by households and non-financial firms permits a key innovation in the literature. We are the first to compare investment behavior and allocation preferences of these two distinct groups of investors. As we discuss more specifically below, a substantial body of literature exists about how households manage their portfolios but very little is known about portfolio choices of non-financial firms. Our research offers a first stab at contrasting these two types of bank clients whose investment behavior is likely to differ as a result of dissimilar investment objectives.

Our unique setting with both annual and quarterly data for more than 2,000 banks and a median number of 1,600 securities deposit accounts per bank aggregates the data to the bank level. The raw data is available at the security-bank level but does not permit assigning securities to individual customers' portfolios. The benefit of this aggregation process is fourfold.

First, we are able to document changes in asset allocation that are related to the 'average' bank customer. Given the large number of banks and customer deposit accounts in the sample, our in-

ferences are unlikely to be driven by the behavior of a limited number of investors per bank. Moreover, there is no reason to believe *a priori* that the size distribution of the customer deposit accounts is dissimilar across banks. Therefore, aggregating the security-level data to the bank level is unlikely to produce significantly different results from those that would have been obtained from client-level data. This assumption is confirmed by robustness tests that rule out that the bank type (private, savings, or cooperative), the bank business model (that is, banks with or without extensive proprietary trading activities), or bank size affect our main findings.

Second, identification concerns also suggest that aggregating the data to the bank level is beneficial. Since it is impossible for individual customers to have information on asset allocation choices of all other customers of the bank, we are able to rule out self-selection problems. As part of this analysis, we also document that the probability of the average customer's portfolio having a large proportion of investments in securities issued in SEZ economies does not systematically correlate with bank characteristics. Moreover, one of the key assumptions of the DiD estimator is that treatment is exogenous, that is, being in the treatment group is not related to portfolio concentration. Since exposure to securities from SEZ is expected to cause investors to change asset allocation, our main analysis assigns a bank to the treatment group if the customers' portfolio share of securities from SEZ exceeds the sample median in 2009. This choice of the timing of treatment is consistent with Lane (2012). He states that the European sovereign debt crisis entered a new stage with several European countries reporting larger than expected increases in deficit to GDP ratios in late 2009. Moreover, Guiso, Herrera, and Morelli (2013) argue that Germans reacted in October 2009 to the announcement that the Greek government 'cooked' the books by considering to 'punish' Greece by denying timely help, despite the possibility that timely corrective action could have effectively limited the ensuing crisis. Subsequent sensitivity checks confirm that moving the beginning of the crisis by several quarters does not affect our results, and a series of placebo regressions also confirm our inferences. We can also rule out poten-

tially confounding events. In particular, we show that the portfolio rebalancing is not driven by the 2007-2009 financial crisis.

Third, our aggregation process avoids that we have to distinguish between portfolios managed by banks' advisors on behalf of the customers and portfolios managed by the clients with the support of banks' advisors upon the clients' request. In fact, some investors may not even seek advice prior to adjusting their portfolio in response to the wealth shock. Likewise, we avoid potentially detrimental effects of banks' proprietary trading activities on the performance of customer portfolios as shown in recent work by Fecht, Hackethal, and Karabulut (2013).

Fourth, the aggregation to the bank-level allows the inclusion of bank-fixed effects to rule out time-invariant factors such as bank-specific cultural traits that impact on asset allocation. Additionally, we can also rule out that portfolio choices are affected by different financial advisory practices in different banks and by different financial advisors within the same bank.

We acknowledge two limitations of our data. One, the level of aggregation we use for this study renders the inclusion of client-fixed effects infeasible. The raw data are available on a security-bank level and allow distinguishing between household investors and non-financial firms but do not contain information that allow identifying individual customer portfolios. Therefore, we cannot empirically establish whether the changes in portfolio allocation we document are driven by increased risk aversion of individual investors or negative experiences with certain types of asset classes that make investors revise their beliefs about particular securities classes or issuers. This, however, is not essential for the purpose of our analysis. Even if the distribution of different securities is skewed at the individual client level (a small number of portfolios may account for a large value of securities at the bank level), the implications in terms of overall holdings of different categories of securities remain unaltered. Moreover, the level of aggregation makes our paper easily comparable to other papers that employ this dataset (for example, Fecht, Hackethal and Karabulut (2013)). Second, we do not observe other asset markets, for example, real estate.

Our narrow focus on securities is warranted since the interest of this study lies in the short run reactions of securities investors to the Eurozone shock rather than in long-term asset allocation choices.

Our paper contributes to a strand of different literatures. First, portfolio allocation is a cornerstone in financial economics since the pioneering work by Markowitz (1952, 1959). Several studies have shown that individuals and households tend to hold under-diversified portfolios (Kelly (1995); Polkovnichenko (2005); Calvet, Campbell, and Sodini (2007); Goetzmann and Kumar (2008)). This finding does not necessarily mean that higher concentration leads to poor portfolio performance. In fact, studies on portfolio concentration of both professional and individual investors have provided evidence of positive 'returns to concentration' (Kacperczyk, Sialm, and Zheng (2005); Ivković, Sialm, and Weisbenner (2008)). We contribute to this large literature by presenting well-identified novel evidence for a causal effect of a major macroeconomic shock originating at the periphery of the Eurozone on portfolio concentration levels for the population of German household and non-financial firm investors.

Second, we also contribute to the literature on household finance. These studies are primarily concerned with cross-country variation for asset allocation (Carroll, Slacalek, and Tokuoka (2014)), demographic determinants of stock market participation and rebalancing of portfolios (Haliassos and Bertaut (1995); Guiso, Jappelli, and Terlizzese (1996)), and the distribution of portfolio risk borne by households (Bucciol and Miniaci (forthcoming)). Unlike these papers, our study examines how households adjust asset allocation in response to a macroeconomic shock, and, moreover, allows directly comparing the investment behavior of households relative to non-financial firms.

Third, recent work on the Eurozone is also relevant for this research. Lane (2012) offers a detailed account of the evolution of the European sovereign debt crisis, and Battistini, Pagano, and Simonelli (2014) focus on whether sovereign portfolios of banks react to yield differentials in the

Eurozone. Other recent work on this matter, however, typically focuses on macroeconomic aspects, with a particular emphasis on fiscal policy. Gosh et al. (2013) develop new measures for a maximum level of public debt which remains compatible with fiscal policy, and Corsetti et al. (2013) focus on the nexus between fiscal policy, monetary policy, and macroeconomic stability in the context of sovereign risk. Sovereign debt holdings by banks in the Eurozone are subject of the study by Becker and Ivashina (2014). They document that a larger share of sovereign bond holdings crowds out corporate lending, and this effect is more pronounced for riskier sovereign bonds. In contrast to these studies, we exploit the sovereign debt problems in the Eurozone as an exogenous shock to study how the population of investors in one of the largest economies in the world alter their securities portfolio holdings in response to problems originating in stressed economies of the Eurozone.

To empirically establish how the Eurozone crisis affects portfolio choices, we rely on a quasi-experimental setup with DiD estimation. As part of our econometric exercise we also document the validity of the two key identifying assumptions of the exogeneity of treatment and the existence of parallel trends between treatment and control group.

Our key result, unique in the literature, highlights that investors whose portfolios are held by banks for which the aggregate share of the client portfolios invested in SEZ securities is large (treatment group) respond strongly to the Eurozone crisis: concentration in household portfolios for this group of banks decreases to a larger extent in comparison to banks whose aggregate customer investments display relatively smaller portfolio share invested in SEZ (control group). We can rule out that this result is driven by banks with intensive proprietary trading activities, and we also demonstrate that customers neither differ systematically across different bank types nor do they match endogenously to their banks.

We illustrate our key result as follows: the decrease in household portfolio concentration in terms of issuers for the treatment group amounts to 2.1%, that is, it is three times as large as for

the control group (0.7%). Given that the median securities portfolio is 28,285 Euros, this suggests that households decrease their average bond holding by 1,321 Euros. This reduction is economically significant, as compared to the sample median, and is equivalent to around 4.6% of initial bond holdings. The results also confirm an increase in stock holdings of 235.39 Euros, which represents 13.8% of the sample median for the average household account (1,703 Euros).[3] We also document an intuitive shift in households' portfolios away from securities issued by financial institutions towards securities issued by non-financial corporations. In particular, we find a reduction in the average nominal value of the holdings referring to financial institutions' securities equal to 2,079 Euros (around 8% of the sample median), and an increase in the average corresponding figure for non-financial corporations equal to 913.60 Euros (around 41% of the sample median). Given that bank customers can hardly blame their financial advisors for the Eurozone crisis, it is unlikely that our results are affected by inflows and outflows of customers from one bank to another. Robustness tests reported in Section 5.2 confirm this hypothesis.

Moreover, we provide evidence of another phenomenon not previously documented in the literature: Non-financial firms, unlike households, do not respond to the wealth shock by rebalancing their portfolios. While a set of theories about household finance exists which may help explain these changes in portfolio composition with disagreggated data on the security level, we are not aware of any theories that predict how non-financial firms respond to such a wealth shock. Our work therefore can be seen as an intial exploration of a phenomenon that has received little attention in the literature.

Our research is important for the following reasons: First, households and non-financial firms control large proportions of the investable savings in a society. Understanding their responsiveness to macroeconomic shocks can shed light on the implications of their portfolio reallocations.

[3] These numbers refer to nominal values. As reported below, while for bonds the nominal values are very close to the market values, the market values are much higher for stocks: The average stock holding for the median bank's customer is 15,184 Euros.

Second, the literature on the impact of macroeconomic shocks on portfolio allocation is, at best, sparse. Despite some theoretical work on the impact of financial wealth shocks on consumption (Leahy and Zeira (2005)), little is known about the consequences of shocks arising from declines in the value of a certain class of securities. Third, the literature has so far focused almost exclusively on the role of households for investment decisions. While non-financial firms tend to hold sizeable securities portfolios, comparisons between the portfolio allocation preferences of households and those of non-financial firms are virtually nonexistent.

The rest of the paper is structured as follows. Section 2 provides a brief overview on the market for asset management and financial advice in Germany. This section also presents additional details about our dataset. We discuss our econometric strategy in Section 3. Section 4 shows the main results and Section 5 discusses threats to identification and presents tests that rule out alternative explanations. Section 6 concludes.

2. Institutional background and data

2.1. Asset management and financial advice in Germany

This section gives an overview of the German asset management market. Since German banks play a major role in this market, this brief survey also provides an outline of the German banking system. Unlike in the U.S. and the UK where broker dealers that trade securities both for their own account and also on behalf of customers occupy a considerable market share, these services are provided almost exclusively by banks in Germany. The banking sector is characterized by a three-pillar system: private-sector banks, public-sector banks, and cooperatives. The private-sector pillar contains regionally and nationwide active banks, as well as small banks operating in local markets, owned by sole proprietors, business partners, or in the form of limited and public limited companies. Public-sector banks include savings banks and Landesbanks owned by governments at the city-, county-, or state-level. The cooperative pillar comprises mutually owned cooperative banks and central credit cooperatives. Importantly, savings banks and cooperative

banks operate in geographically delimited markets, typically defined by county borders, and hence follow a regional principle with their business activities. We exploit this unique feature of geographical segmentation in Section 5.3 below.

All German universal banks provide asset management services, and offer financial advice. These activities are regulated in specific provisions of the German Banking Act which define the custodian services that include, *inter alia*, buying and selling of shares on behalf of customers.

Usually, German bank customers maintain a strong relationship with their bank, known as the 'housebank' principle, which implies that most clients have their security investments at the same bank as their cash account (Elsas and Krahnen (1998)). A consequence of these close ties between banks and their customers is that it is unlikely that customers maintain multiple securities deposit accounts with different banks. Similar to U.S. investors, about 80% of German investors seek advice prior to making an investment decision (Bhattacharya et al. (2012)). While 20% rely on an independent financial advisor, more than 66% seek advice from their bank (Bluethgen et al. (2008)).

2.2. Data

We match the Securities Holdings Statistics (Statistik über Wertpapierinvestments) with information on financial data at the bank level and macroeconomic indicators. All data are provided by the Deutsche Bundesbank. The Securities Holdings Statistics is available both at annual and quarterly frequency, but the bank level data only at an annual frequency. Our main tests therefore rely on annual data.

The Securities Holdings Statistics contains data regarding the securities holdings of households and non-financial firms at the bank level. There ara four advantages of this dataset. First, the data represent the entire population of *all* households' and *all* non-financial firms' securities portfolios held with *all* German banks. The former category comprises typical retail investors, consisting of employed individuals, freelancers, professionals, and majorities of individuals such as married

couples. Non-financial firms are public and private law corporations such as limited companies and public limited companies as well as business partnerships.[4] These two types of investors are likely to differ in terms of their behavior. Non-financial firms may have different investment objectives than households, and are also likely to be more sophisticated. In contrast, households may be more likely to be subject to behavioral biases and rely on heuristics when making investment decisions. Second, we are able to analyze asset allocation decisions in response to an important wealth shock for one of the largest economies in the world. With total financial assets worth 4.3 trillion Euros, German households are one of the biggest holders of financial wealth in the European Union. The value of the 24 million portfolios held by German households represented in our dataset adds up to 790 billion Euros. Hence, about one fifth of the households' financial assets is held in securities. Including the 484 billion Euros in the portfolios of non-financial firms, which are also represented in our data, the total sum of assets rises to nearly 1.3 trillion Euros. In short, our study considers assets with an overall value of around half of the German GDP. Moreover, holdings of financial assets in Germany are in size, participation rate and in distribution over the different assets types comparable to other Eurozone countries. Table 1 presents a cross-country comparison using OECD data of the financial assets holdings of France, Germany, Italy, Japan, Spain, the UK and the U.S. Total financial assets of households per capita in Germany are similar in size to those in France and Italy. Thus, the representativeness of our sample lends credibility to the findings in terms of their external validity, and allows generalizing from our results to other high income economies. Third, for each bank, our data allow us to compute several different measures of portfolio concentration. Following previous literature (Bhattacharya et al. (2012); Dorn, Huberman, and Sengmueller (2008); Ivković, Sialm, and Weisbenner (2008); Hoechle et al. (2013)), we employ the HHI as a measure of concentration: The lower the HHI, the lower the concentration (and the better the diversification). We compute

[4] All non-financial firms engage in selling and buying of goods and services of non-financial character and typically strive to make a profit, irrespective of firms' ownership structure. This classification includes all industrial sectors except for monetary financial institutions.

HHIs for bonds, shares, and mutual funds for the analyses for asset classes. For the tests of issuer concentration, we calculate HHIs for countries (domestic vs. foreign, with a further decomposition into SEZ and non-SEZ countries), and in terms of sectors (governments, non-financial corporations, and financial institutions). We choose this classification because asset class, geographic location, and industry are widely recognized by the asset allocation literature as the main criteria for improving portfolio diversification. While the typical choice for investors is in terms of asset class, distinguishing among issuers enables us to observe changes in the 'risk-free asset' share (that is, German government bonds). The tests that separate HHIs between foreign and domestic securities allow us to discern whether German investors exploit the benefits of international diversification (which are known at least since Levy and Sarnat (1970)), and the extent to which the Eurozone crisis increased home bias because of a 'flight to quality'. Finally, the distinction between securities issued by non-financial corporations and financial institutions is helpful because of the linkages between the sovereign debt market and the domestic financial sector (Grammatikos and Vermeulen (2012); Mody and Sandri (2012)). Four, we have information on both nominal and market value of all securities. By focusing on the securities' nominal value we are able to rule out by construction that changes in portfolio concentration are driven by changes in prices (passive rebalancing) rather than active trading on the part of investors (active rebalancing). We obtain information on the market value and nominal value of the security holdings based on asset class (bonds, stocks, or mutual funds), type of issuer (government, non-financial corporation, or financial institution), and country of origin (Germany, SEZ, or other countries). Considering the permutations between the country of origin and sector subcategories, we have in total nine components for HHI by issuer, and three for HHI by asset class. For stocks the nominal value per share is calculated by dividing the book value of equity by the number of stocks outstanding. Negative market or nominal values indicate short positions. The category of mutual funds comprises both open and close ended funds, exchange traded funds and money market mutual funds.

[Insert Table 1 here]

Figure 1 shows the market value of stocks for the median portfolio and number of accounts for the median bank. The financial crisis had a strong effect on both of these measures. The drop in the number of accounts reduces the overall number of stocks held by bank clients, reinforcing the drop in the market value of stocks in the median portfolio.

[Insert Figure 1 here]

Table 2 reports descriptive statistics for the HHI measures and their related components. We present these summary statistics for both nominal and market values. However, for the subsequent empirical analysis we focus on changes in nominal values, similar to Hildebrand, Rocholl, and Schulz (2012). This allows ruling out that changes in portfolio composition are a result of passive rebalancing driven by changes in security prices. We also report descriptive statistics regarding the security accounts for each bank. Our sample covers 2,138 banks, and the median bank has 1,574 household security accounts and six non-financial firm accounts.

[Insert Table 2 here]

3. Econometric strategy

Portfolio concentration is measured by the HHI:

$$HHI = \sum_{i=1}^{N} s_i^2 \qquad (1)$$

where s_i is the share of the security category i = 1,2,..., N in the portfolio.

Exogenous shocks can generate active portfolio rebalancing. We follow a DiD approach to estimate the impact of the European sovereign debt crisis on the degree of concentration of bank customers' portfolios. The DiD technique compares a treatment group with a control group prior to and following treatment to establish causal effects by focusing on the group differences. In our

main specification, the treatment group consists of banks for which the share of SEZ (that is, total nominal value of SEZ securities over total nominal value of the portfolio) was larger than the 2009 sample median. The post-treatment period is 2009-2012, while the pre-treatment period is 2005-2008. Our baseline specification is based on the following regression with standard errors clustered at the bank level (Bertrand, Duflo, and Mullainathan (2004)):

$$Y_{it} = \beta_0 + Crisis_t\beta_1 + (Crisis_t \times Treatment_i)\beta_2 + \mathbf{X_{it}}\boldsymbol{\beta_3} + u_i + \gamma_t + \varepsilon_{it} \qquad (2)$$

where Y_{it} is the value taken by the HHI measure of interest in year t, u_i denotes bank-fixed effects, and γ_t denotes year-fixed effects. The dummy variable $Treatment_i$ takes on the value one if bank i belongs to the treatment group, and zero otherwise and, being time-invariant, is unidentified in the regressions because of the inclusion of bank-fixed effects. $Crisis_t$ takes on the value one if $\{t = 2009, 2010, 2011, 2012\}$, and zero otherwise, and $\mathbf{X_{it}}$ is a $1\times k$ vector of covariates ($\boldsymbol{\beta_3}$ is a $k \times 1$ parameter vector) comprising bank-specific variables as well as macroeconomic indicators at the regional level: *Fee Income Share*, and *County Real Income Growth*. The parameter β_2 is the coefficient of interest and represents the differential impact that the Eurozone crisis has on customers of banks in the treatment group. For convenience, in the rest of the paper we refer to $(Crisis_t \times Treatment_i)$ as *Interaction*.

We consider six different dependent variables: *HHI-Asset class*, *HHI-Asset class* (*Households*), *HHI-Asset class* (*non-financial Firms*) *HHI-Issuer*, *HHI-Issuer* (*Households*), and *HHI-Issuer* (*non-financial Firms*).

We define *Fee Income Share* as fee income to total bank's income. We expect this variable to be negatively related to concentration, since investing in a wider range of financial products should generate more income for the bank due to higher transaction volume.[5] Finally, to allow for re-

[5] Mullainathan, Nöth, and Schoar (2010) provide evidence that financial advisers encourage customers to implement trading strategies involving higher fees and a larger transaction volume. Fee-generating activities (such as brokerage) have recently become more important, to compensate for the ongoing decline in interest margins.

gional characteristics, we control for *County Real Income Growth*.[6] This variable can proxy for investment opportunities (Paravisini (2008)), as well as for changes in income risk following changes in local economic conditions (Angerer and Lam (2009)). The coefficient on *County Real Income Growth* could be positive if investors decrease the level of portfolio concentration to offset discount-rate risk during periods of low economic growth (Fama and French (1989)). However, a negative coefficient is consistent with the view that higher local economic growth brings down risk aversion, leading to an increase in the weight of classes of risky securities relative to German government bonds.

4. Main results

4.1. Impact of the Eurozone sovereign debt crisis

Table 3 reports our main results for the DiD regressions for the Eurozone crisis on portfolio concentration using annual data.[7] We report the results for regressions with year-fixed effects. When the year-fixed effects are replaced by a proxy for changes in the yield curve (*Yield Curve Spread*),[8] the results are robust in terms of sign and significance of the coefficients, although the overall explanatory power of the models decreases. This is consistent with year-fixed effects capturing time-varying macroeconomic characteristics that are not correlated with the yield curve spread.

The coefficient of interest, β_2, is negative and significant for the following dependent variables: *HHI-Asset Class*, *HHI-Asset Class (Households)*, *HHI-Issuer*, and *HHI-Issuer (Households)*. This indicates that households tend to decrease portfolio concentration in terms of asset classes, while for

6 Because of the regional principle, most of the banks in our sample have branches located only in one county. For banks in more than one county, we use the county where the bank's headquarters are located.

7 The proportion of SEZ share for banks in the treatment group is larger for non-financial firms than for households.There are in total 861 banks for which the share of SEZ is larger than the sample median for 2009.

8 This variable is the difference in yields between long-term government bonds (seven years maturity) and short-term government bonds (one year maturity).

non-financial firms the results are insignificant.[9] The coefficient is positive and weakly significant in three cases out of four for the regressions on the non-financial firms portfolios. These results suggest that households and non-financial firms respond differently to shocks in the value of their security portfolio.

The impact of being in the treatment group is economically significant. For instance, considering the results for the regressions using year-fixed effects, while *HHI-Issuer (Households)* for the control group decreases on average by 0.7% as a result of the crisis, for the treatment group the decrease is 2.1%; for firm portfolios, the crisis decreases the HHI in terms of issuer by 2.0% for the control group, but for the treatment group the decrease is just 0.8%. Being in the treatment group, therefore, changes the effects of the crisis on HHI substantially.

The coefficient on *Fee Income Share* is either positive and significant or insignificant, while the coefficient on *County Real Income Growth* is either negative and significant or insignificant. This suggests that customer portfolios for banks that rely more on nontraditional banking activities are less concentrated. The results for *County Real Income Growth* are consistent with the view that higher local economic growth brings about an increase in the number of security classes in the portfolio.

4.2. Quantifying the effects

What drives these results? How do bank clients decrease portfolio concentration across different asset classes and types of issuer? To answer these questions, we repeat estimation of model (2) for all components of *HHI-Asset Class* and *HHI-Issuer*, again using annual data. As before, we consider nominal values, and the regressions are run with the same explanatory variables as for equation (2).

[9] To account for the censored nature of our dependent variables, we replicate these tests using Tobit models (not reported). These tests, available upon request, yield virtually identical results.

The first three columns in Table 4 present the analysis of changes in the components of *HHI-Asset Class* (the share of bonds, stocks, and mutual funds to total securities) for the full sample. Panel A shows that β_2 is positive and significant for the share of stocks, while it is negative and significant for the share of bonds (0.019 and –0.019, respectively). The change in the share of mutual funds is negligible. These results confirm that the decrease in portfolio concentration occurs as a consequence of the Eurozone crisis, and this occurs because of a migration from bonds to equities.

To illustrate the economic magnitude of the rebalancing of households, Panel B in Table 4 reports the results for regressions using household portfolios only, in terms of both intensive margins (share of the portfolios invested in stocks or bonds to total securities) and in terms of average values (in Euros). The results confirm the reduction in the share of bonds (-0.022), corresponding to a reduction in the bond holding of 1,321 Euros. This reduction is economically significant, and it represents 4.6% of the median bond holding for the average household account (28,285 Euros, see Table 3). The results also confirm an increase in the share of stocks (0.022), corresponding to an increase in the stock holding of 235.60 Euros, which represents 13.8% of the median stock holding for the average household account (1,703 Euros, see Table 3).

The results for the components of *HHI-Issuer* (reported in columns four to seven of Table 4, Panel A) confirm those on *HHI-Asset Class*: β_2 is negative and significant for securities issued by either foreign (excluding SEZ) or domestic financial institutions (–0.019 in both cases), and positive and significant for securities issued by foreign (excluding SEZ) and domestic non-financial corporations (0.016 and 0.013, respectively). As shown in Table 2, securities issued by the financial sector (both domestic and foreign) make up a large portion of bank customer portfolios. The shift towards the non-financial sector, hence, decreases concentration. Panel B of Table 4 shows that the shift from securities issued by financial institutions to securities issued by non-financial corporations is economically significant for households: There is a reduction in the average nom-

inal value of the holdings of financial institutions' securities equal to 2,079 Euros (as compared to a median holding of 25,593 Euros), and an increase in the average corresponding figure for non-financial corporations equal to 913.60 Euros (as compared to a median holding of 2,237.52 Euros).

It is plausible to assume that German investors perceive German government bonds as a safe haven due to their triple-A rating. If so, we should be able to document a flight to quality from international to domestic government bonds. Such behavior would also be consistent with an increase in home bias.[10] We test this in the last column of Table 4 (Panel A). The results for regressions on the ratio of German government bonds to total bonds show that the coefficient on $Crisis_t \times Treatment_i$ is positive and significant. The magnitude of the coefficient is, however, rather small (0.003), as compared to the mean for this ratio (0.041). These results suggest that a flight to quality is accompanied by a lower level of concentration for the asset categories included in the risky share of customers' portfolios.

[Insert Table 3 here]

[Insert Table 4 here]

We acknowledge above that the level of aggregation in our dataset does not allow establishing the mechanism that drives these results. Two potential explanations for this result are increases in individual investors' risk aversion and a revision of expectations about the future distribution of returns for the average bond that is not issued by the German government relative to the average stock. The fact that stocks are typically considered to be riskier than bonds cautiously suggests that the empirical patterns we document point towards the latter hypothesis. That is, in-

10 A large body of literature (for a review, see, for example, Karolyi and Stulz (2003)) has documented that investors allocate disproportionately large fractions of their investment towards domestic securities.

vestors revise their beliefs about certain types of bonds as they shied away from particular types of bonds as a result of the reputational damage resulting from the sovereign debt crisis.[11]

5. Identification concerns and robustness tests

5.1. Identifying assumptions

Causal inference with the DiD estimator requires our setup to satisfy two key assumptions. First, treatment is exogenous with respect to the outcome, that is, the levels of portfolio concentration, we study. As we discuss in the introduction, treatment is defined as having an exposure to securities from SEZ economies above the median, and individual bank customers cannot observe other clients' portfolio choices. This fact already suggests that treatment is indeed exogenous. To provide empirical evidence, we run a probit regression with standard errors clustered on the bank level, reported in Table 5, of *Treatment* on a set of key bank characteristics. The idea is to rule out that bank characteristics correlate with selection into treatment in a systematic manner. Specifically, we use the risk-free share in clients' security portfolios (measured by the ratio of government bonds over total bonds), bank risk (measured by the natural logarithm of the Z-score[12]), the capital adequacy ratio (the sum of Tier 1 and Tier 2 capital divided by risk-weighted assets), profitability (measured by ROE), size (measured by total assets (ln)), and year-fixed effects as explanatory variables. All coefficients remain insignificant, suggesting that there are no substantial differences in the pre-treatment period between treatment and control group. As a final check, we run *t*-tests with unequal variances to compare these bank level characteristics between treatment and control group. All tests remain indistinguishable from zero.

[11] This interpretation is similar to the 'experience hypothesis' put forward by Malmendier and Nagel (2011). They argue that when investors experience negative returns on a particular asset class, they tend to shun such asset class in the future. Likewise, Bucher-Koenen and Ziegelmeyer (forthcoming) also argue that the financial crisis constitutes a traumatic experience which has potential to shape people's investment behavior.

[12] The Z-score is calculated as Tier 1 plus Tier 2 capital plus return on assets, divided by the standard deviation of return on assets over a 5-year rolling window.

[Insert Table 5 here]

Second, we examine the extent to which the evolution over time of the dependent variables for the treatment and control groups differ during the pre-treatment period. This is known as the 'parallel trends' assumption (Whited and Roberts (2012)), and it is a sufficient condition for the validity of inferences based on DiD estimation. It posits that in the absence of treatment, both treatment and control groups should evolve similarly. This identifying assumption does *not* require that the two groups be indistinguishable in the pre-treatment period in levels, because the DiD approach differences out any discrepancy between the two groups (Lemmon and Roberts (2010)). Therefore, any pre-treatment distinction between the two groups in terms of, for instance, risk aversion, does not undermine the validity of our inferences. To verify the existence of parallel trends, Figure 2 provides a visual inspection of this assumption for the pre-treatment period for all dependent variables. The graphs suggest that the parallel trend assumption holds for all dependent variables.

[Insert Figure 2 here]

Table 6 lends empirical support to the parallel trends assumption by presenting placebo regressions based on a fictitious exogenous shock in the pre-crisis period (subpanel "Placebo crisis"). For this analysis, we follow Waldinger (2010) and Bechtel and Hainmueller (2011), and run the regressions again using only the pre-crisis period and move the crisis year from 2009 to 2007. Our pre-treatment period becomes 2005-2006, and our post-treatment period becomes 2007-2008. This test helps rule out that differential trends between the treatment and control group explain our findings. Inspection of the results suggests that pre-treatment trends were similar for the two groups: β_2 is insignificant for all specifications, and in some cases it has an opposite sign from that in Table 3.

In addition, we offer an alternative test to investigate the impact of the financial crisis of 2007-2009 on our estimation. To this end, we repeat our regressions by moving the treatment period

back to the financial crisis: from Q2-2007 to Q3-2008.[13] This analysis refines our identification strategy further by using quarterly data, which is only available for the information on security holdings but not for the bank variables. If our treatment group is simply capturing stress in the financial markets, instead of the Eurozone crisis, then we should find that even the financial crisis should affect portfolio concentration. Table 6 (subpanel "Placebo crisis, quarterly") illustrates that the coefficients on *Interaction* in this exercise remain insignificant, suggesting that our treatment group is unaffected by the 2007-2009 financial crisis.

[Insert Table 6 here]

5.2. Confounding events and alternative explanations

The validity of our results rests on the assumption that we identified the timing of the Eurozone crisis correctly. The global financial crisis occurred in 2007-2009 and, in particular because of the collapse of Lehman Brothers in September 2008, this crisis could have introduced noise in our data that may influence our estimates. This test again relies on quarterly data because the higher frequency of the data helps address concerns related to the possible influence of confounding events on our estimates. We focus only on the period starting in Q1-2009 and ending in Q4-2011 (12 quarters), and consider as treatment period the quarters from Q3-2010 to Q4-2011 (six quarters), about two to three years from the collapse of Lehman Brothers. In doing so, we can be certain that any treatment effect picked up in our estimations can be ascribed to the Eurozone crisis, because it does not coincide with the period around Lehman's collapse. We choose Q3-2010 as the start quarter for the treatment period because it is immediately after Greece's request for assistance and Moody's warning of contagion risks, which occurred in the middle of Q2-2010 (April-May 2010) (Zoli (2013)). The economic magnitude of the shock is best illustrated

[13] In April 2007 (Q2-2007) New Century Financial Corporation, a leading subprime mortgage lender, files for Chapter 11 bankruptcy protection. In September 2008 (Q3-2008), Lehman Brothers files for Chapter 11 bankruptcy protection. These dates are provided by the Federal Reserve Bank of St. Louis, and are available at: http://timeline.stlouisfed.org/.

using market values: In Q2-2010 the overall market value of SEZ economies' securities in the portfolios declined by 11.93%. Using Q3-2010 instead of Q2-2010 therefore reduces the possibility of conflating the treatment and control period. However, for robustness, we also employ Q2-2010 as start of the treatment period. The results are also reported in Table 7, and are virtually the same as those reported in Table 3, irrespective of whether we choose Q2-2010 or Q3-2010 as the start of the treatment period.

[Insert Table 7 here]

The observed changes in portfolio composition may also be the result of an alternative explanation we have neglected so far. Potentially, banks' proprietary trading affects the composition of the portfolios of retail investors as documented by Fecht, Hackethal, and Karabulut (2013) and our empirical setup so far does not account for banks' own trading activities. If so, we may incorrectly ascribe the changes in portfolio composition to customers' decisions, when in fact banks are unloading underperforming securities onto their clients' portfolios.

To rule out that this is the case, we first calculate our HHI measures also for banks' portfolios, based on the same categories of securities as those for their clients. We then re-estimate our main regressions but include also the banks' HHI as a covariate. The results, reported in Table 8, are virtually identical to those reported in Table 3, and the coefficients on banks' HHI are insignificant. In a similar vein, we repeat the analysis with the components of the HHI measures, as in Panel A of Table 4. The results are reported in Table 9. Apart from the share in securities issued by domestic financial institutions and non-financial firms, the banks' holdings do not affect the clients' holdings. The magnitude, sign, and significance of the coefficients on *Interaction* remain virtually unaltered.

[Insert Table 8 here]

[Insert Table 9 here]

We present an additional test that focuses on whether the types of bank customers differ systematically across bank types which could confound our results. This test hones in on banks with intensive proprietary trading activities, defined as trading book banks in the German Banking Act.[14] The intuition is twofold: First, a number of trading book banks may have customers which are very dissimilar to the average bank customer in Germany. Second, these banks may be particularly affected by the crisis and may dispose of these underperforming securities by shifting these securities into client portfolios (see, Fecht, Karabulut, and Hackethal (2013)). To examine this matter, Table 10 presents regressions excluding trading book banks. The results are very similar to our main results.

[Insert Table 10 here]

In a similar vein, bank size may result in endogenous matching of 'average customers' to their banks. To verify that our results remain intact across size categories, we confirm our results in Tables 11 and 12 which split the sample at the median bank size in terms of total assets (419mn EUR) into small and big banks, respectively. We obtain again similar results, with the only difference being that the significance levels for the key coefficient for non-financial firms increase in the subsample for small banks.

[Insert Table 11 here]

[Insert Table 12 here]

It could be argued that the changes in our concentration measures do not take into account changes in the number of security accounts, and could therefore be driven by inflows and outflows of customers instead of changes in portfolio concentration at the customer level. The intui-

14 The German Banking Act defines a bank as a trading book institutions if i) the share of its trading book activities exceeds 5% of its total on- and off-balance sheet business, ii) its total individual trading book positions exceed the equivalent of 15 million Euro, and, iii) the share of its trading book activities exceeds 6% of its total on- and off-balance-sheet business and its total trading book positions exceed the equivalent of 20 million Euro.

tion is that the Eurozone crisis may make people shy away from capital markets. To rule out that our findings are driven by changes in the number of security accounts, we estimate model (2) after replacing our portfolio concentration measures with the number of security accounts and the (ln of the) total nominal value of all securities. The results shown in Table 13 do not support the view that changes in our concentration measures are driven by a change in the number of security accounts: The coefficients on the interaction term are insignificant for both households' and non-financial firms' portfolios.

An additional concern could be that we are not allowing for changes in other categories of financial assets, such as savings. When a client decides to open a security account, it is plausible that the funds for buying the securities are taken from her savings account. However, when we consider the ratio of total savings deposits to total assets, *Savings Ratio*, as additional bank-level control variable, the results for *Interaction* are virtually the same.

By the same token, we also test whether our results are driven by changes in the total nominal value of the securities portfolios, for which the coefficient on the interaction term is also insignificant.

[Insert Table 13 here]

5.3. Robustness tests

This section presents additional robustness tests. All tables are relegated to our Supplementary Appendix to preserve space and are available on request.

As an extension to the results reported in Table 4, we report in Table A.1 the results on the effect of the Eurozone crisis for the components of different HHI measures using market values, instead of nominal values. These results confirm the statistically and economically significant reduction in the average holding of bonds and financial institutions' securities. The increase in the share of non-financial corporations securities is also statistically significant.

In another extension, shown in Table A.2, we exploit a cross-sectional prediction by Calvet, Campbell, and Sodini (2009)). Investors with greater wealth should be less likely to adjust their portfolios in reaction to wealth shocks because the risky share in a portfolio increases when investors become richer. To this end, we split the sample at the median in terms of GDP per capita on the county level and run our regressions for rich counties (defined as those whose GDP per capita is above the median) and poor counties (defined as those whose GDP per capita is equal to or below the median). For concentration in terms of asset classes these tests confirm this prediction as the coefficients for rich counties are always smaller than for poor counties. We also confirm this finding for concentration in terms of issuers for the full sample, but for the subsamples of households and non-financial firms the coefficients are either similar or larger for poor counties. This result is driven by slightly larger concentration measures for the HHI for issuers for households and non-financial firms.

In Table A.3 we repeat the analysis of the HHI of the bank clients' portfolios controlling for the banks' HHI, whose main results are reported in Table 8, using quarterly data. Our results remain virtually unaltered, although we report a negative coefficient on the HHI measures for banks in several cases.

In Table A.4, we address the concern that our estimates may be biased by the fact that some banks operate branches in multiple counties, and therefore the variable *County Real Income Growth* is measured with error. We repeat the estimation of our main regressions on savings and cooperative banks only, for which the regional principle applies. Our main finding remains intact. In contrast to the previous regressions where we find insignificant or weakly significant coefficients for the HHI for asset classes in non-financial firms' portfolios, the coefficients now enter significantly at the five percent level. This result highlights a stark difference in the reaction to the Eurozone crisis between households and non-financial firms.

In Table A.5 we report further tests to rule out that the definition of treatment drives the inferences (first subpanel: "Alternative treatment"), and to examine the effect of different treatments of serial correlation within panels (second subpanel: "Collapsing technique").

- "Alternative treatment": We expect that the magnitude of the treatment effects should increase when the definition of *Treatment* is based on the first and last quartile of the distribution of the share of SEZ in 2009, rather than on the median: The dummy *Treatment* is now equal to one if the share of SEZ is larger than the 75th percentile of the distribution, while it is equal to 0 if the share of SEZ is smaller than the 25th percentile (all intermediate observations are discarded). If our hypothesis is correct, the magnitude of the coefficient on the interaction term *Treatment* × *Crisis* should be larger than in Table 3, because of larger differences in terms of share of SEZ in the portfolios of the treatment and control group. The results confirm our intuition.
- "Collapsing technique": A further robustness test deals with the concern that serial correlation within panels inflates the *t*-statistics on the key coefficients. We replicate the DiD tests but employ the collapsing technique proposed by Bertrand, Duflo, and Mullainathan (2004) by taking the bank-level average for each variable for the pre-treatment and post-treatment period separately, and run an OLS model on this two-period setting. This technique produces consistent standard errors. The results are virtually identical to those using clustering of the standard errors at the bank level reported in Table 3.

To rule out that our results are driven by a minority of banks in the treatment group with extraordinary high shares of SEZ we exclude observations for which the share in SEZ securities is above the 90th percentile. Results are reported in Table A.6. The results remain substantially the same as those reported in Table 3.

Finally, we offer an additional analysis to that reported in Tables 10, 11, and 12 to deal with systematic differences in customers across bank types, using Granger causality tests. The idea is to identify whether the banks' portfolio decisions Granger-cause the behavior we observe in cus-

tomer portfolios. To this end, we use quarterly data, and run regressions of the current customers' portfolio concentration measures on the first four lags of the customers' portfolio concentration measures and the first four lags of the banks' portfolio concentration measures. The results are reported in Table A.7. Importantly, our F-tests for the joint hypothesis that the coefficients for the four lags of the banks' HHIs are zero remain insignificant, suggesting that the banks' portfolio choices do not Granger-cause the customers' choices. We also test whether the effect runs in the opposite direction (that is, from the customers' portfolios to the banks' portfolios). This is not the case.

6. Conclusions

In this paper, we offer several novel insights into the literature on portfolio choice. To this end, we exploit a unique dataset that provides information about the population of all securities deposit accounts held by clients in German banks to examine whether households and non-financial firms' respond to the Eurozone crisis by changing portfolio concentration in terms of both asset classes and issuers.

A key innovation in this research is the distinction between two different types of investors: Households and non-financial firms. Clearly, the literature has devoted much effort to understanding portfolio choices of households. However, academic research on portfolio choice of non-financial firms and hypotheses about how these investors are likely to respond to a plausibly exogenous wealth shock remain virtually absent in the literature, despite the fact that these types of investors hold securities portfolios with a value of 484 billion Euros, equivalent to 18 percent of the German GDP. Our work offers an initial exploratory analysis that contrasts these two types of investors with the objective to uncover important heterogeneities between households and non-financial firms in terms of average concentration preferences and in terms of portfolio rebalancing following a massive macroeconomic shock arising at the periphery which was transmitted via financial markets to the core of the Eurozone.

We are interested in the effects of the rebalancing. Our empirical setup is based on the shock arising from the sovereign debt crisis in Europe in 2009 which is clearly exogenous from the perspective of German bank clients. Using DiD estimation to tease out the reaction to a wealth shock deriving from holding SEZ securities at the onset of the Eurozone crisis, we can directly compare the allocation preferences of households and non-financial firms and their reaction to a decline in the value of their security portfolio.

We arrive at two key findings: First, we show that the shocks deriving from the Eurozone crisis results in lower concentration, in terms of both asset class and issuer of the security, and flight to quality for households, but not for non-financial firms. Our second key finding documents that the decrease in portfolio concentration for households occurs because of a migration from bonds to equities. Because the shock we examine is plausibly exogenous with respect to portfolio choices of both households and non-financial firms, out results are robust to a battery of sensitivity checks, including tests that rely on alternative types of treatment. Placebo tests also confirm that the effects we uncover are causal in nature. Moreover, we are able to rule out alternative explanations.

Economically, these findings are also significant. With a size of 28,285 Euros for the median household portfolios in our dataset, we document that the Eurozone crisis makes households dispose of bond holdings with a volume of 1,321 Euros. Intuitively, the median household also abandons securities issued by banks with a volume of 2,079 Euros and moves into non-financial firms' securities. On the other hand, the results for non-financial firms are both statistically and economically insignificant.

A limitation of our research is the security-level setup of our dataset which renders the inclusion of client-fixed effects infeasible. To the best of our knowledge, however, this is the only available dataset for both households and non-financial firms which allows extrapolating the effect of the Eurozone crisis on security portfolios, because of the data on securities issued by SEZ

countries. Moreover, this is the only dataset comprising information on a large number of retail and corporate investors for Germany. Further research with data at the individual portfolio level related to SEZ holdings is needed to identify more precisely the channel through which the Euro-zone crisis has affected the structure of investor portfolios using individual customer-level portfolios. In particular, future studies could investigate whether the portfolio rebalancing is a response to an increase in risk aversion (Guiso et al. (2012)) or to a a revision of beliefs about future returns of different types of securities (Malmendier and Nagel (2011); Amromin and Sharpe (forthcoming)).

References

Ampudia, M., and M. Ehrmann (2014). Macroeconomic experiences and risk taking of Euro area households. Bank of Canada, Working Paper 2014–10.

Amromin, G., and S. A. Sharpe (forthcoming). From the horse's mouth: Economic conditions and investor expectations of risk and return. *Management Science*.

Angerer, X., and P. S. Lam (2009). Income risk and portfolio choice: An empirical study. *Journal of Finance* 64(2), 1037–1055.

Battistini, N., M. Pagano, and S. Simonelli (2014). Systemic risk, sovereign yields and bank exposures in the euro crisis. *Economic Policy* 29(78), 203–251.

Bhattacharya, U., A. Hackethal, S. Kaesler, B. Loos, and S. Meyer (2012). Is unbiased financial advice to retail investors sufficient? Answers from a large field study. *Review of Financial Studies* 25(4), 975–1032.

Bechtel, M. M., and J. Hainmueller (2011). How lasting is voter gratitude? An analysis of the short- and long-term electoral returns to beneficial policy. *American Journal of Political Science* 55(4), 852–868.

Becker B., and V. Ivashina (2014) Financial repression in the European sovereign debt crisis. Swedish House of Finance Research Paper No. 14-13

Bertrand, M., E. Duflo, and S. Mullainathan (2004). How much should we trust differences-in-differences estimators? *Quarterly Journal of Economics* 119(1), 249–275.

Bluethgen, R., A. Gintschel, A. Hackethal, and A. Müller (2008). Financial advice and individual investors' portfolios. *European Business School Working Paper*.

Bucciol, A. and R. Miniaci (forthcoming). Household portfolio risk. *Review of Finance.*

Bucher-Koenen, T., and M. Ziegelmeyer (forthcoming). Once burned, twice shy? Financial literacy and wealth losses during the financial crisis. *Review of Finance.*

Calvet, L. E., J. Y. Campbell, and P. Sodini (2007). Down or out: Assessing the welfare costs of household investment mistakes. *Journal of Political Economy* 115, 707–747.

Calvet, L. E., J. Y. Campbell, and P. Sodini (2009). Fight or flight? Portfolio rebalancing by individual investors. *Quarterly Journal of Economics* 124(1), 301–348.

Carroll, C. D., J. Slacalek, and K. Tokuoka (2014). The distribution of wealth and the MPC: Implications of new European data. *American Economic Review*, 104, 107–111.

Corsetti, G., K. Kuester, A. Meier, and G. J. Müller (2013). Sovereign risk, fiscal policy, and macroeconomic stability. *Economic Journal*, 123(566), F99–F132.

Deutsche Bundesbank (2007). Bankenstatistik Richtlinien und Kundensystematik.

Dorn, D., G. Huberman, and P. Sengmueller (2008). Correlated trading and returns. *Journal of Finance* 63, 885–920.

Elsas, R., and J. P. Krahnen (1998). Is relationship lending special? Evidence from credit files in Germany. *Journal of Banking and Finance* 22(10-11), 1283–1316.

Fama, E. F., and K. R. French (1989). Business conditions and expected returns on stocks and bonds. *Journal of Financial Economics* 25, 23–49.

Fecht, F., A. Hackethal, and Y. Karabulut (2013). Is proprietary trading detrimental to retail investors? Deutsche Bundesbank Discussion Paper 42/2013.

Goetzmann, W. N., and A. Kumar (2008). Equity portfolio diversification. *Review of Finance* 12, 433-463.

Gosh, A. R., J. I. Kim, E. G. Mendoza, J. D. Ostry, and M. S. Qureshi (2013). Fiscal fatigue, fiscal space and debt sustainability in advanced economies. *Economic Journal* 123(566), F4-F30.

Grammatikos, T., and R. Vermeulen (2012). Transmission of the financial and sovereign debt crises to the EMU: Stock prices, CDS spreads and exchange rates. *Journal of International Money and Finance* 31(3), 517–533.

Guiso, L., T. Jappelli, and D. Terlizzese (1996). Income risk, borrowing constraints, and portfolio choice. *American Economic Review* 86(1), 158–172.

Guiso, L., H. Herrera, and M. Morelli (2013). A cultural clash view of the EU crisis. EIEF Working Paper.

Guiso, L., P. Sapienza, and L. Zingales (2012). Time varying risk aversion. Working Paper.

Haliassos, M., and C. Bertaut (1995). Why do so few hold stocks? *Economic Journal* 105, 1110–1129.

Hildebrand, T., J. Rocholl, and A. Schulz (2012). Flight to where? Evidence from bank investments during the Financial Crisis. Working paper.

Hoechle, D., S. Ruenzi, N. Schaub, and M. Schmid (2013). Don't answer the phone – financial advice and invdividual investor's performance. Working paper.

Ivković, Z., C. Sialm, and S. Weisbenner (2008). Portfolio Concentration and the Performance of Individual Investors. *Journal of Financial and Quantitative Analysis* 43(3), 613–656.

Kacperczyk, M., C. Sialm, and L. Zheng (2005). On the industry concentration of actively managed equity mutual funds. *Journal of Finance* 60, 1983–2012.

Karolyi, A., and R. Stulz (2003). Are assets priced locally or globally?, in G. Constantinides, M. Harris and R. Stulz, eds.: The Handbook of the Economics of Finance, North-Holland Publishers, New York, NY.

Kelly, M. (1995). All their eggs in one basket: Portfolio diversification of U.S. households. *Journal of Economic Behavior and Organization* 27, 87–96.

Lane, P. R. (2012). The European sovereign debt crisis. *Journal of Economic Perspectives* 26(3), 49–67.

Leahy, J. V., and J. Zeira (2005). The timing of purchases and aggregate fluctuations. *Review of Economic Studies* 72(4), 1127–1151.

Lemmon, M., and M. R. Roberts (2010). The Response of Corporate Financing and Investment to Changes in the Supply of Credit. *Journal of Financial and Quantitative Analysis* 45(3), 555–587.

Levy, H., and M. Sarnat (1970). International diversification of investment portfolios. *American Economic Review* 60(4), 668–675.

Malmendier, U., and S. Nagel (2011). Depression babies: Do macroeconomic experiences affect risk taking? *Quarterly Journal of Economics* 126(1), 373–416.

Markowitz, H. (1952). Portfolio Selection. *Journal of Finance* 7(1), 77–99.

Markowitz, H. (1959). Portfolio selection: Efficiency diversification of investments. *Cowles Foundation, Monograph n.16, New York, John Wiley & Sons, Inc.*

Mody, A., and D. Sandri (2012). The Eurozone crisis: how banks and sovereigns came to be joined at the hip. *Economic Policy* 27(70), 199–230.

Mullainathan, S., M. Nöth, and A. Schoar (2010). The market for financial advice: An audit study. *National Bureau of Economic Research Working Paper*, No. 17929.

Paravisini, D. (2008). Local bank financial constraints and firm access to external finance. *Journal of Finance* 63(5), 2161–2193.

Polkovnichenko, V. (2005). Household portfolio diversification: A case for rank-dependent preferences. *Review of Financial Studies* 18, 1467–1502.

Waldinger, F. (2010). Quality matters: The expulsion of professors and the consequences for PhD student outcomes in Nazi Germany. *Journal of Political Economy* 118(4), 787–831.

Whited, T., and M. R. Roberts (2012). Endogeneity in empirical corporate finance. in George M. Constantinides, Milton Harris, and Rene M. Stulz, eds. Handbook of the Economics of Finance, Volume 2. Amsterdam: Elsevier (2012), 493–572.

Zoli, E. (2013). Italian sovereign spreads: Their determinants and pass-through to bank funding costs and lending conditions. *International Monetary Fund, Working paper 13/84.*

Table 1: Representativeness – Germany and other selected countries.

	Germany	France	Italy	Japan	Spain	UK	USA
Household total financial assets *(% of GDP in 2011)*	180	200	230	320	160	280	330
Total financial assets of households per capita *(US dollars at current PPPs in 2010)*	70,389	70,835	76,408	105,265	53,023	104,905	159,854
Financial assets of households by type of assets *(% of total assets in 2010)*							
1. Currency and deposits	40.0	28.6	30.0	54.3	49.0	28.2	13.7
2. Securities other than shares	5.5	1.6	18.8	2.6	2.9	1.4	10.8
3. Money owed to households	0.0	0.7	0.4	0.0	0.0	0.4	1.6
4. Shares and other equity	18.8	24.5	29.7	10.8	28.9	15.3	43.4
5. Insurance technical reserves	35.0	37.3	18.2	28.0	15.4	51.7	30.4
6. Other Accounts	0.8	7.3	2.8	4.3	3.7	3.0	0.0

Table 2: Descriptive statistics for HHI measures and related components, and for the number of security accounts.

PANEL A: Components of HHI Asset class and HHI Issuer	**Nominal Values**			**Market Values**		
	Observations	**Mean**	**Standard Deviation**	**Observations**	**Mean**	**Standard Deviation**
Bonds Share	13,966	0.894	0.137	13,966	0.590	0.204
Stocks Share	13,966	0.102	0.129	13,966	0.396	0.203
Mutual funds Share	13,966	0.003	0.051	13,966	0.014	0.057
Foreign (non-SEZ) Government Share	13,966	0.043	0.051	13,966	0.025	0.031
Foreign (non-SEZ) Non-Financial Corporations Share	13,966	0.076	0.080	13,966	0.213	0.107
Foreign (non-SEZ)Financial-Institutions Share	13,966	0.411	0.086	13,966	0.297	0.102
German Government Share	13,966	0.028	0.041	13,966	0.018	0.027
German Non-Financial Corporations Share	13,966	0.054	0.061	13,966	0.169	0.090
German Financial-Institutions Share	13,966	0.384	0.093	13,966	0.274	0.102
SEZ Government Share	13,966	0.001	0.007	13,966	0.001	0.006
SEZ Non-Financial Corporations Share	13,966	0.001	0.003	13,966	0.002	0.003
SEZ Financial-Institutions Share	13,966	0.001	0.012	13,966	0.002	0.010

PANEL B: Different types of HHI	**Nominal Values**					**Market Values**				
	Full sample		**Households**	**Firms**		**Full sample**		**Households**	**Firms**	
	Mean	**S.D.**	**Mean**	**Mean**	**t-test**	**Mean**	**S.D.**	**Mean**	**Mean**	**t-test**
HHI Asset Class	0.849	0.118	0.850	0.723	38.74***	0.592	0.113	0.586	0.633	-15.131***
HHI Issuer	0.358	0.078	0.360	0.342	9.67***	0.280	0.058	0.279	0.324	-25.49***
Observations	13,966		13,966	13,966		13,966		13,966	13,966	
Banks	2,138		2,138	2,138		2,138		2,138	2,138	

PANEL C: Statistics on security accounts (all values are reported in Euros)	**Nominal Values**			**Market Values**		
	Full sample	**Households**	**Firms**	**Full sample**	**Households**	**Firms**
Total portfolio value (median)	31,661	30, 389	85,572	45,107	43,488	126,504
Observations	13,966	13,966	13,966	13,966	13,966	13,966
Bonds	29,389	28,285	66,086	28,860	27,774	64,689
Observations	13,966	13,966	13,966	13,966	13,966	13,966
Stocks	1,783	1,703	1,668	15,656	15,184	13,585
Observations	13,966	13,966	13,966	13,966	13,966	13,966

	25th percentile	**Median**	**75th percentile**
Number of accounts per bank: Households	563	1,574	3,738
Observations	13,966	13,966	13,966
Number of accounts per bank: Firms	1	6	19
Observations	13,966	13,966	13,966

*** Denotes significance at the 1% level.

Table 3. Effect of the Eurozone crisis on portfolio concentration.

This table presents estimations of model (2) with standard errors clustered at the bank level to examine how the Eurozone crisis affects portfolio concentration, measured by HHIs, in terms of asset classes (Panel A) and issuers (Panel B). *Crisis* is a dummy variable that takes on the value one for the 2009-2012 period, and zero otherwise. *Treatment* is a dummy variable equal to one if in 2009 the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. The effect of the European sovereign debt crisis is assessed by examining the impact of *Interaction = Crisis × Treatment. Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Panel A: HHI-Asset Class			Panel B: HHI-Issuer		
SUBPANEL: With Year FE	Full sample	Households	Firms	Full sample	Households	Firms
Crisis	-0.035***	-0.033***	-0.015	-0.009***	-0.007***	-0.020***
	(-12.847)	(-12.272)	(-1.367)	(-4.841)	(-3.682)	(-2.964)
Interaction	**-0.013*** **	**-0.014*** **	**0.019**	**-0.014*** **	**-0.014*** **	**0.012***
	(-3.921)	**(-4.276)**	**(1.640)**	**(-6.196)**	**(-6.153)**	**(1.696)**
Fee Income Share	0.001***	0.001**	0.001	0.000	-0.000	0.001
	(3.769)	(2.512)	(1.219)	(1.197)	(-0.108)	(0.860)
County Real Income Growth	0.000	0.000	0.000	-0.000***	-0.000**	0.000
	(0.271)	(0.233)	(0.175)	(-2.705)	(-2.453)	(0.408)
Constant	0.842***	0.848***	0.702***	0.354***	0.361***	0.338***
	(150.174)	(130.435)	(43.374)	(79.890)	(71.885)	(32.754)
Year FE	YES	YES	YES	YES	YES	YES
Observations	13,647	13,647	13,647	13,647	13,647	13,647
Banks	2,118	2,118	2,118	2,118	2,118	2,118
R-squared	0.335	0.341	0.008	0.215	0.206	0.005
Bank FE	YES	YES	YES	YES	YES	YES
SUBPANEL: With Yield Curve Spread	Full sample	Households	Firms	Full sample	Households	Firms
Crisis	-0.076***	-0.073***	-0.042***	-0.026***	-0.024***	-0.026***
	(-22.319)	(-22.511)	(-3.768)	(-11.387)	(-10.308)	(-3.806)
Interaction	**-0.013*** **	**-0.014*** **	**0.019***	**-0.014*** **	**-0.014*** **	**0.013***
	(-3.755)	**(-4.098)**	**(1.658)**	**(-6.030)**	**(-5.974)**	**(1.709)**
Fee Income Share	0.001*	0.000	0.001	-0.000	-0.001**	0.000
	(1.688)	(0.574)	(0.795)	(-0.957)	(-2.207)	(0.653)
County Real Income Growth	-0.001***	-0.001***	-0.000	-0.001***	-0.001***	-0.000
	(-6.961)	(-7.278)	(-0.044)	(-13.015)	(-13.375)	(-0.030)
Yield Curve Spread	0.017***	0.017***	0.005	0.005***	0.004***	0.004
	(12.566)	(12.302)	(1.025)	(5.346)	(4.005)	(1.141)
Constant	0.862***	0.870***	0.722***	0.374***	0.382***	0.342***
	(166.720)	(143.063)	(45.963)	(92.970)	(82.643)	(34.308)
Year FE	NO	NO	NO	NO	NO	NO
Observations	13,647	13,647	13,647	13,647	13,647	13,647
Banks	2,118	2,118	2,118	2,118	2,118	2,118
R-squared	0.275	0.278	0.005	0.152	0.140	0.004
Bank FE	YES	YES	YES	YES	YES	YES

Table 4. Results on the effect of the Eurozone crisis for the components of different HHI measures.

This table presents estimations of model (2) with standard errors clustered at the bank level to establish how the Eurozone crisis affects the share of different components of the HHI. *Crisis* is a dummy variable that takes on the value one for the 2009-2012 period, and zero otherwise. *Treatment* is a dummy variable equal to one if in 2009 the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. The effect of the European sovereign debt crisis is assessed by examining the impact of *Interaction = Crisis × Treatment*. *Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. The variables in Panel A are defined as nominal value for that asset category over the total nominal value of the portfolio at the bank level, except for German Government Bonds Share, which is calculated as the nominal value of German Government Bonds over the total nominal value of bonds in the portfolio. FI = financial institutions (both shares and bonds); NF = non-financial corporations (both shares and bonds); Gov. = government bonds; Foreign = foreign countries other than SEZ. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

PANEL A (Full sample)	Bonds Share	Stocks Share	Mutual Funds Share	German FI Share	German NF Share	Foreign FI Share	Foreign NF Share	German Gov. Bonds Share
Crisis	-0.025***	0.025***	-0.000	-0.005***	0.016***	-0.012***	0.018***	-0.006***
	(-9.538)	(9.654)	(-0.310)	(-2.701)	(11.879)	(-6.182)	(10.820)	(-5.138)
Interaction	**-0.019*** **	**0.019*** **	**0.001**	**-0.019*** **	**0.013*** **	**-0.019*** **	**0.016*** **	**0.003** **
	(-5.015)	**(4.879)**	**(1.069)**	**(-7.326)**	**(7.843)**	**(-7.898)**	**(6.869)**	**(2.010)**
Fee Income Share	0.002***	-0.001***	-0.000	-0.000	0.000	-0.000	0.000	0.000
	(2.822)	(-2.711)	(-0.749)	(-0.458)	(0.109)	(-0.983)	(0.317)	(0.567)
County Real Income Growth	0.000	-0.000	-0.000	-0.000	0.000	-0.000**	0.000	0.000**
	(1.641)	(-1.333)	(-0.805)	(-1.486)	(0.328)	(-2.287)	(0.813)	(2.076)
Constant	0.885***	0.111***	0.005**	0.390***	0.043***	0.424***	0.060***	0.036***
	(103.690)	(13.236)	(2.340)	(75.888)	(15.746)	(80.089)	(14.874)	(9.328)
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	13,647	13,647	13,647	13,647	13,647	13,647	13,647	13,647
Banks	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118
R-squared	0.207	0.216	0.001	0.235	0.303	0.177	0.259	0.026
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES

PANEL B (Households)	Bonds Share	Bonds (Euros)	Stocks Share	Stocks (Euros)	FI Share	FI (Euros)	NF Share	NF (Euros)
Crisis	-0.023***	5,132***	0.024***	979.49***	-0.013***	4,749***	0.032***	1,338***
	(-9.357)	(12.358)	(9.928)	(17.909)	(-3.919)	(12.757)	(12.477)	(14.316)
Interaction	**-0.022*** **	**-1,321*** **	**0.022*** **	**235.6*** **	**-0.040*** **	**-2,079*** **	**0.034*** **	**913.6*** **
	(-5.769)	**(-2.670)**	**(5.855)**	**(3.063)**	**(-8.563)**	**(-4.335)**	**(8.911)**	**(6.589)**
Fee Income Share	0.002***	13.022	-0.002***	-24.491	-0.001	0.250	-0.000	52.114
	(2.939)	(0.090)	(-3.158)	(-1.579)	(-0.901)	(0.002)	(-0.959)	(1.354)
County Real Income Growth	0.000	-46.031**	-0.000	-2.022	-0.000**	-58.979***	0.000	6.493
	(1.323)	(-2.509)	(-0.937)	(-0.668)	(-2.021)	(-3.306)	(1.193)	(1.234)
Constant	0.884***	26,162***	0.113***	2,033***	0.817***	23,286***	0.109***	1,616***
	(97.063)	(12.131)	(11.888)	(8.531)	(86.716)	(14.043)	(14.710)	(2.790)
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	13,647	13,647	13,647	13,647	13,647	13,647	13,647	13,647
Banks	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118
R-squared	0.211	0.170	0.221	0.239	0.233	0.198	0.313	0.205
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES

Table 5. Pre-treatment differences between treatment and control group.

This table presents a probit regression to verify that treatment is not a function of bank characteristics in terms of the risk-free share of clients' portfolios, bank risk-taking, bank capital adequacy ratio, bank profitability, and bank size. This regression also includes year-fixed effects. The dependent variable takes on the value of one if the bank belongs to the treatment group or zero otherwise. We also present the means for the treatment and control group for these variables and present a t-test. Robust z-statistics in parentheses (clustered at the bank level). Constant term included but not shown.

Dependent variable:	Probit regression	Mean control	Mean treatment	Difference	t-statistic
Treatment		group (A)	group (B)	(A – B)	
German Gov. Bonds Share	0.254	0.03403	0.03499	-0.00096	-0.8463
	(0.425)	(0.00085)	(0.00075)	(0.00113)	
Ln(Z-score)	-0.021	3.50171	3.48260	0.01911	1.1484
	(-0.512)	(0.01129)	(0.01223)	(0.01664)	
Capital adequacy ratio	0.000	16.33443	16.74098	-0.40655	-1.1895
	(0.165)	(0.12951)	(0.31628)	(0.34178)	
Return on equity	-0.004	9.77156	9.58807	0.18348	0.3940
	(-1.557)	(0.42206)	(0.19682)	(0.46570)	
Ln (Total assets)	0.000	4.18e+09	3.96e+09	2.17e+08	0.1916
	(0.276)	(8.04e+08)	(7.95e+08)	(1.13e+09)	
Year FE	YES				
Observations	6,536				

Table 6. Effect of the Eurozone crisis on portfolio concentration: Placebo tests for the parallel trends assumption.

This table presents tests for the validity of the parallel trends assumption. For the subpanel *Placebo crisis*, we run model (2) for the pre-treatment period only, using 2005-2006 (2007-2008) as the pre-treatment (post-treatment) period instead of 2005-2008 and 2009-2012. In other words, we create a placebo sovereign debt crisis for 2007-2008. The effect of the placebo sovereign debt crisis is assessed by examining the impact of *Placebo Interaction = Placebo Crisis × Treatment*. For the subpanel "Placebo crisis, quarterly", we run model (2) using quarterly data for the period from Q4-2005 to Q3-2008. *Treatment* is a dummy variable equal to one if in Q2-2007 the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. *Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.*** p<0.01, ** p<0.05, * p<0.1.

SUBPANEL: Placebo crisis	Panel A: HHI-Asset Class			Panel B: HHI-Issuer		
	Full sample	Households	Firms	Full sample	Households	Firms
Crisis	0.021***	0.021***	0.009	0.020***	0.021***	-0.001
	(10.960)	(10.462)	(0.896)	(14.459)	(15.688)	(-0.156)
Placebo Interaction	**0.001**	**0.003**	**0.017**	**-0.003**	**-0.002**	**0.010**
	(0.396)	**(1.206)**	**(1.510)**	**(-1.571)**	**(-1.325)**	**(1.390)**
Fee Income Share	0.000	-0.000	0.001	0.002***	0.001	0.002
	(0.654)	(-0.236)	(0.800)	(3.742)	(1.320)	(1.243)
County Real Income Growth	-0.000	-0.000	0.002**	-0.000*	-0.000	0.001
	(-1.430)	(-1.503)	(2.357)	(-1.677)	(-1.369)	(1.555)
Constant	0.856***	0.867***	0.694***	0.337***	0.351***	0.321***
	(85.977)	(65.388)	(24.814)	(56.754)	(48.984)	(17.527)
Year FE	YES	YES	YES	YES	YES	YES
Observations	7,114	7,114	7,114	7,114	7,114	7,114
R-squared	0.104	0.111	0.005	0.140	0.157	0.002
Bank FE	YES	YES	YES	YES	YES	YES
SUBPANEL: Placebo crisis, quarterly	Full sample	Households	Firms	Full sample	Households	Firms
Crisis	0.032***	0.033***	0.006	0.024***	0.026***	-0.003
	(9.465)	(9.588)	(0.689)	(13.361)	(14.632)	(-0.529)
Placebo Interaction	**0.001**	**0.002**	**-0.005**	**-0.002**	**-0.001**	**-0.001**
	(0.148)	**(0.470)**	**(-0.456)**	**(-0.863)**	**(-0.648)**	**(-0.232)**
Fee Income Share	-0.001	-0.001	0.002	0.001	0.000	0.001
	(-0.461)	(-0.705)	(1.370)	(1.083)	(0.197)	(1.433)
County Real Income Growth	-0.001**	-0.001**	0.001	-0.000*	-0.000	0.000
	(-2.509)	(-2.340)	(0.914)	(-1.741)	(-1.364)	(1.000)
Constant	0.863***	0.869***	0.681***	0.344***	0.354***	0.319***
	(43.556)	(44.544)	(29.764)	(30.952)	(36.762)	(20.325)
Quarter FE	YES	YES	YES	YES	YES	YES
Observations	21,462	21,462	21,462	21,462	21,462	21,462
Banks	1,988	1,988	1,988	1,988	1,988	1,988
R-squared	0.031	0.034	0.004	0.070	0.079	0.004
Bank FE	YES	YES	YES	YES	YES	YES

Table 7. Effect of the Eurozone crisis on portfolio concentration: Quarterly data.

The table presents regressions of model (2) with standard errors clustered at the bank level to examine the effect of the Eurozone crisis on portfolio concentration, measured by asset classes (Panel A), and issuers (Panel B) using quarterly data. *Crisis* is a dummy variable that takes on the value one for the period from Q3-2010 (or Q2-2010) to Q4-2011, and zero otherwise. *Treatment* is a dummy variable equal to one if in Q3-2010 (or Q2-2010) the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. The effect of the European sovereign debt crisis is assessed by examining the impact of *Interaction = Crisis × Treatment*. *Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Panel A: HHI-Asset Class			Panel B: HHI-Issuer		
SUBPANEL: *Q3-2010 start of treatment period*	Full sample	Households	Firms	Full sample	Households	Firms
Crisis	-0.024***	-0.028***	-0.001	-0.017***	-0.019***	-0.004
	(-4.999)	(-6.228)	(-0.051)	(-7.163)	(-8.356)	(-0.562)
Interaction	**-0.008****	**-0.006****	**-0.000**	**-0.010*****	**-0.009*****	**-0.006**
	(-2.370)	**(-1.998)**	**(-0.031)**	**(-5.560)**	**(-4.871)**	**(-0.988)**
Fee Income Share	0.002	0.001	0.000	0.001	0.001	0.000
	(1.228)	(1.207)	(0.233)	(1.396)	(1.462)	(0.403)
County Real Income Growth	-0.001***	-0.000**	-0.001	-0.001***	-0.000***	-0.000
	(-2.612)	(-2.410)	(-1.410)	(-4.134)	(-3.859)	(-0.669)
Constant	0.804***	0.814***	0.690***	0.344***	0.350***	0.328***
	(36.452)	(48.529)	(30.088)	(30.839)	(40.127)	(23.840)
Quarter FE	YES	YES	YES	YES	YES	YES
Observations	20,100	20,100	20,100	20,100	20,100	20,100
Banks	1,755	1,755	1,755	1,755	1,755	1,755
R-squared	0.070	0.096	0.003	0.114	0.123	0.003
Bank FE	YES	YES	YES	YES	YES	YES
SUBPANEL: *Q2-2010 start of treatment period*	Full sample	Households	Firms	Full sample	Households	Firms
Crisis	-0.025***	-0.027***	-0.002	-0.018***	-0.019***	-0.002
	(-5.118)	(-6.191)	(-0.207)	(-7.355)	(-8.333)	(-0.341)
Interaction	**-0.007****	**-0.006****	**0.003**	**-0.010*****	**-0.009*****	**-0.008**
	(-1.983)	**(-2.028)**	**(0.321)**	**(-4.998)**	**(-4.566)**	**(-1.437)**
Fee Income Share	0.002	0.001	0.000	0.001	0.001	0.000
	(1.226)	(1.210)	(0.225)	(1.396)	(1.465)	(0.418)
County Real Income Growth	-0.001***	-0.000**	-0.001	-0.001***	-0.000***	-0.000
	(-2.599)	(-2.395)	(-1.414)	(-4.092)	(-3.819)	(-0.658)
Constant	0.804***	0.814***	0.690***	0.344***	0.350***	0.328***
	(36.426)	(48.505)	(30.103)	(30.784)	(40.083)	(23.807)
Quarter FE	YES	YES	YES	YES	YES	YES
Observations	20,100	20,100	20,100	20,100	20,100	20,100
Banks	1,755	1,755	1,755	1,755	1,755	1,755
R-squared	0.070	0.096	0.003	0.113	0.123	0.003
Bank FE	YES	YES	YES	YES	YES	YES

Table 8. Effect of the Eurozone crisis on portfolio concentration after controlling for banks' HHI.

This table presents estimations of model (2) with standard errors clustered at the bank level to establish the effect of the Eurozone crisis on portfolio concentration in terms of asset classes (Panel A) and issuers (Panel B). Unlike the main regressions, these tests additionally control for the banks' own portfolio holdings. *Crisis* is a dummy variable that takes on the value one for the 2009-2012 period, and zero otherwise. *Treatment* is a dummy variable equal to one if in 2009 the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. The effect of the European sovereign debt crisis is assessed by examining the impact of *Interaction = Crisis × Treatment*. *Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Panel A: HHI-Asset Class			Panel B: HHI-Issuer		
SUBPANEL: With Year FE	Full sample	Households	Firms	Full sample	Households	Firms
Crisis	-0.035***	-0.033***	-0.015	-0.009***	-0.007***	-0.020***
	(-12.880)	(-12.341)	(-1.396)	(-4.849)	(-3.690)	(-2.968)
Interaction	**-0.013*** **	**-0.014*** **	**0.019**	**-0.014*** **	**-0.014*** **	**0.012***
	(-3.925)	**(-4.278)**	**(1.644)**	**(-6.197)**	**(-6.153)**	**(1.694)**
HHI-Asset class (Banks)	0.006	-0.001	-0.048			
	(0.375)	(-0.086)	(-1.243)			
HHI-Issuer (Banks)				-0.003	-0.003	-0.008
				(-1.021)	(-1.039)	(-1.019)
Fee Income Share	0.001***	0.001**	0.001	0.000	-0.000	0.001
	(3.736)	(2.504)	(1.207)	(1.186)	(-0.116)	(0.849)
County Real Income Growth	0.000	0.000	0.000	-0.000***	-0.000**	0.000
	(0.260)	(0.235)	(0.195)	(-2.686)	(-2.434)	(0.419)
Constant	0.836***	0.849***	0.750***	0.356***	0.362***	0.341***
	(48.073)	(52.988)	(18.952)	(75.378)	(68.806)	(31.809)
Year FE	YES	YES	YES	YES	YES	YES
Observations	13,647	13,647	13,647	13,647	13,647	13,647
Banks	2,118	2,118	2,118	2,118	2,118	2,118
R-squared	0.335	0.341	0.008	0.215	0.206	0.005
Bank FE	YES	YES	YES	YES	YES	YES
SUBPANEL: With Yield Curve Spread	Full sample	Households	Firms	Full sample	Households	Firms
Crisis	-0.076***	-0.073***	-0.042***	-0.026***	-0.024***	-0.026***
	(-22.316)	(-22.541)	(-3.774)	(-11.419)	(-10.342)	(-3.819)
Interaction	**-0.013*** **	**-0.014*** **	**0.019***	**-0.014*** **	**-0.014*** **	**0.013***
	(-3.756)	**(-4.097)**	**(1.663)**	**(-6.030)**	**(-5.974)**	**(1.707)**
HHI-Asset class (Banks)	0.001	-0.006	-0.051			
	(0.071)	(-0.492)	(-1.322)			
HHI-Issuer (Banks)				-0.002	-0.002	-0.007
				(-0.746)	(-0.713)	(-1.007)
Fee Income Share	0.001*	0.000	0.001	-0.000	-0.001**	0.000
	(1.683)	(0.570)	(0.782)	(-0.966)	(-2.213)	(0.636)
County Real Income Growth	-0.001***	-0.001***	-0.000	-0.001***	-0.001***	-0.000
	(-6.949)	(-7.267)	(-0.025)	(-13.023)	(-13.385)	(-0.033)
Yield Curve Spread	0.017***	0.017***	0.005	0.005***	0.004***	0.004
	(12.560)	(12.267)	(0.994)	(5.369)	(4.030)	(1.166)
Constant	0.861***	0.876***	0.773***	0.375***	0.383***	0.345***
	(53.931)	(60.616)	(19.436)	(88.028)	(79.019)	(33.217)
Year FE	YES	YES	YES	YES	YES	YES
Observations	13,647	13,647	13,647	13,647	13,647	13,647
Banks	2,118	2,118	2,118	2,118	2,118	2,118
R-squared	0.275	0.278	0.005	0.152	0.140	0.004
Bank FE	YES	YES	YES	YES	YES	YES

Table 9. Results on the effect of the Eurozone crisis for the components of different HHI measures after controlling for banks' corresponding holding.

This table focuses on the effect of the Eurozone crisis on the components of the HHI after controlling for the banks' own portfolio holdings. We run model (2) with standard errors clustered at the bank level. *Crisis* is a dummy variable that takes on the value one for the 2009-2012 period, and zero otherwise. *Treatment* is a dummy variable equal to one if in 2009 the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. The effect of the European sovereign debt crisis is assessed by examining the impact of *Interaction = Crisis × Treatment*. *Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Bonds Share	Stocks Share	Mutual Funds Share	German FI Share	German NF Share	Foreign FI Share	Foreign NF Share	German Gov. Bonds Share
Crisis	-0.025***	0.025***	-0.000	-0.004**	0.016***	-0.011***	0.018***	-0.006***
	(-9.534)	(9.617)	(-0.309)	(-1.999)	(11.886)	(-5.724)	(10.826)	(-5.149)
Interaction	**-0.019*** **	**0.019*** **	**0.001**	**-0.018*** **	**0.014*** **	**-0.019*** **	**0.016*** **	**0.003** **
	(-5.014)	**(4.900)**	**(1.069)**	**(-7.335)**	**(7.895)**	**(-7.918)**	**(6.866)**	**(2.019)**
Bonds Share (Banks)	0.002							
	(0.128)							
Stocks Share (Banks)		0.051						
		(1.168)						
Mutual Funds Share (Banks)			0.001					
			(1.344)					
German FI Share (Banks)				0.041***				
				(2.693)				
German NF Share (Banks)					0.053**			
					(2.125)			
Foreign FI Share (Banks)						-0.023*		
						(-1.710)		
Foreign NF Share (Banks)							0.006	
							(0.411)	
German Gov. Bonds Share (Banks)								-0.001
								(-0.111)
Fee Income Share	0.002***	-0.001***	-0.000	-0.000	0.000	-0.000	0.000	0.000
	(2.818)	(-2.732)	(-0.749)	(-0.648)	(0.158)	(-1.072)	(0.331)	(0.563)
County Real Income Growth	0.000	-0.000	-0.000	-0.000	0.000	-0.000**	0.000	0.000**
	(1.640)	(-1.316)	(-0.805)	(-1.403)	(0.336)	(-2.250)	(0.809)	(2.074)
Constant	0.882***	0.111***	0.005**	0.374***	0.043***	0.435***	0.060***	0.036***
	(42.438)	(13.226)	(2.339)	(43.333)	(15.628)	(48.070)	(14.725)	(9.528)
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	13,647	13,647	13,647	13,647	13,647	13,647	13,647	13,647
Banks	2,118	2,118	2,118	2,118	2,118	2,118	2,118	2,118
R-squared	0.207	0.216	0.001	0.238	0.303	0.178	0.259	0.026
Bank FE	YES	YES	YES	YES	YES	YES	YES	YES

Table 10. Regression for non-trading book banks.

This table presents tests for the effect of the Eurozone crisis on portfolio diversification in terms of asset classes (Panel A) and issuers (Panel B). Unlike the main tests presented in Table 3, we exclude trading book banks. *Crisis* is a dummy variable that takes on the value one for the 2009-2012 period, and zero otherwise. *Treatment* is a dummy variable equal to one if in 2009 the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. The effect of the European sovereign debt crisis is assessed by examining the impact of *Interaction = Crisis × Treatment*. *Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Panel A: HHI-Asset Class			Panel B: HHI-Issuer		
SUBPANEL: With Year FE	Full Sample	Households	Firms	Full Sample	Households	Firms
Crisis	-0.035***	-0.033***	-0.016	-0.008***	-0.006***	-0.018***
	(-12.411)	(-11.923)	(-1.396)	(-3.905)	(-3.206)	(-2.584)
Interaction	**-0.015*** **	**-0.016*** **	**0.024***	**-0.014*** **	**-0.014*** **	**0.016****
	(-4.117)	**(-4.484)**	**(1.927)**	**(-5.650)**	**(-5.788)**	**(1.997)**
Fee Income Share	0.001***	0.001***	0.001	0.000	0.000	0.000
	(2.818)	(2.611)	(0.607)	(1.013)	(0.676)	(0.465)
County Real Income Growth	0.000	0.000	-0.000	-0.000	-0.000	0.000
	(0.846)	(0.675)	(-0.013)	(-1.530)	(-1.601)	(0.433)
Constant	0.845***	0.847***	0.703***	0.354***	0.356***	0.341***
	(118.750)	(112.829)	(32.882)	(62.334)	(60.543)	(26.199)
Year FE	YES	YES	YES	YES	YES	YES
Observations	12,251	12,251	12,251	12,251	12,251	12,251
Banks	1,922	1,922	1,922	1,922	1,922	1,922
R-squared	0.352	0.371	0.007	0.220	0.226	0.004
Bank FE	YES	YES	YES	YES	YES	YES
SUBPANEL: With Yield Curve Spread	Full Sample	Households	Firms	Full Sample	Households	Firms
Crisis	-0.076***	-0.076***	-0.041***	-0.026***	-0.025***	-0.026***
	(-22.319)	(-21.940)	(-3.487)	(-10.489)	(-10.107)	(-3.478)
Interaction	**-0.013*** **	**-0.016*** **	**0.024***	**-0.014*** **	**-0.014*** **	**0.016****
	(-3.755)	**(-4.419)**	**(1.929)**	**(-5.578)**	**(-5.714)**	**(2.002)**
Fee Income Share	0.001*	0.000	0.000	-0.000	-0.000	0.000
	(1.688)	(0.896)	(0.310)	(-0.957)	(-1.375)	(0.270)
County Real Income Growth	-0.001***	-0.001***	-0.000	-0.001***	-0.001***	0.000
	(-6.961)	(-7.028)	(-0.344)	(-12.414)	(-12.876)	(0.153)
Yield Curve Spread	0.017***	0.018***	0.004	0.005***	0.005***	0.004
	(12.566)	(12.678)	(0.680)	(4.822)	(4.655)	(0.975)
Constant	0.862***	0.869***	0.724***	0.376***	0.380***	0.346***
	(166.720)	(127.003)	(34.373)	(75.400)	(74.362)	(27.091)
Year FE	NO	NO	NO	NO	NO	NO
Observations	13,647	12,251	12,251	12,251	12,251	12,251
Banks	2,118	1,922	1,922	1,922	1,922	1,922
R-squared	0.275	0.302	0.005	0.146	0.146	0.004
Bank FE	YES	YES	YES	YES	YES	YES

Table 11. Regression for big banks

This table presents tests for the effect of the Eurozone crisis on portfolio diversification in terms of asset classes (Panel A) and issuers (Panel B). We repeat the estimations of model (2) with standard errors clustered at the bank level like in Table 3 but the sample is constrained to big banks, defined as banks whose total assets are above the asset size of the median bank. *Crisis* is a dummy variable that takes on the value one for the 2009-2012 period, and zero otherwise. *Treatment* is a dummy variable equal to one if in 2009 the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. The effect of the European sovereign debt crisis is assessed by examining the impact of *Interaction = Crisis × Treatment. Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Panel A: HHI-Asset Class			Panel B: HHI-Issuer		
SUBPANEL: With Year FE	Full Sample	Households	Firms	Full Sample	Households	Firms
Crisis	-0.029***	-0.024***	-0.029***	-0.015***	-0.011***	-0.033***
	(-8.841)	(-8.585)	(-3.076)	(-5.612)	(-4.280)	(-5.208)
Interaction	**-0.011*** **	**-0.013*** **	**0.003**	**-0.013*** **	**-0.014*** **	**-0.001**
	(-2.685)	**(-3.653)**	**(0.315)**	**(-4.210)**	**(-4.249)**	**(-0.151)**
Fee Income Share	0.002***	0.001*	0.003**	0.000	-0.000	0.001*
	(3.749)	(1.920)	(2.082)	(1.029)	(-0.295)	(1.736)
County Real Income Growth	-0.000*	-0.000**	0.000	-0.000***	-0.000***	-0.000
	(-1.811)	(-2.315)	(0.861)	(-3.299)	(-3.122)	(-0.376)
Constant	0.853***	0.865***	0.799***	0.368***	0.377***	0.369***
	(132.736)	(100.124)	(44.238)	(72.527)	(54.187)	(33.057)
Year FE	YES	YES	YES	YES	YES	YES
Observations	6,887	6,887	6,887	6,887	6,887	6,887
Banks	1,098	1,098	1,098	1,098	1,098	1,098
R-squared	0.321	0.331	0.017	0.243	0.211	0.020
Bank FE	YES	YES	YES	YES	YES	YES
SUBPANEL: With Yield Curve Spread	Full Sample	Households	Firms	Full Sample	Households	Firms
Crisis	-0.062***	-0.056***	-0.043***	-0.027***	-0.023***	-0.034***
	(-15.054)	(-16.206)	(-4.113)	(-8.466)	(-7.230)	(-4.853)
Interaction	**-0.010** **	**-0.013*** **	**0.003**	**-0.013*** **	**-0.013*** **	**-0.001**
	(-2.548)	**(-3.492)**	**(0.332)**	**(-4.098)**	**(-4.128)**	**(-0.154)**
Fee Income Share	0.001**	0.000	0.002**	-0.000	-0.001	0.001**
	(1.993)	(0.489)	(2.010)	(-0.595)	(-1.626)	(2.022)
County Real Income Growth	-0.001***	-0.001***	0.000	-0.001***	-0.001***	-0.000
	(-6.370)	(-7.342)	(0.566)	(-10.753)	(-11.030)	(-1.215)
Yield Curve Spread	0.014***	0.013***	0.009	0.004***	0.003**	0.007**
	(8.007)	(8.443)	(1.572)	(3.613)	(2.103)	(2.102)
Constant	0.873***	0.885***	0.803***	0.385***	0.396***	0.359***
	(138.709)	(115.421)	(44.995)	(76.362)	(60.438)	(33.275)
Year FE	NO	NO	NO	NO	NO	NO
Observations	6,887	6,887	6,887	6,887	6,887	6,887
Banks	1,098	1,098	1,098	1,098	1,098	1,098
R-squared	0.261	0.268	0.013	0.192	0.162	0.018
Bank FE	YES	YES	YES	YES	YES	YES

Table 12. Regression for small banks.

This table presents tests for the effect of the Eurozone crisis on portfolio diversification in terms of asset classes (Panel A) and issuers (Panel B). We repeat the estimations of model (2) with standard errors clustered at the bank level like in Table 3 but the sample is constrained to small banks, defined as banks whose total assets are equal to or below the asset size of the median bank. *Crisis* is a dummy variable that takes on the value one for the 2009-2012 period, and zero otherwise. *Treatment* is a dummy variable equal to one if in 2009 the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. The effect of the European sovereign debt crisis is assessed by examining the impact of *Interaction = Crisis × Treatment. Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Panel A: HHI-Asset Class			Panel B: HHI-Issuer		
SUBPANEL: With Year FE	Full Sample	Households	Firms	Full Sample	Households	Firms
Crisis	-0.055***	-0.054***	-0.018	-0.009***	-0.008***	-0.010
	(-12.456)	(-12.318)	(-0.994)	(-3.217)	(-2.759)	(-0.842)
Interaction	**-0.021*** **	**-0.020*** **	**0.036***	**-0.015*** **	**-0.015*** **	**0.030****
	(-3.817)	**(-3.762)**	**(1.789)**	**(-4.333)**	**(-4.379)**	**(2.364)**
Fee Income Share	0.001	0.001	0.000	0.000	0.000	0.000
	(1.539)	(1.099)	(0.134)	(0.767)	(0.048)	(0.161)
County Real Income Growth	0.000	0.000*	-0.000	-0.000	-0.000	0.001
	(1.591)	(1.725)	(-0.212)	(-0.599)	(-0.367)	(0.727)
Constant	0.835***	0.837***	0.602***	0.341***	0.345***	0.303***
	(99.581)	(90.466)	(22.873)	(47.525)	(47.171)	(17.785)
Year FE	YES	YES	YES	YES	YES	YES
Observations	6,760	6,760	6,760	6,760	6,760	6,760
Banks	1,020	1,020	1,020	1,020	1,020	1,020
R-squared	0.362	0.370	0.008	0.200	0.208	0.004
Bank FE	YES	YES	YES	YES	YES	YES
SUBPANEL: With Yield Curve Spread	Full Sample	Households	Firms	Full Sample	Households	Firms
Crisis	-0.087***	-0.087***	-0.041**	-0.026***	-0.025***	-0.020*
	(-17.020)	(-17.054)	(-2.250)	(-7.839)	(-7.478)	(-1.822)
Interaction	**-0.020*** **	**-0.020*** **	**0.036***	**-0.015*** **	**-0.015*** **	**0.030****
	(-3.715)	**(-3.658)**	**(1.797)**	**(-4.230)**	**(-4.268)**	**(2.375)**
Fee Income Share	0.000	-0.000	-0.000	-0.000	-0.001	-0.000
	(0.003)	(-0.294)	(-0.301)	(-0.680)	(-1.484)	(-0.210)
County Real Income Growth	-0.001***	-0.001***	-0.000	-0.001***	-0.001***	0.000
	(-4.108)	(-3.970)	(-0.378)	(-8.047)	(-8.207)	(0.652)
Yield Curve Spread	0.021***	0.021***	0.002	0.006***	0.005***	0.001
	(9.698)	(9.233)	(0.281)	(4.020)	(3.529)	(0.203)
Constant	0.856***	0.860***	0.637***	0.363***	0.369***	0.319***
	(109.739)	(93.999)	(25.129)	(58.500)	(55.694)	(19.297)
Year FE	NO	NO	NO	NO	NO	NO
Observations	6,760	6,760	6,760	6,760	6,760	6,760
Banks	1,020	1,020	1,020	1,020	1,020	1,020
R-squared	0.299	0.302	0.004	0.121	0.122	0.003
Bank FE	YES	YES	YES	YES	YES	YES

Table 13. Effect of Eurozone crisis on number of security accounts and total value of securities.

This table examines how the Eurozone crisis affects the number of securities deposit accounts and the total nominal value of securities. The regressions cluster standard errors at the bank level. *Crisis* is a dummy variable that takes on the value one for the 2009-2012 period, and zero otherwise. *Treatment* is a dummy variable equal to one if in 2009 the share of SEZ is larger than the sample median, and zero otherwise. Being time-invariant, *Treatment* is unidentified in the regressions. The effect of the European sovereign debt crisis is assessed by examining the impact of *Interaction = Crisis × Treatment*. *Fee Income Share* measures the share of fee-generating activities as fee income to total bank's income. *County real income growth* measures the growth rate of the regional economy. *Savings Ratio* is calculated as total savings divided by total assets. *** p<0.01, ** p<0.05, * p<0.1.

	Number of accounts				Ln(Total nominal value of securities)
	Households		Firms		
Crisis	-480.957	-307.314	14.951	11.418*	-0.008
	(-0.730)	(-0.430)	(1.631)	(1.829)	(-0.478)
Interaction	**143.606**	**95.576**	**22.992**	**23.970**	**0.005**
	(0.212)	**(0.140)**	**(1.015)**	**(1.015)**	**(0.272)**
Fee Income Share	-8.370	3.658	-4.036	-4.281	0.012**
	(-0.128)	(0.056)	(-0.849)	(-0.852)	(2.577)
County Real Income Growth	-24.011	-23.165	0.218	0.201	-0.000
	(-1.020)	(-1.003)	(0.668)	(0.640)	(-0.073)
Savings Ratio		-172.933		3.519	
		(-1.562)		(0.913)	
Constant	11,832***	23,930***	135.595**	-110.561	17.356***
	(13.073)	(3.094)	(2.174)	(-0.529)	(245.028)
Year FE	YES	YES	YES	YES	YES
Observations	13,647	13,647	13,647	13,647	13,647
Banks	2,118	2,118	2,118	2,118	2,118
R-squared	0.002	0.006	0.002	0.005	0.153
Bank FE	YES	YES	YES	YES	YES

Figure 1. Market value of stocks for median portfolio and number of accounts for median bank.

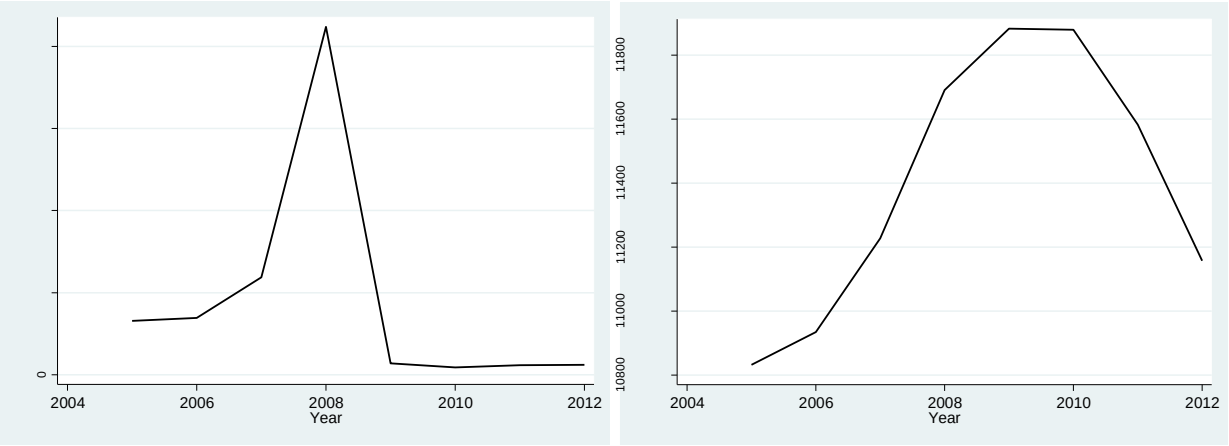
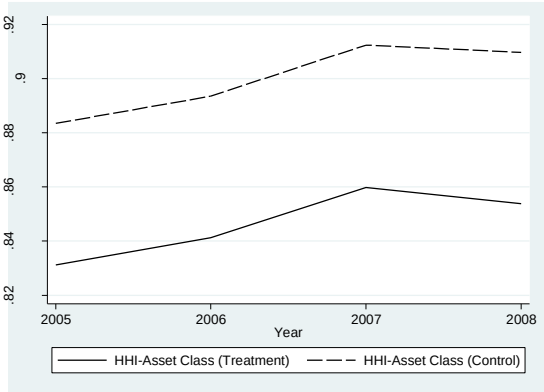


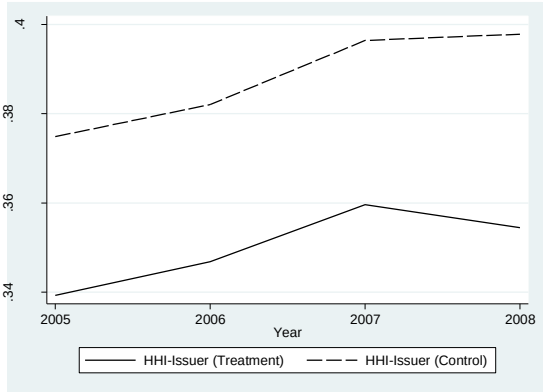
Figure 2. Parallel trend assumption tests for the DiD on the Eurozone crisis: Pre-treatment period.

Each graph shows the time trend (from 2005 to 2008) of the dependent variable for the treatment group (solid line) and control group (dashed line).

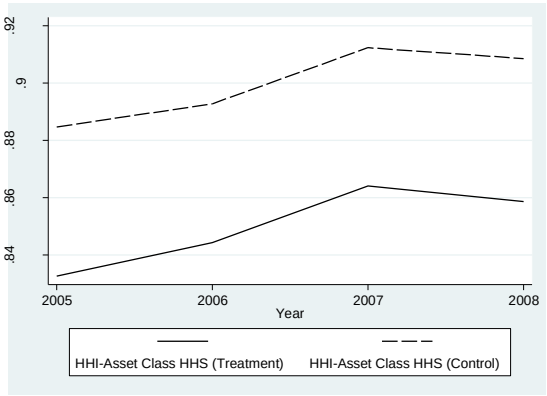
a) HHI-Asset Class



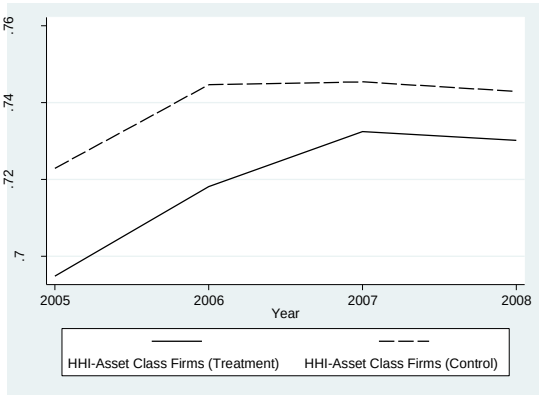
b) HHI-Issuer



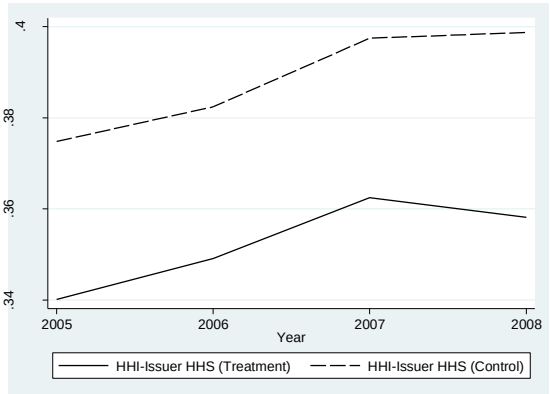
c) HHI-Asset Class (Households)



d) HHI-Asset Class (Firms)



e) HHI-Issuer (Households)



f) HHI-Issuer (Firms)