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The effects of geopolitical risk on sovereign debt holders in the euro area

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Abstract

We use confidential granular data on euro area sovereign bond holdings to examine the heterogeneous behavior of investor types in response to country-specific geopolitical risk shocks. By distinguishing investor categories and accounting for their bond holding dynamics over time, we provide an empirical assessment of how different bond holders react to geopolitics. The analysis employs country-level geopolitical risk indices of the country of sovereign bonds, and applies local projection methods to estimate the dynamic responses of various investor groups to geopolitical risk shocks. In the case of high-debt euro area countries, i.e. Italy, France, Spain, and Belgium, we examine how geopolitical risks may trigger shifts in investor behavior that, in turn, could pose risks to fiscal sustainability.

Keywords: Geopolitical risk, sovereign debt markets, local projections

JEL classification: G10, E02, E62

Non-technical summary

Recent geopolitical tensions, including military conflicts, diplomatic frictions, and economic sanctions, have heightened concerns about the resilience of sovereign debt markets. While the impact of such shocks on government bond yields is well documented, much less is known about how different investor types react to rising geopolitical risk. This distinction matters because the composition of a country's bond holders can either amplify or cushion market stress, with potential implications for fiscal sustainability in high-debt environments. This paper presents novel empirical evidence showing how heterogeneous investors respond to country-specific geopolitical risk shocks. For our analysis, we draw on granular confidential securities holdings data available within the Eurosystem. These data provide information on the distribution of sovereign debt holdings across investor categories. Our analysis focuses on four highly indebted euro area countries: Belgium, Spain, France, and Italy. In addition to the baseline estimations, we also draw on maturity-specific holdings, i.e. holdings of government debt of up to one year, holdings of maturities between one and five years, and maturities over 10 years, respectively. This maturity-based analysis enables us additionally to understand how different holder types behave for different maturity holdings. The empirical findings show that domestic investors often act as stabilizers, sometimes expanding their holdings in response to higher risk, whereas foreign investors tend to reduce exposures more decisively, potentially reflecting stronger risk aversion. Money market funds consistently contract their positions when risk increases, while domestic banks and investment funds frequently expand theirs over the medium term. Insurance companies and pension funds typically adjust more gradually, in some cases increasing exposures initially before reducing them over time. The balance between these stabilizing and destabilizing dynamics differs across countries, which may highlight the role of investor composition in influencing sovereign bond market resilience. We argue that our results underline the importance of understanding investor heterogeneity in understanding how geopolitical shocks affect sovereign debt markets.

1 Introduction

Recent episodes of geopolitical instability, including military conflicts, diplomatic tensions, and sanctions, have raised concerns about the resilience of sovereign bond markets. While the effects of such shocks on sovereign yields are well documented (see, for example, Afonso et al. [2024], Dieckelmann et al. [2024], and Demiralay et al. [2024]), much less is known about the heterogeneous responses of different investor types to geopolitical risk. Understanding these responses is essential to assess how investor composition may influence the fiscal sustainability of a country. Consider, for instance, a highly indebted country that experiences geopolitical tensions. An immediate question arises: do certain investors sell their holdings, thereby enforcing additional pressure on yields, while others step in to absorb the supply? Against this backdrop, we exploit confidential securities holdings data available exclusively to ECB staff. These data provide detailed information on the distribution of sovereign debt holdings across investor groups, i.e. banks, investment funds, money market funds, households, pension funds and insurance companies. We focus on four highly indebted euro area countries, i.e. France, Italy, Spain, and Belgium, where geopolitical risk is particularly salient for market stability. We find that domestic households in Belgium and Italy expand their holdings on impact, while in Spain and France their reactions are delayed. Insurance companies and pension funds often increase exposures initially but subsequently reduce them. Domestic banks expand their positions in Spain, whereas in France they first contract before reversing. Money market funds display their expected short-term risk sensitivity but with mixed signs across countries. Investment funds show opportunistic dynamics, contracting initially but expanding thereafter. Foreign investors generally show stronger risk aversion. In Spain and Italy, most foreign categories reduce exposures markedly, especially money market funds, insurance companies, and investment funds. By contrast, in Belgium and France some foreign investors increase holdings, which may suggest a substitution within European sovereign markets. In sum, the paper provides empirical evidence to understand how investor heterogeneity mediates the effects of geopolitical shocks on sovereign debt markets. The findings carry important implications for fiscal risk monitoring and debt management strategies in the euro area.

The structure of the paper is the following. Section 2 discusses the related literature. In section 3 and 4, we introduce the data we use as well as our econometric approach. Results for domestic and euro area non-domestic investor types will be presented in section 5 and 6, respectively. Section 7 presents the approach we use to measure pure portfolio re-balances including respective results. Finally, chapter 8 concludes.

2 Literature review

Since the pioneering work of Caldara and Iacoviello [2022], much attention has been devoted to understanding the implications of geopolitical risks. Studies include different perceptions of geopolitical risks [Bondarenko et al., 2024], trade and investment fragmentation as a consequence of geopolitical risks [Gopinath et al., 2025], analyses of stock market reactions [Izzeldin et al., 2023], as well as overall effects of geopolitical risks on investments [Wang et al., 2024]. In this paper, we dedicate our focus to the effects of geopolitical risk on sovereign bond holders, and more specifically, we study how they react to country-specific geopolitical risk shocks.

One of the most closely related papers to ours is Afonso et al. [2025]. Using panel data for 24 OECD economies over the period 2004-2023, Afonso et al. find that escalating geopolitical tension reduces government debt holdings among domestic entities, notably domestic banks, while foreign investors increase their ownership, with the effect more pronounced at high portfolio concentration levels. While complementary to our analysis, their study relies on aggregate panel estimates across a broad country sample, whereas we exploit granular, security-level holdings data for four euro area countries and trace the dynamic responses of disaggregated investor categories, allowing us to identify heterogeneous patterns that aggregate estimates would conceal. A related contribution is Dieckelmann et al. [2024], who document that geopolitical risk raises uncertainty and risk aversion across euro area financial markets, can trigger flight-to-safety behavior among investors, and interacts with pre-existing fiscal and financial vulnerabilities to amplify stress [International Monetary Fund, 2025]. Their analysis provides the broad financial stability context within which our investor-level findings should be interpreted.

A growing body of literature emphasizes the importance of investor heterogeneity in shaping sovereign bond pricing and portfolio dynamics more generally. Koijen and Yogo [2019] introduce a demand-system approach to asset pricing that places heterogeneous investor preferences and constraints at the center of asset price determination, showing that differences in demand elasticities across investor types significantly influence sovereign bond pricing and the transmission of monetary policy. Applying a similar perspective to the euro area, Koijen et al. [2021] provide empirical evidence on varying price sensitivities across investor groups, finding that foreign investors exhibit the highest price elasticity while institutional investors such as insurers and pension funds display considerably lower elasticity, pointing to a strong dependence of market responses on investor composition. The lower elasticity of insurers and pension funds is consistent with their liability-driven investment mandates, under which long-duration sovereign bonds are held primarily to hedge interest rate risk on the liability side rather than for return-seeking purposes [Bank for International Settlements, 2011], and with the pro-cyclical capital constraints imposed by Solvency II that can force position reductions when spreads widen [European Central Bank, 2023b]. Breckenfelder and De Falco [2024] also use proprietary granular securities holdings data and show that bonds held by price-elastic investors experience smaller price impacts from ECB purchases, suggesting that the composition of the investor base shapes the transmission of monetary policy. Coppola [2025] further examines the role of long-term institutional investors in stabilizing sovereign bond markets, finding that investor base composition significantly influences bond price dynamics. A recently published article by Fang et al. [2025] provides a cross-country analysis of sovereign debt ownership and its implications for financial stability using a dataset of 101 countries, classifying holders into foreign and domestic banks, non-bank private investors, and official institutions. Their findings emphasize that non-bank private investors hold a substantial share of sovereign debt and show strong sensitivity to yield changes, significantly affecting market depth and the price impact of new debt issuance.

The response of mutual funds and institutional investors to sovereign risk shocks is directly relevant to our setting. Converse and Mallucci [2023] study how bond fund managers react to changes in sovereign default risk across 31 developed and emerging markets. They find that higher yields do not fully compensate investors

for additional sovereign risk, so that fund managers reduce their exposure when default risk increases; crucially, the magnitude of this response is strongly heterogeneous, with managers aggressively reducing positions in high-debt and high-risk countries while remaining lenient toward core developed markets, which receive effective preferential treatment. This pro-cyclical behavior of investment funds is amplified by end-investor redemption pressures during stress episodes, which can force asset sales and delay any subsequent re-entry [Claessens and Lewrick, 2021], whereas Financial Stability Review analyses find that domestic investors tend to step in as foreign funds withdraw from euro area sovereign markets [European Central Bank, 2023a, 2024]. This sensitivity extends to money market funds, whose structural vulnerability to runs under constant net-asset-value regulation can trigger sharp reductions in sovereign bond holdings when credit risk rises [International Monetary Fund, 2021]. Converse and Mallucci [2025] extend this line of inquiry by showing that geopolitical risk leads to financial fragmentation: fund managers reduce the portfolio weight of countries with elevated geopolitical risk and avoid replacing those positions with other countries in the same geographic region, consistent with broad-based retrenchment rather than simple substitution. The reinforcing feedback between banks and sovereign debt adds a further layer of complexity: the sovereign-bank diabolic loop [Brunnermeier et al., 2016] can cause domestic banks to accumulate sovereign bonds during stress as a carry vehicle, lending them a stabilizer role that contrasts sharply with the pro-cyclical behavior of non-domestic institutional investors. Finally, Crosignani et al. [2025] examine how US mutual funds respond to geopolitical shocks using export-control announcements as a natural experiment, finding that active funds reallocate toward riskier, lottery-type stocks in an attempt to compensate for performance losses, whereas passive funds do not adjust and consequently under-perform.

3 Data

The primary data source we use in this analysis is the Securities Holdings Statistics by Sector (SHSS), a confidential dataset compiled by the European Central

Bank (ECB) and available exclusively to ECB staff.[1] The SHSS provides comprehensive, security-by-security information on the holdings of investors domiciled in the euro area, covering the full universe of securities held by resident sectors[2] in countries of the euro area. The data set is structured at the level of holder country × holder sector × security × time, allowing for a granular analysis of investor behavior over time. Data collection is mandated by ECB Regulation No. ECB/2012/24, and is conducted quarterly by national central banks (NCBs) within the euro area. The reporting obligation applies to all sectors, with data collected either directly from the investors, particularly in the case of financial institutions, or indirectly via custodians for other sectors. The collection framework has been progressively refined through subsequent amendments (ECB/2015/18, ECB/2016/22, ECB/2018/7) and accompanying guidelines (e.g., ECB/2013/07). The SHSS data is supplemented with metadata from the ECB's Centralised Securities Database (CSDB), which enriches the data set with detailed characteristics of individual securities and their issuers. This integration allows for the precise identification of security types, issuer sectors, maturity structures, and other relevant attributes. Further, the data set is available from the fourth quarter of 2013, but we also incorporate the SHSS's experimental data dating back to 2009. It includes both stock (position) data, which captures the total amount of each security held at the end of each quarter, and transaction data, which measures net acquisitions (purchases minus sales), including accrued interest. More specifically, we identify central government debt holdings by isolating issuances classified under 2010 ESA and restricting our dataset to stock values. To also take into account the price effects (portfolio rebalancing effects), all holdings are measured at market value.[3] Our sample is limited to euro-area investors[4] and issuers only, having as a benefit

[1] Due to the confidentiality, we do not provide any descriptive statistics.

[2] Holder-country and holder-sector definitions are based on the 2010 European System of Accounts (ESA). For more information, see https://data.ecb.europa.eu/methodology/securities-holdings-statistics

[3] We acknowledge that including market values may bias our results because it may reflect both, valuation effects as well as active portfolio rebalancing. However, we run the corresponding estimations for the nominal (face) value estimations and find almost identical results across all specifications. Therefore, we chose to construct a measure for rebalancing and run additional estimations capturing the transaction behaviour of investors following country-specific geopolitical risk shocks.

[4] Holdings of the Eurosystem of Central Banks are not included.

that the coverage is generally above well 90 percent for each country and thus very representative while for non-euro area countries coverage is not guaranteed by law and is generally much lower and varies more ([Boermans, 2024]). In addition, the available data on foreign investors in euro-area sovereign debt, reported by euro-area-domiciled custodians, do not include any breakdown by 2010 ESA sector, and therefore, are not included into our analysis. Finally, we then aggregate the data into 9 holder-sectors: households (HHs), insurance corporations (ICs), investment funds (IFs), banks (MFIs), money-market funds (MMFs), non financial corporations (NFCs), other financial institutions (OFIs), pension funds (PFs), and others - and recode any negative market values (i.e. short positions) as null.

4 Econometric estimation

We estimate the effects of country-specific geopolitical risk shocks on the holdings of government debt by various types of investors by applying the local projection methodology introduced by Jordà [2005]. Technically, we estimate impulse response functions based on the following specification:

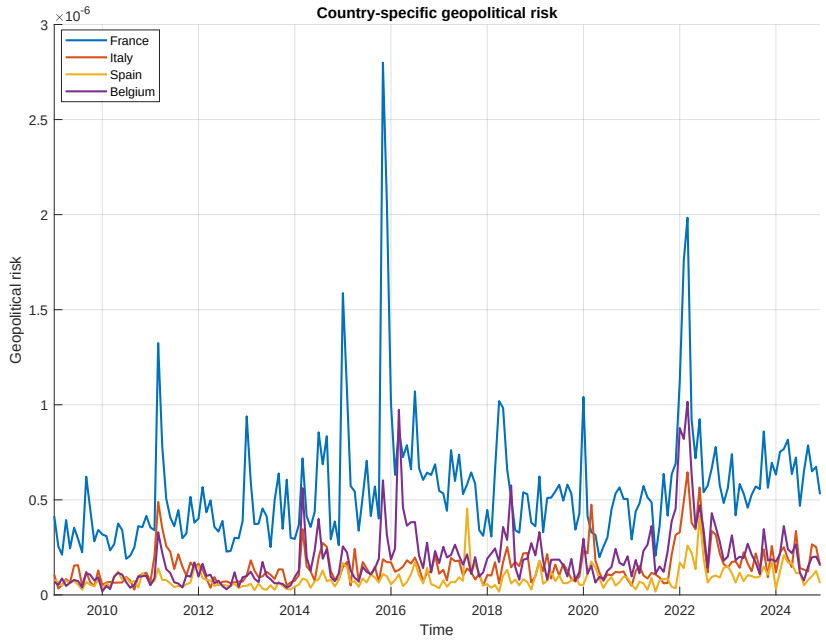
$$y_{i,c,t+h} = \alpha_{c,h} + \beta_{c,h} shock_{c,t} + \gamma_{c,h,} X_{c,t} + \epsilon_{i,c,t+h} \tag{1}$$

where $y_{i,c,t+h}$ denotes the logarithm of holdings of government bonds issued by country c at horizon h, disaggregated by holder type i. The vector $X_{c,t}$ comprises country-specific control variables, i.e. log GDP, log harmonized index of consumer prices (HICP), log gross debt, euro area EuroStoxx50, and Vstoxx, while $shock_{c,t}$ represents the country-specific geopolitical risk shock.[5] For our analysis, we focus on four high-debt euro area countries, i.e. France, Spain, Italy, and Belgium. Further, we differentiate between domestic bond holders and euro area non-domestic investors. Within these groups, holder types are categorized as banks (monetary

[5]Impulse response functions are constructed by plotting the estimated coefficients along with 68 percent confidence intervals over a six-quarter period. An advantage of the local projection (LP) approach is that it allows for straightforward computation of confidence intervals without relying on Monte Carlo simulations or asymptotic approximations. However, a known limitation of the LP method is that the confidence bands tend to widen at longer horizons. Consistent with the framework described by Cevik and Jalles [2024], we rely on 68 percent confidence bands which offer a more informative and precise view of the true underlying uncertainty.

financial institutions), investment funds, money market funds, insurance companies, pension funds, households, non-financial corporations, other financial intermediaries, and others. Further, we refine the analysis by additionally segmenting holdings according to maturity buckets: short-term (up to one year), medium-term (between one and five years), and long-term (exceeding ten years), while keeping the domestic versus non-domestic distinction.

Figure 1: Country-specific geopolitical risk over time by Caldara and Iacoviello



As a proxy for geopolitical risk, we make use of the country-specific geopolitical risk index developed by Caldara and Iacoviello [2022] that measures global geopolitical risk based on the relative frequency of newspaper articles that reference geopolitical tensions and events. The index is constructed by identifying relevant articles from international newspapers, such as the New York Times and the Wall Street Journal, using a predefined set of keywords related to geopolitical threats (e.g., military buildups, diplomatic tensions) and geopolitical acts (e.g., wars, ter-

rorist attacks). It is computed as the share of such articles relative to the total number of articles published in a given month and normalized to have a mean value of 100 over a historical baseline. Further, the index can be decomposed into two components: one capturing threats and the other capturing realized actions. By design, the GPR index reflects both actual geopolitical events and the perceived risk of future escalation, providing a forward- and backward-looking measure of global political uncertainty.

For the geopolitical risk shock measure, we transform the index into a proxy that can be used as a shock. Specifically, to extract country-specific geopolitical risk shocks, we follow a similar procedure described by Brignone et al. [2025], and isolate the unexpected component of each country-specific geopolitical risk time series. Concretely, we transform the raw quarterly indices, denoted $\text{GPRC}_{c,t}$ for country c at time t, into shock series by estimating and removing their predictable dynamics using univariate autoregressive models.
For each country c, we estimate the following autoregressive model of order four (AR(4)):

$$GPRC_{c,t} = \alpha_c + \sum_{k=1}^{4} \beta_{c,k} GPRC_{c,t-k} + \varepsilon_{c,t} \tag{2}$$

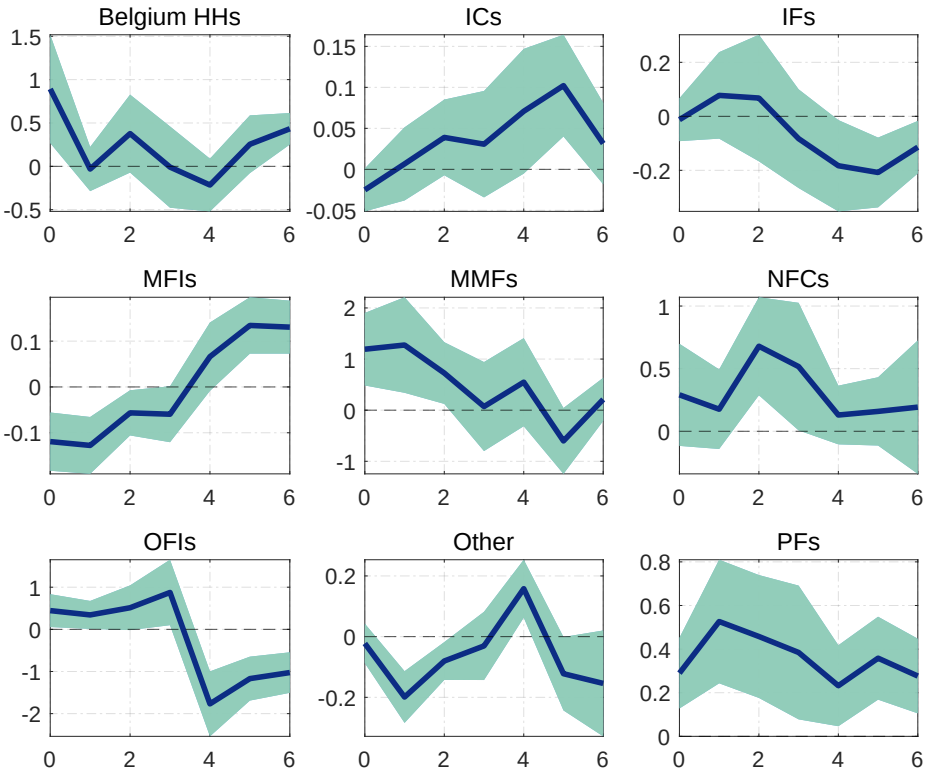
where $\varepsilon_{c,t}$ denotes the residual from the AR(4) process, representing the *innovation* or *shock* to the series that is not predictable from its own recent history. Finally, the estimated residuals $\varepsilon_{c,t}$ are then interpreted as country-specific geopolitical risk innovations. These residuals are used in subsequent estimations as proxies for exogenous, unanticipated changes in country-specific geopolitical risk.

5 Results for Domestic Investors

Figure 2 presents the impulse response functions of different investor categories holding Belgian government debt in response to an increase in Belgian geopolitical risk. The responses vary notably across sectors. Belgian households (HHs) show

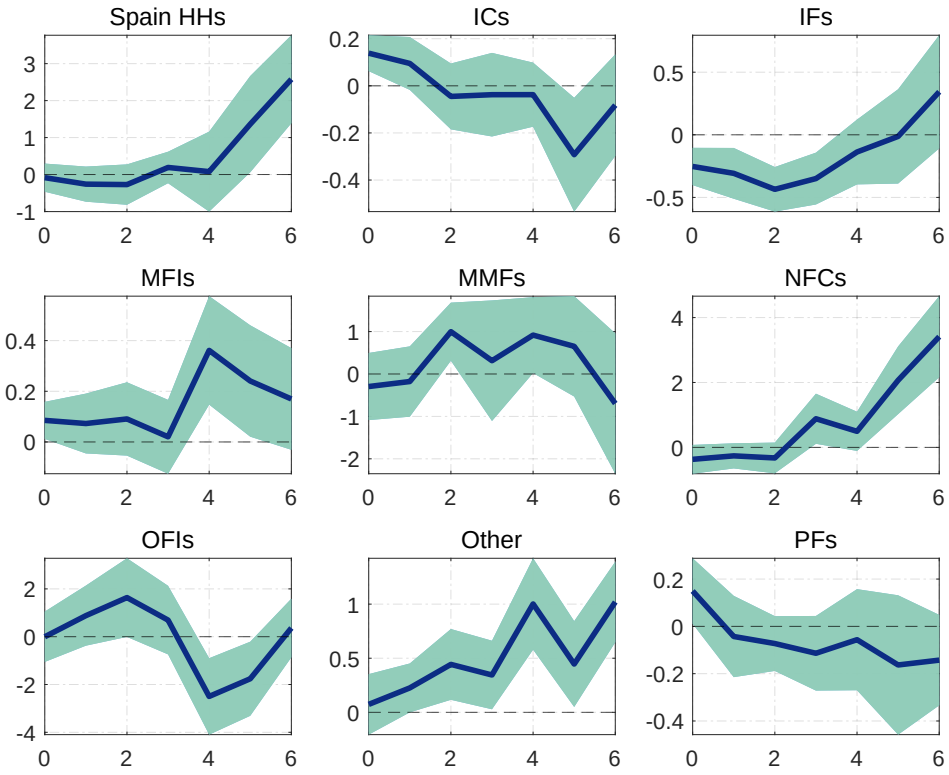
a relatively pronounced positive response on impact, followed by a gradual decline in their holdings over subsequent quarters. In contrast, insurance companies (ICs) and banks (MFIs) display an initial negative reaction but subsequently increase their holdings significantly over the following quarters. Money market funds (MMFs) respond with a sharp increase of approximately 1 percent on impact, yet their holdings decline thereafter. Further, pension funds (PFs) display a comparable pattern. An initial positive response is followed by a moderate increase in holdings during the first quarter, which then reverses in subsequent periods. Non-financial corporations (NFCs) exhibit a similar trajectory to PFs, with an early expansion in holdings followed by a subsequent reduction.

Figure 2: Responses of domestic Belgian sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 3: Responses of domestic Spanish sovereign bond holdings to a geopolitical risk shock

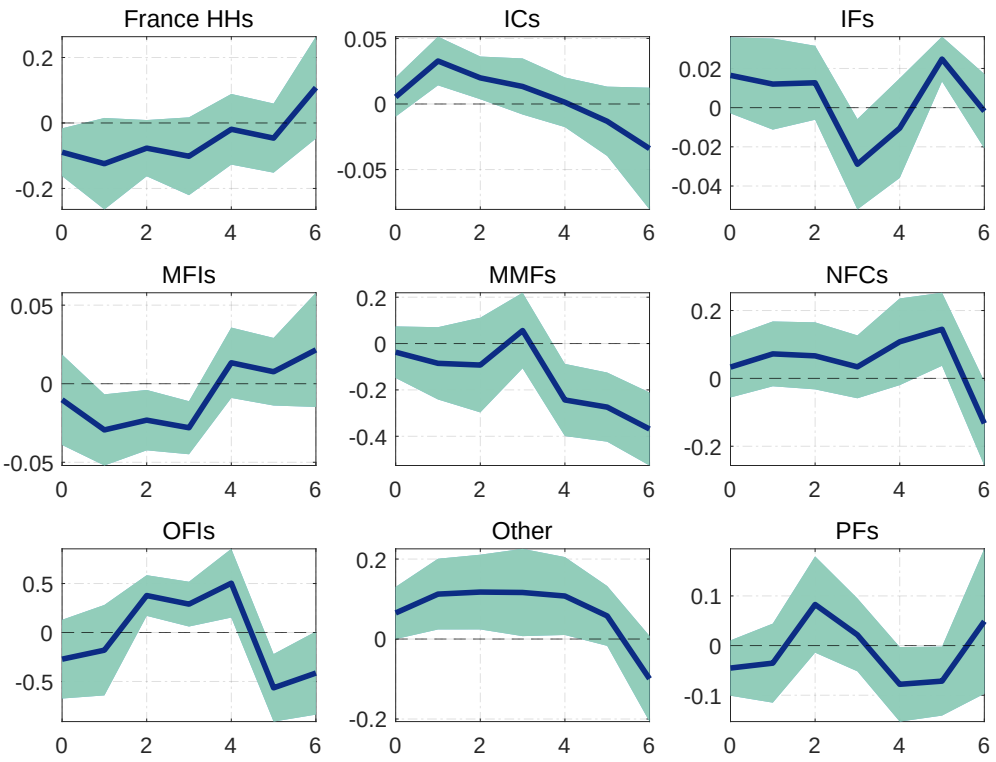


Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 3 illustrates the impulse response functions of domestic investor categories of Spanish government debt in response to heightened Spanish geopolitical risk. The reaction of households (HHs) is initially muted, with no significant change observed during the first three quarters. However, their holdings subsequently increase markedly by more than 2 percent. Insurance companies (ICs) and pension funds (PFs) display a comparable response. They mildly response on impact, followed by a pronounced and sustained reduction in their holdings. Investment funds (IFs) show a slightly negative reaction initially, yet their holdings rise in the subsequent quarters. Banks (MFIs) respond with a modest increase on impact and continue to expand their holdings thereafter. Additionally, money market funds (MMFs) show a small negative response on impact, but subsequently increase their

holdings by nearly 1 percent in the first quarter.

Figure 4: Responses of domestic French sovereign bond holdings to a geopolitical risk shock

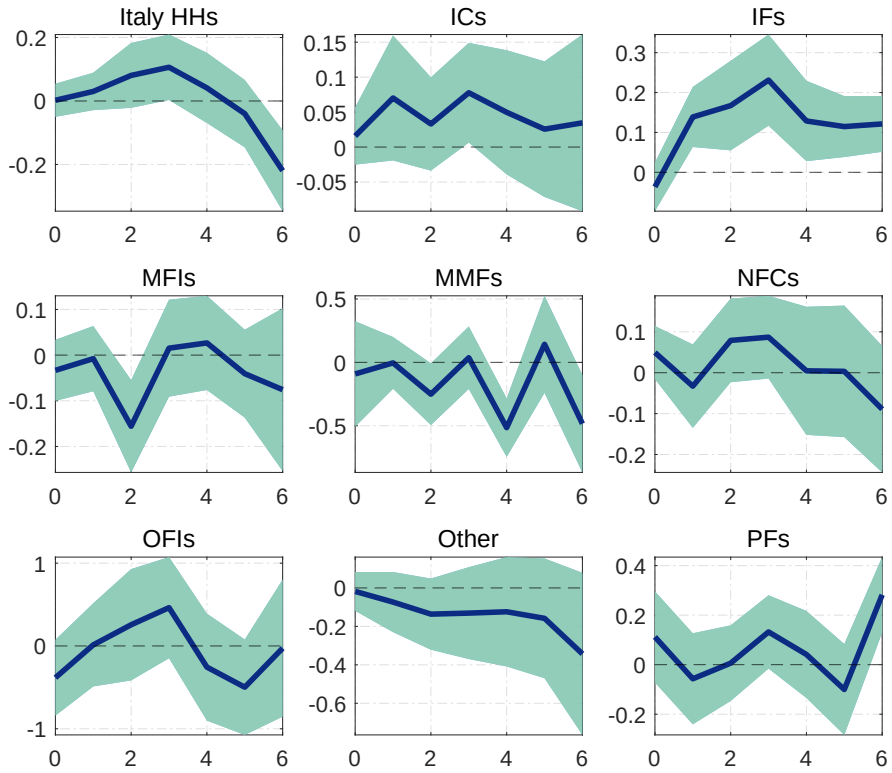


Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

In the case of France (Figure 4), the responses of domestic investor categories to increased French geopolitical risk show varying dynamics. Insurance companies (ICs) respond with a slight increase on impact, followed by a substantial reduction in their holdings. Investment funds (IFs) show a similar initial pattern, but unlike ICs, they begin to increase their holdings after approximately three quarters. Banks (MFIs) reduce their holdings during the first three quarters, but strongly reverse this trend, and hence, increase their holdings. On the other hand, money market funds (MMFs) display a slightly negative reaction on impact and continue

to reduce their holdings overall.

Figure 5: Responses of domestic Italian sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Finally, Figure 5 presents the impulse response functions of Italian investor categories of Italian government debt following an increase in Italian geopolitical risk. We observe that households (HHs) exhibit a mildly positive reaction during the first three quarters followed by a pronounced decline in their holdings. In contrast, banks (MFIs) show a slightly negative initial response and continue to reduce their holdings over the first two quarters, after which they begin to increase their exposure to Italian debt. Further, investment funds (IFs) and other financial institutions (OFIs) do not display a significant response on impact but

subsequently increase their holdings considerably. Money market funds (MMFs) display a highly volatile reaction. And finally, insurance companies (ICs), although showing an overall upward trend in their holdings, their response does not show any statistical significance which is similar to the response of pension funds (PFs).

The heterogeneous portfolio responses documented above can be understood through two complementary channels. The first is a yield-mediated channel: geopolitical shocks raise sovereign risk premia and bond yields, altering the relative attractiveness of domestic government bonds [Caldara and Iacoviello, 2022, International Monetary Fund, 2025]. The second is a direct uncertainty channel: geopolitical risk elevates aggregate uncertainty and risk aversion independently of yield movements [Dieckelmann et al., 2024], affecting portfolio composition beyond what price signals alone would predict. The two channels interact with pre-existing fiscal vulnerabilities, so that the same shock generates larger yield increases and more disruptive reallocations in high-debt countries [International Monetary Fund, 2025, Converse and Mallucci, 2023].

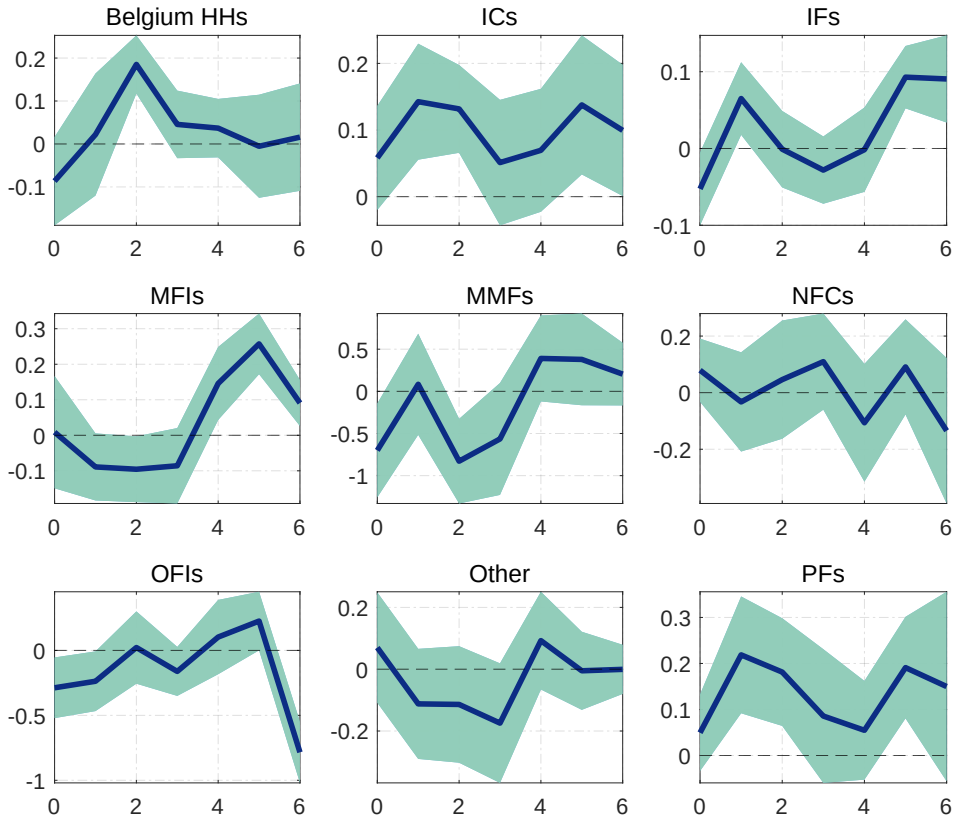
The divergence across investor types reflects well-established differences in mandates and constraints. Households' positive reactions on impact in some countries plausibly reflect a retail flight-to-safety motive, with cross-country timing differences driven by variation in retail bond market depth and the prevalence of national saving instruments [ECB]. Banks' initial reduction followed by medium-term expansion reflects two forces: short-run uncertainty about fiscal trajectories prompts trimming [Afonso et al., 2025], while the zero risk weight of sovereign bonds under Basel rules makes them attractive carry vehicles once yields have risen; over the medium term, the sovereign-bank diabolic loop further reinforces domestic bond accumulation [Brunnermeier et al., 2016], lending banks a stabilizer role. Insurance companies and pension funds hold sovereign bonds primarily to hedge liability-side interest rate risk within a liability-driven investment framework [Bank for International Settlements, 2023]; while a yield rise may briefly compress their duration gap, rising volatility subsequently increases liquidity needs and triggers reductions. Investment funds' delayed expansion reflects a yield-chasing motive constrained initially by end-investor redemption pressures that force pro-cyclical sales [Claessens and Lewrick, 2021]. Finally, the cross-country divergence in money

market fund responses likely reflects structural differences between constant and variable net-asset-value products: the former face run incentives when credit risk rises, the latter may instead increase sovereign bond holdings as a flight-to-quality within the short-term fixed-income universe [International Monetary Fund, 2021].

6 Results for Non-Domestic Investors

Figure 6 displays the impulse response functions of euro area non-domestic investor categories of Belgian sovereign debt in the context of rising geopolitical risk. Non-domestic households (HHs) initially show a slight negative response, which is followed by a strong increase in their holdings. Insurance companies (ICs) and pension funds (PFs) respond positively on impact and continue to expand their holdings over the first three quarters. Non-domestic banks (MFIs) show a modest reduction in holdings during the initial three quarters, but subsequently begin to increase their positions significantly. Investment funds (IFs) and money market funds (MMFs) display a negative immediate reaction, however, they increase their holdings over the following two quarters before reducing them again thereafter.

Figure 6: Responses of non-domestic Belgian sovereign bond holdings to a geopolitical risk shock

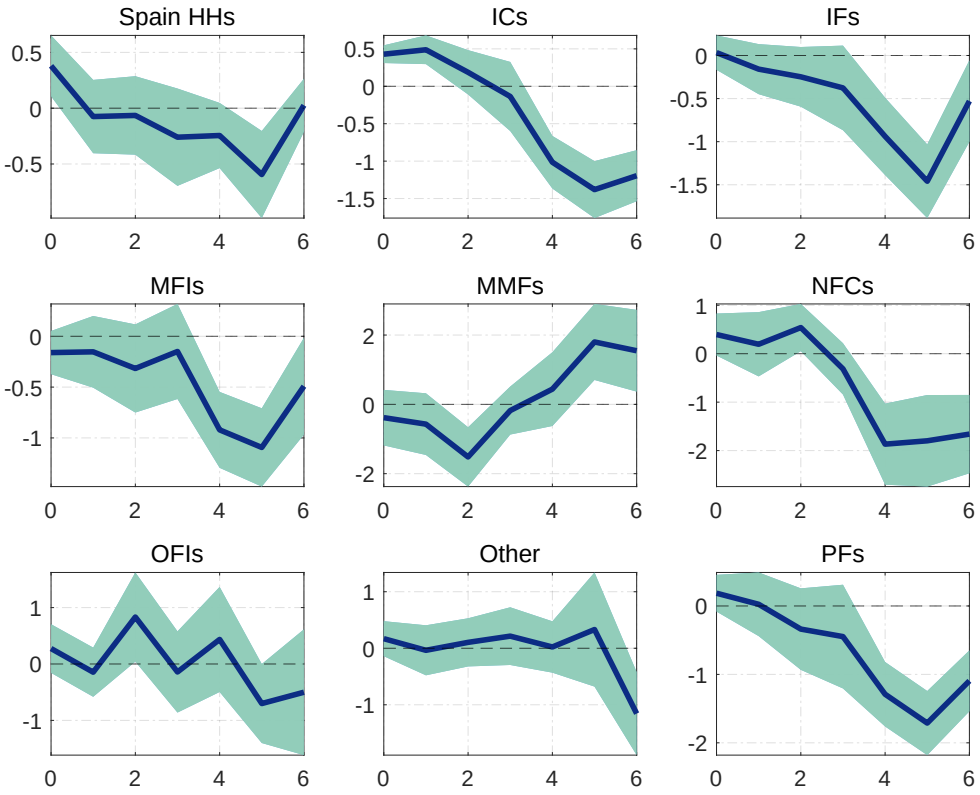


Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 7 illustrates the impulse response functions of non-domestic investor categories of Spanish government debt in response to elevated Spanish geopolitical risk. Non-domestic households (HHs) display a pronounced reduction in their holdings over time. A similar response is observable for insurance companies (ICs), pension funds (PFs), non-financial corporations (NFCs), and investment funds (IFs). Interestingly, all investor types reduce their holdings by approximately 1.5 percent after a few quarters. A similar response is observed among non-domestic banks (MFIs), which show a mildly negative reaction on impact and continue to

significantly reduce their exposure over time. Money market funds (MMFs) also decrease their holdings by nearly 2 percent during the first two quarters, however, their reaction shows a strong recovery afterwards.

Figure 7: Responses of non-domestic Spanish sovereign bond holdings to a geopolitical risk shock

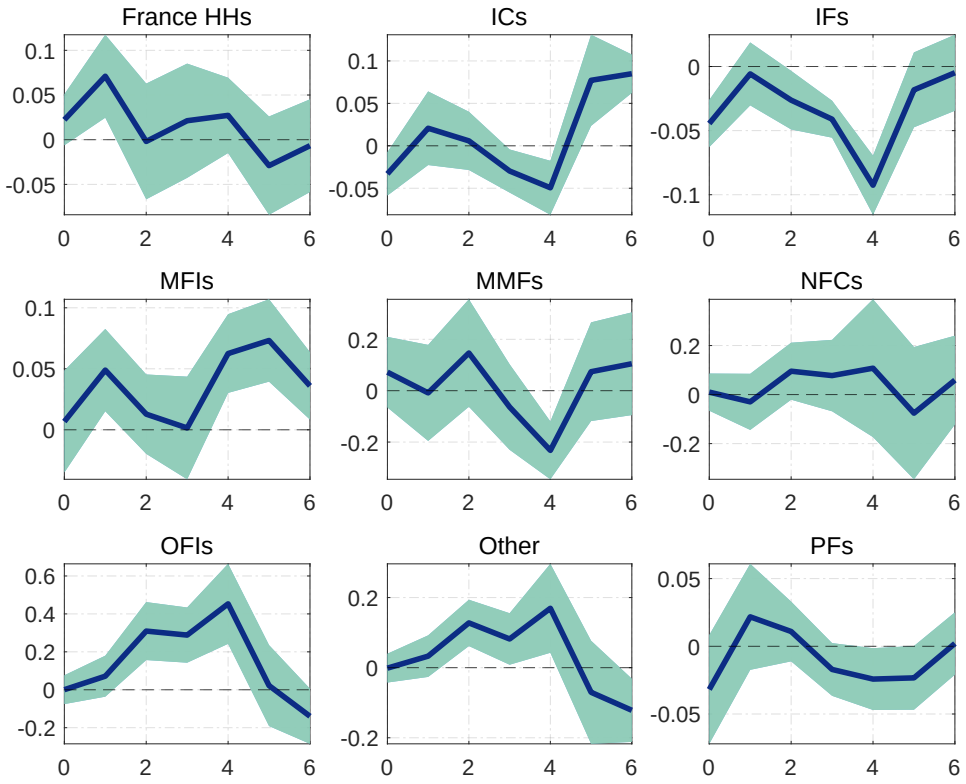


Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

The responses of non-domestic investors of French sovereign debt are presented in Figure 8. Non-domestic households (HHs) show a slight increase in their holdings initially, which is then followed by a subsequent decline. Also, insurance companies (ICs), pension funds (PFs), and investment funds (IFs) react with a slightly

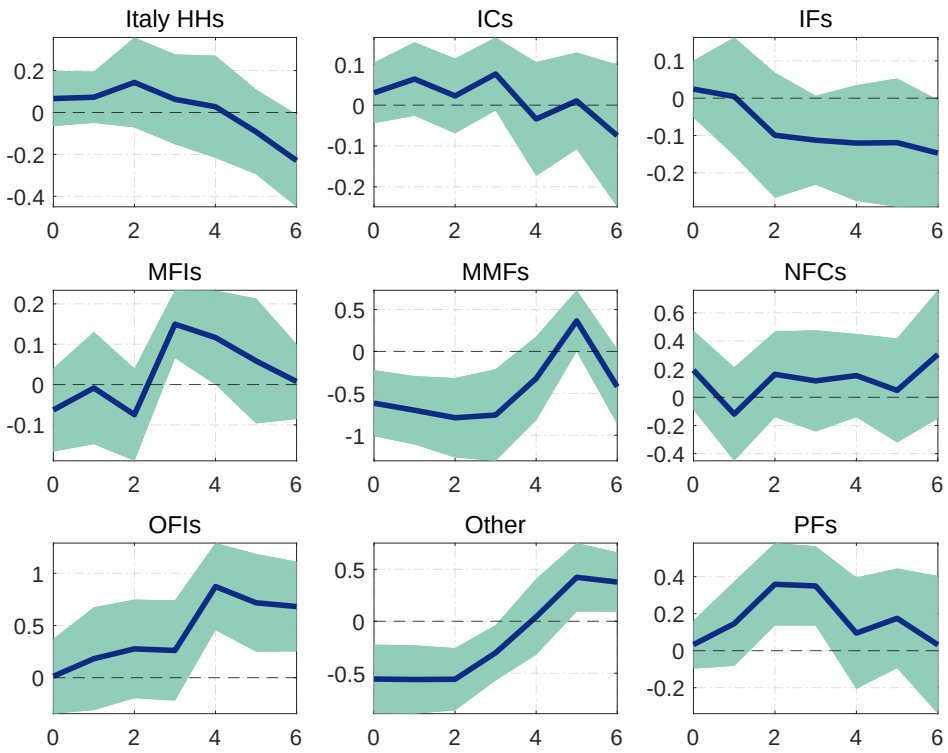
negative response on impact, but show modest increases thereafter. Notably, insurance companies significantly expand their holdings after four quarters, whereas pension funds do not display a comparable upward trend. On the other hand, banks (MFIs) initially increase their holdings slightly. Despite a temporary contraction around the third quarter, they continue to expand their holdings in the subsequent periods. Finally, money market funds (MMFs) respond positively on impact, but reduce their holdings substantially after two quarters.

Figure 8: Responses of non-domestic French sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 9: Responses of non-domestic Italian sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Finally, Figure 9 presents the impulse response functions of non-domestic investor categories of Italian sovereign debt in the context of rising Italian geopolitical risk. Non-domestic households (HHs) show an overall reduction in their holdings. Insurance companies (ICs) and investment funds (IFs) display comparable responses, both in direction and magnitude, similarly decreasing their exposure. In contrast, banks (MFIs) react slightly negative on impact but markedly increase their holdings in the third quarter. Further, money market funds (MMFs) respond relatively strongly negative on impact and only begin to increase their holdings after four

quarters. On the other hand, pension funds (PFs) increase their holdings steadily over the first three quarters before showing a slight decline subsequently.

The more consistent retrenchment of foreign investors relative to domestic ones is broadly in line with the assumption that information asymmetries and the absence of a home-country bias amplify the sensitivity of cross-border holdings to geopolitical shocks [Ahearne et al., 2004, Converse and Mallucci, 2023]. Foreign investors face higher uncertainty about the fiscal and political consequences of domestic geopolitical events, and are more prone to disengage when sovereign risk rises, as documented by ECB analyses for both sovereign stress episodes and global risk shocks [European Central Bank, 2024, 2023a]. In this regard, geopolitical risk acts partly as a trigger for financial fragmentation: Converse and Mallucci [2025] show that when geopolitical risk increases, bond fund portfolios become more concentrated, the number of destination countries declines, and the political distance of holdings relative to the country of residence falls, consistent with the pattern of retrenchment we observe for foreign ICs and IFs in Spain and Italy. The partial reversals visible in Belgium and France likely reflect those countries' relatively lower fiscal vulnerabilities and stronger perceived geopolitical alignment, which attenuate the flight from cross-border positions [European Central Bank, 2025, International Monetary Fund, 2025]. Foreign banks' initial contraction followed by a medium-term expansion mirrors the pattern observed for domestic banks and can be rationalised by the same carry-trade and zero-risk-weight logic, albeit amplified by cross-border funding considerations: as country-specific yields rise, foreign banks with existing market access find it profitable to re-enter [Brunnermeier et al., 2016]. The greater heterogeneity of foreign households likely reflects the compositional diversity of these categories across source countries, where differences in retail saving cultures and local geopolitical salience produce divergent responses to the same country-specific shock.

7 Measuring Portfolio Rebalancing

The analysis of market value holdings presented in the preceding section captures the total valuation of sovereign bond positions held by each investor type. How-

ever, changes in market values reflect both price movements and active investor decisions. To isolate the latter, we extend the analysis by constructing an explicit measure of portfolio rebalancing using nominal value data. Specifically, we exploit transaction data, recording the nominal value of sovereign bond purchases and sales, to capture the active buying and selling behaviour of investors in response to country-specific geopolitical risk shocks.

7.1 Construction of the Rebalancing Measure

We define the rebalancing measure as the net change in nominal bond holdings between two consecutive periods:

$$\Delta N_{i,c,t} = N_{i,c,t} - N_{i,c,t-1} \tag{3}$$

where $N_{i,c,t}$ denotes the nominal value of sovereign bonds issued by country c and held by investor type i at time t, measured in millions of euros. The first difference $\Delta N_{i,c,t}$ captures the net flow of transactions: positive values correspond to net purchases and negative values correspond to net sales. This measure therefore provides a direct proxy for active portfolio rebalancing behaviour, purged of valuation effects arising from changes in bond prices.

7.2 Transformation of the Dependent Variable

A standard approach in empirical macroeconomics is to work with log-transformed variables, as this facilitates the interpretation of regression coefficients as approximate percentage changes. However, the natural logarithm is undefined for zero and negative values, and the transaction-based rebalancing measure $\Delta N_{i,c,t}$ takes negative values whenever investors are net sellers, rendering a straightforward log transformation infeasible.

To address this, we apply the inverse hyperbolic sine (IHS) transformation, defined as:

$$\widetilde{\Delta N}_{i,c,t} \;=\; \operatorname{arcsinh}(\Delta N_{i,c,t}) \;=\; \ln\!\left(\Delta N_{i,c,t} + \sqrt{\Delta N_{i,c,t}^2 + 1}\right) \tag{4}$$

The IHS transformation is defined over the entire real line, accommodating positive, zero, and negative values alike, and thus encompasses the full distribution of net transaction flows without requiring sample truncation or ad hoc adjustments to the data [Burbidge et al., 1988]. Its use as a substitute for the natural logarithm in regression models where the dependent variable takes on economically meaningful nonpositive values has been advocated in the literature [Pence, 2006]. For large absolute values of the argument, the IHS transformation closely approximates the natural logarithm, differing only by $\ln(2)$, so that estimated coefficients retain an approximate semi-elasticity interpretation [Bellemare and Wichman, 2020]. The transformation is furthermore symmetric around zero, meaning that net purchases and net sales of equal magnitude are treated symmetrically on the transformed scale.

Unlike the natural logarithm, however, the IHS transformation is not invariant to rescaling of the underlying variable, so that regression results can in principle depend on the units of measurement [Aihounton and Henningsen, 2021]. The approximate log-equivalence holds reliably when the mean absolute value of the untransformed variable is sufficiently large. In our application, transaction data are expressed in millions of euros, such that the typical magnitude of $|\Delta N_{i,c,t}|$ comfortably exceeds this threshold.

7.3 Local Projections Specification

The IHS-transformed rebalancing measure is incorporated into the local projection framework of Jordà [2005]. For each horizon $h = 0, 1, \ldots, H$, we estimate:

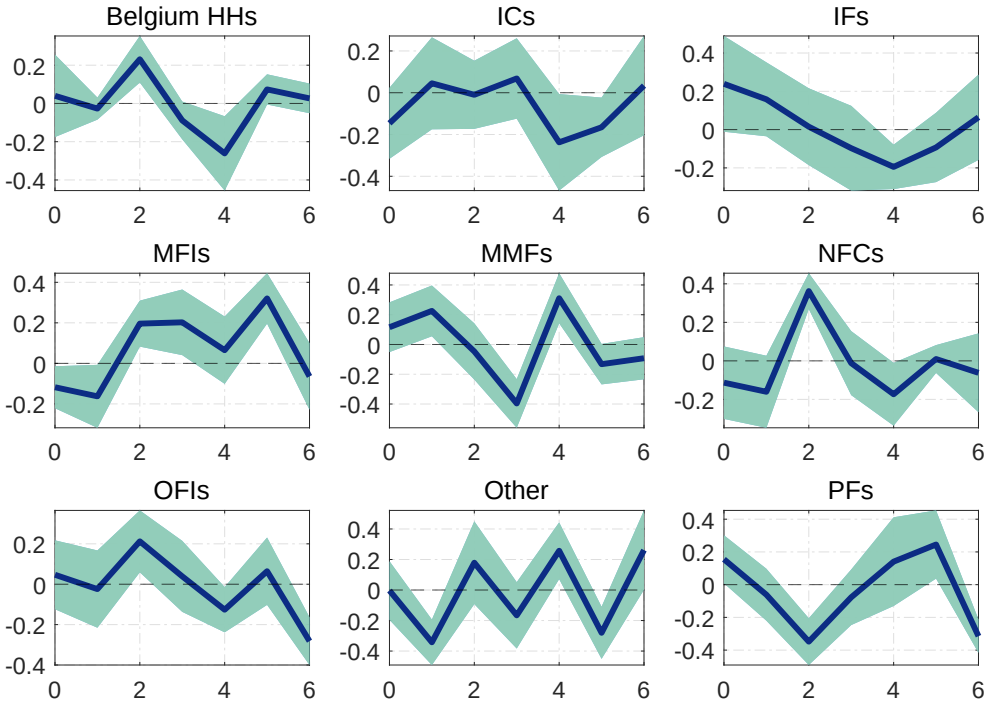
$$\widetilde{\Delta N}_{i,c,t+h} \;=\; \alpha_{c,h} \;+\; \beta_{c,h}\,\text{shock}_{c,t} \;+\; \gamma_{c,h}\,X_{c,t} \;+\; \epsilon_{i,c,t+h} \tag{5}$$

where $\widetilde{\Delta N}_{i,c,t+h} = \operatorname{arcsinh}(\Delta N_{i,c,t+h})$ is the IHS-transformed net transaction flow for investor type i in country c at horizon h, $\text{shock}_{c,t}$ is the country-specific geopolitical risk innovation constructed as described in equation (2), and $X_{c,t}$ is the vector of country-specific control variables defined in the preceding section. The sequence of estimated $\hat{\beta}_{c,h}$ coefficients, plotted across horizons $h = 0, 1, \ldots, H$, traces the impulse response of portfolio rebalancing activity to a one-unit geopolitical risk shock. Given that the IHS transformation operates in its quasi-logarithmic regime

in our sample, these coefficients can be interpreted as approximate semi-elasticities, capturing the proportional change in the magnitude of net sovereign bond transactions in response to the shock [Bellemare and Wichman, 2020]. Consistent with the approach adopted in the market value specification, impulse response functions are plotted with 68 percent confidence intervals over a six-quarter horizon.

7.4 Results for Domestic Investors

Figure 10: Responses of domestic Belgian sovereign bond transactions to a geopolitical risk shock

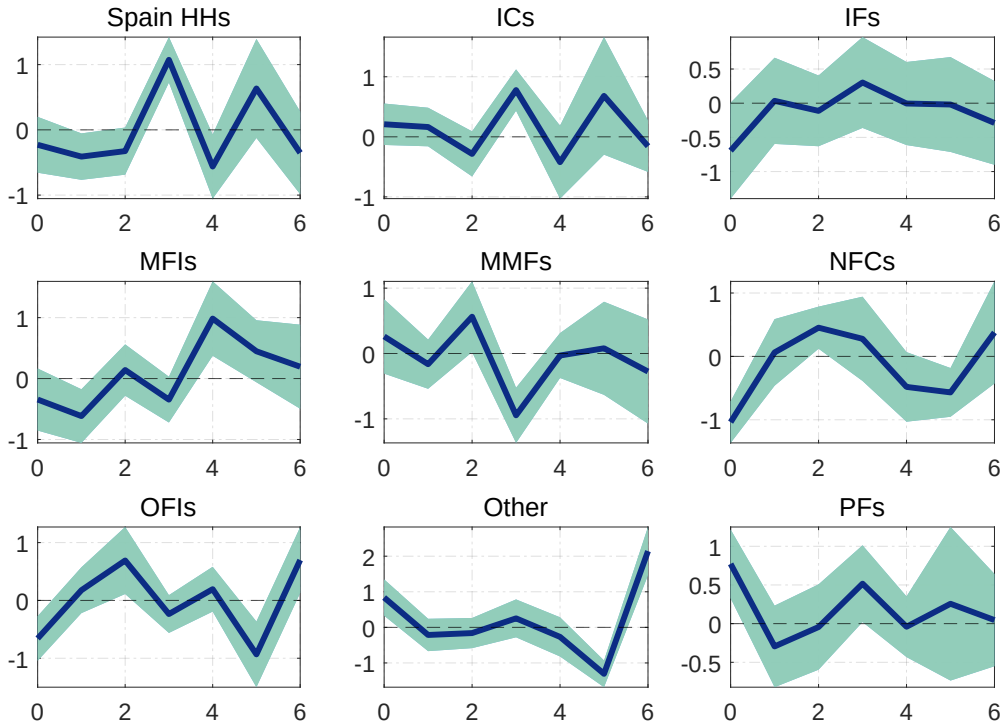


Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 10 displays the responses of Belgian sovereign bond holders measured by transactions, capturing how each sector actively rebalances its holdings in response to a Belgian geopolitical risk shock. A direct comparison with Figure 2 reveals that these transaction-based responses are, in several cases, considerably more volatile

than their holdings-based counterparts. This pattern is economically meaningful: by isolating the pure rebalancing effect and abstracting from valuation changes, the transaction measure strips out the mechanical price revaluation of existing positions and retains only the deliberate portfolio adjustment decisions of each investor type. The heightened volatility therefore reflects genuine active reallocation behaviour rather than passive mark-to-market fluctuations. Interestingly, banks (MFIs), money market funds, and investment funds display qualitatively comparable response patterns to those identified in the baseline. This attenuation is consistent with the interpretation that a non-trivial share of the holdings movements documented in the baseline reflects valuation effects rather than active rebalancing: once yields rise following a geopolitical shock, the market value of existing sovereign bond portfolios declines mechanically, compressing measured holdings even in the absence of any active selling.

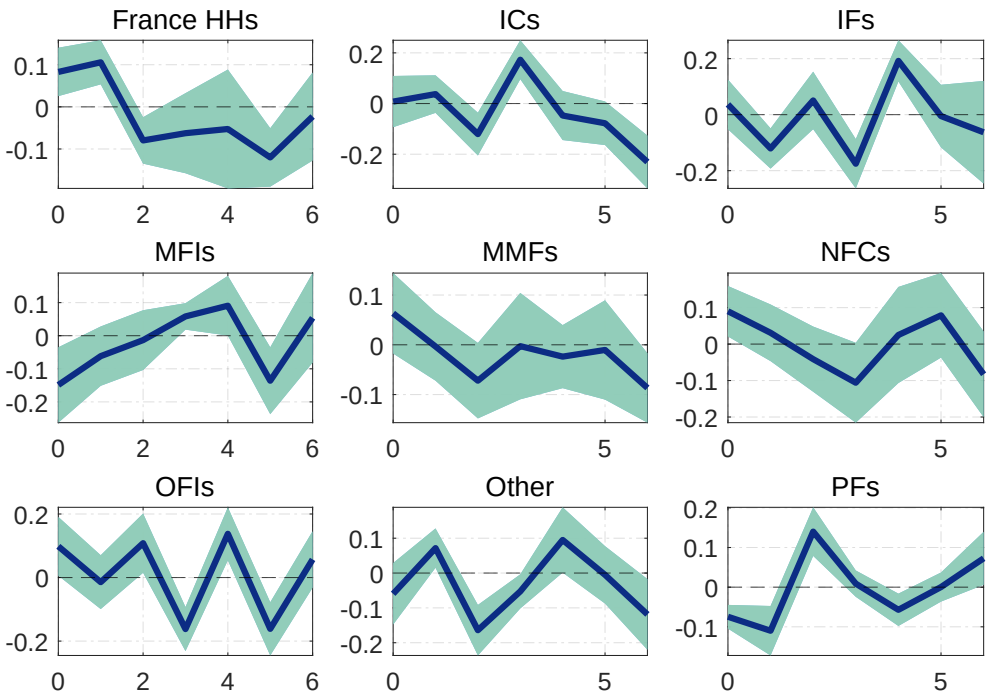
Figure 11: Responses of domestic Spanish sovereign bond transactions to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

For Spain, Figure 11 similarly reveals more volatile transaction-based reactions relative to the holdings baseline. Notably, and consistent with the pattern observed for France, the responses of banks, other financial intermediaries, and pension funds display a broadly similar qualitative trajectory to their baseline counterparts, suggesting that active rebalancing constitutes a substantial component of the total portfolio adjustment for these investor types.

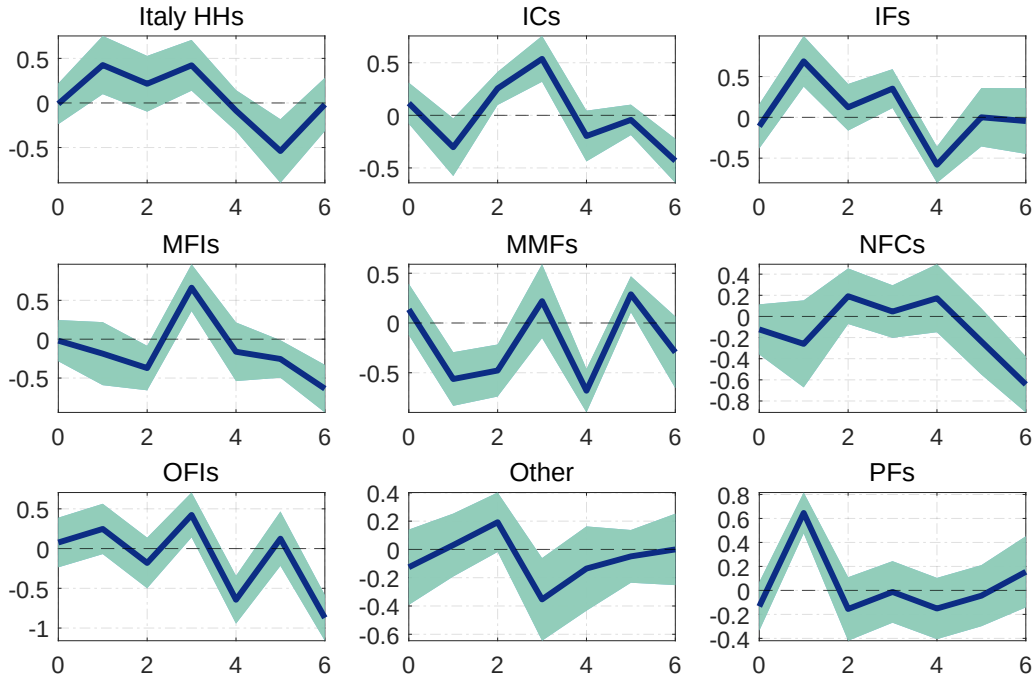
Figure 12: Responses of domestic French sovereign bond transactions to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 12 presents the transaction-based responses of French sovereign bond holders. Comparing these with the baseline holdings estimation again reveals qualitatively similar dynamics for banks, money market funds, and pension funds, reinforcing the interpretation that active portfolio rebalancing is the dominant driver of observed holdings changes for these sectors in the French case.

Figure 13: Responses of domestic Italian sovereign bond transactions to a geopolitical risk shock

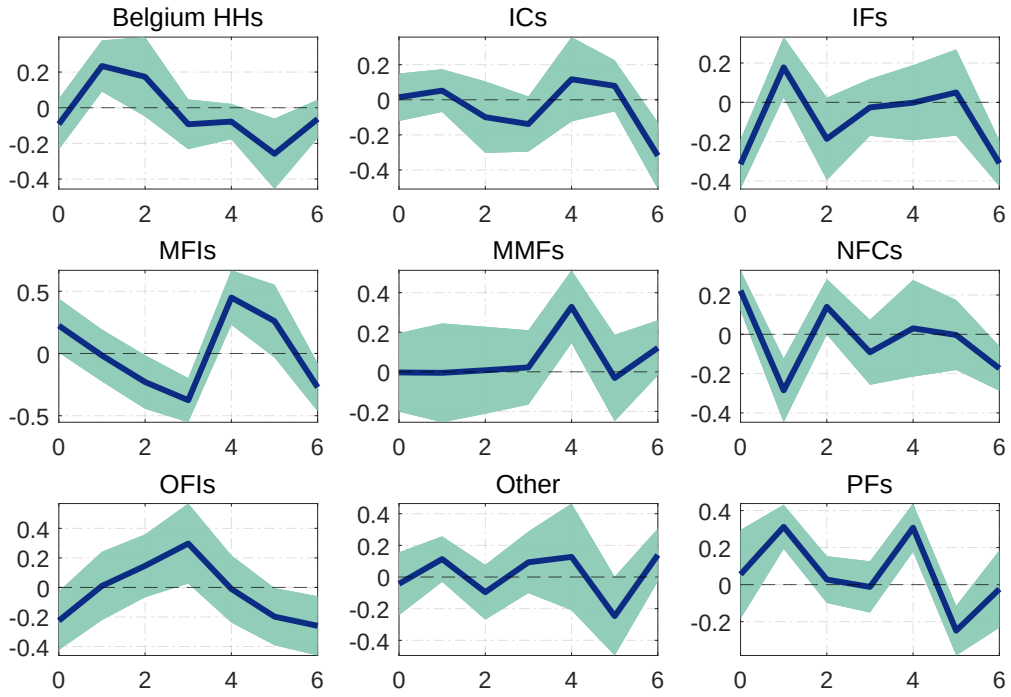


Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Finally, Figure 13 presents the corresponding transaction-based reactions of Italian sovereign bond holders. A direct comparison with the Italian baseline estimation in Figure 5 reveals that domestic households, investment funds, and non-financial corporations (NFCs) exhibit strikingly similar response paths in both specifications, with magnitudes that are in several cases even larger in the transaction-based measure.

7.5 Results for Non-Domestic Investors

Figure 14: Responses of non-domestic Belgian sovereign bond transactions to a geopolitical risk shock



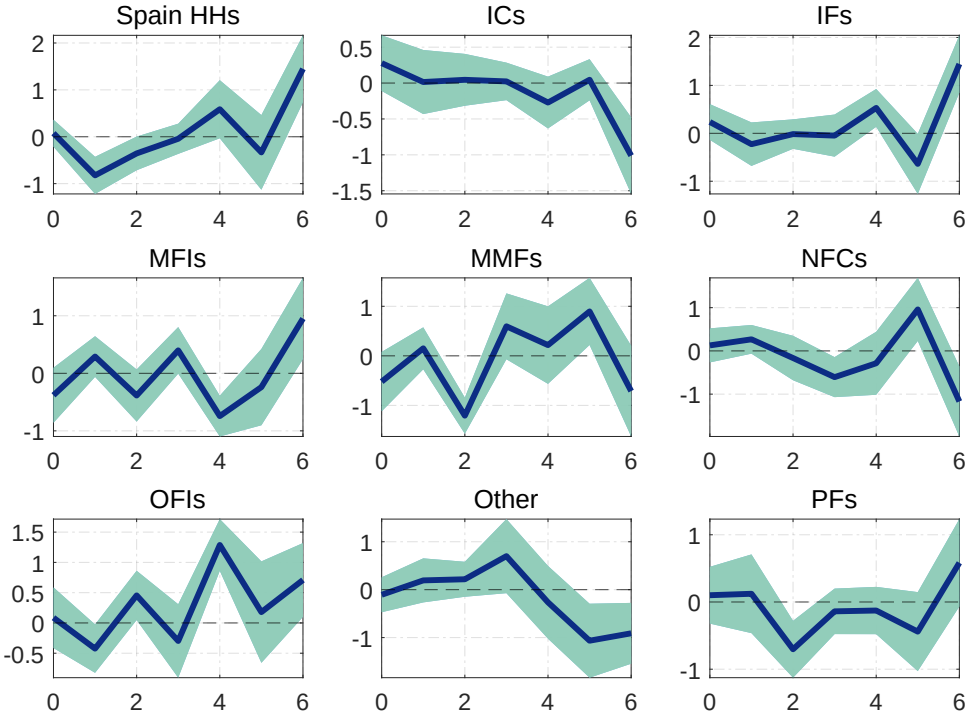
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 14 shows the transaction-based responses of non-domestic sovereign bond holders in Belgium. A direct comparison with Figure 6 reveals that households, investment funds, pension funds, and banks display qualitatively similar response patterns to the baseline, albeit with larger magnitudes. In the context of the transaction measure, this indicates that the active rebalancing behaviour of these investor types accounts for, and indeed exceeds, the holdings-based dynamics documented in the baseline, suggesting that valuation effects partially offset the underlying rebalancing impulse in the baseline specification. The amplified retrenchment is broadly consistent with the notion that foreign investors disengage more decisively from cross-border positions when sovereign risk rises [European Central

Bank, 2024, 2023a].

Figure 15 displays the transaction-based portfolio rebalancing of non-domestic investor types in Spanish sovereign bonds. Again, the responses are qualitatively similar to the baseline estimation. Households, investment funds, and money market funds display comparable reaction patterns, though interestingly with smaller magnitudes relative to the baseline. This attenuation suggests that a portion of the holdings-based movements documented for Spain reflects valuation effects rather than active rebalancing, so that the discretionary adjustment margin is more limited than the total holdings response would imply.

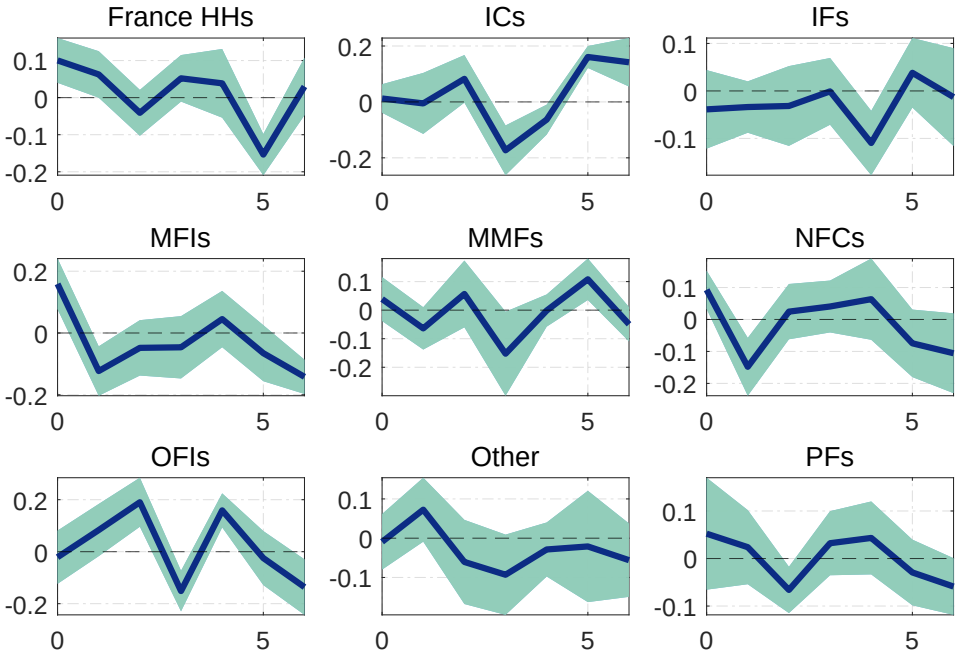
Figure 15: Responses of non-domestic Spanish sovereign bond transactions to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 16 presents the transaction-based responses of non-domestic investors in French sovereign bonds. Comparing these results with the corresponding baseline reveals that households, money market funds, investment funds, and partly insurance companies react in a qualitatively similar fashion, but here with larger magnitudes. This pattern suggests that active rebalancing may be the dominant driver of the observed portfolio movements, with valuation effects providing only partial offset.

Figure 16: Responses of non-domestic French sovereign bond transactions to a geopolitical risk shock

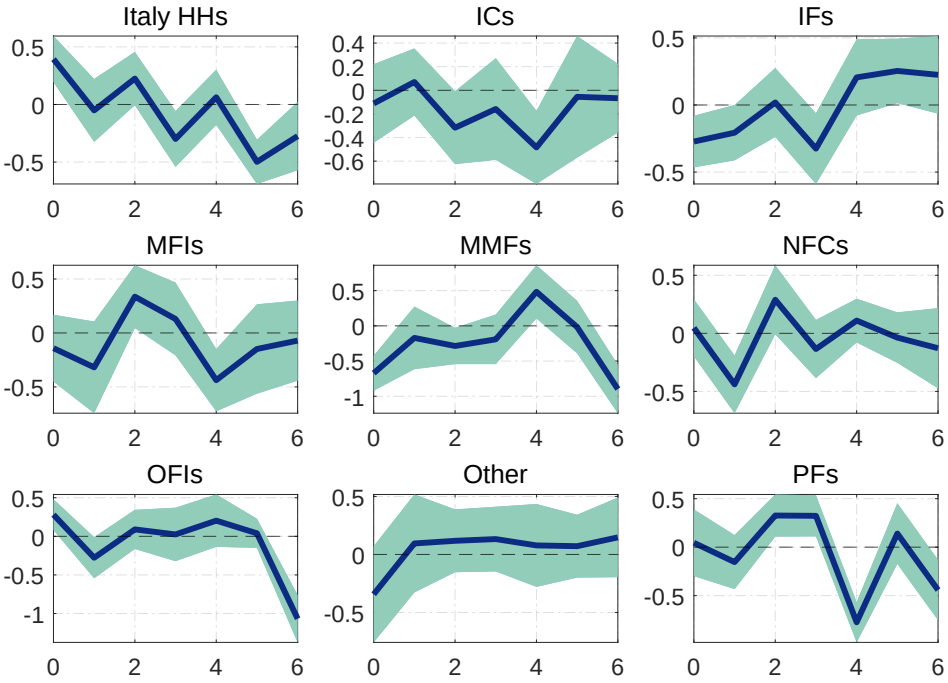


Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Finally, Figure 17 displays the transaction-based responses of non-domestic investors in Italian sovereign bonds. The reactions of insurance companies, investment funds, banks, money market funds, and non-financial corporations are more negative in direct comparison with the baseline estimation, indicating that the portfolio rebalancing effect is dominant in the Italian case. This finding is

consistent with the broader pattern that geopolitical shocks generate larger and more disruptive cross-border retrenchment in high-debt environments [International Monetary Fund, 2025, Converse and Mallucci, 2023], where foreign investors face greater uncertainty about fiscal trajectories and are more prone to disengage when sovereign risk rises [European Central Bank, 2024].

Figure 17: Responses of non-domestic Italian sovereign bond transactions to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

8 Conclusion

This paper presents empirical evidence on how the composition of sovereign bond holders reacts to country-specific geopolitical risk shocks. Using confidential security holdings data from the Eurosystem, we document the dynamic responses of

various investor categories, both domestic and euro area non-domestic, to geopolitical risk shocks in four euro area countries: Belgium, Spain, France, and Italy. Our findings contribute to a growing literature that links geopolitical uncertainty to financial market outcomes [Caldara and Iacoviello, 2022, International Monetary Fund, 2025, Dieckelmann et al., 2024] by shifting the focus from aggregate price effects to the granular portfolio dynamics of heterogeneous investors.

The empirical findings reveal systematic heterogeneity in responses across investor types and residency. Non-domestic investors, particularly investment funds, insurance companies, and money market funds, tend to reduce their sovereign bond holdings persistently over several quarters following a geopolitical shock. This pattern is consistent with the view that information asymmetries and the absence of a home-country bias amplify the sensitivity of cross-border holdings to geopolitical uncertainty [Ahearne et al., 2004, Converse and Mallucci, 2025], and aligns with evidence that foreign investors tend to withdraw from euro area sovereign debt markets during stress episodes while domestic investors step in [European Central Bank, 2024]. Domestic investors display more varied behaviour. Banks and investment funds often expand holdings in the medium term, even if their initial response is negative, consistent with a carry-trade motive under zero sovereign risk weights and, in the case of banks, with the reinforcing dynamics of the sovereign-bank diabolic loop [Brunnermeier et al., 2016]. Households show mild but often positive or delayed responses, plausibly driven by retail flight-to-safety reallocation away from riskier assets [Dieckelmann et al., 2024]. Insurance companies and pension funds sometimes increase holdings in the short run but subsequently retrench, in line with their liability-driven investment mandates and the procyclical capital requirements imposed by Solvency II [Bank for International Settlements, 2011, European Central Bank, 2023b]. Money market funds react negatively on impact, particularly among non-domestic entities, consistent with their structural sensitivity to liquidity and credit risk conditions [International Monetary Fund, 2021].

These responses likely operate through two complementary channels. A yield-mediated channel links geopolitical shocks to rising sovereign risk premia, which alter the relative attractiveness of domestic government bonds across investor types: return-seeking investors such as banks and investment funds eventually ex-

pand holdings as spreads widen, while risk-averse, liquidity-constrained investors retrench [Converse and Mallucci, 2023, International Monetary Fund, 2025]. A direct uncertainty channel operates independently of yield movements, elevating risk aversion and triggering portfolio re-composition that is particularly pronounced for investors without a domestic anchor [Dieckelmann et al., 2024]. Both channels interact with country-level fiscal vulnerabilities: the same geopolitical shock generates larger and more persistent disruptions in high-debt countries relative to lower-debt countries [Afonso et al., 2025, International Monetary Fund, 2025].

These findings carry several policy implications. From a fiscal risk monitoring perspective, the composition of the sovereign investor base matters as much as its size: a high share of non-domestic, return-sensitive investors such as investment funds and money market funds increases the vulnerability of sovereign financing to geopolitical shocks [European Central Bank, 2025]. Debt management authorities may need to take investor heterogeneity into account when designing issuance strategies, prioritizing a balanced and stable investor base that includes buy-and-hold domestic institutions capable of acting as market stabilizers during stress [European Central Bank, 2023a]. Finally, macroprudential frameworks may benefit from incorporating investor-type dynamics into stress testing and systemic risk assessments. The procyclical responses of non-domestic funds and the reinforcing feedback between banks and sovereign debt documented here suggest that geopolitical shocks can amplify existing fragilities, particularly in high-debt environments where fiscal and financial vulnerabilities are mutually reinforcing [Brunnermeier et al., 2016, Afonso et al., 2025].

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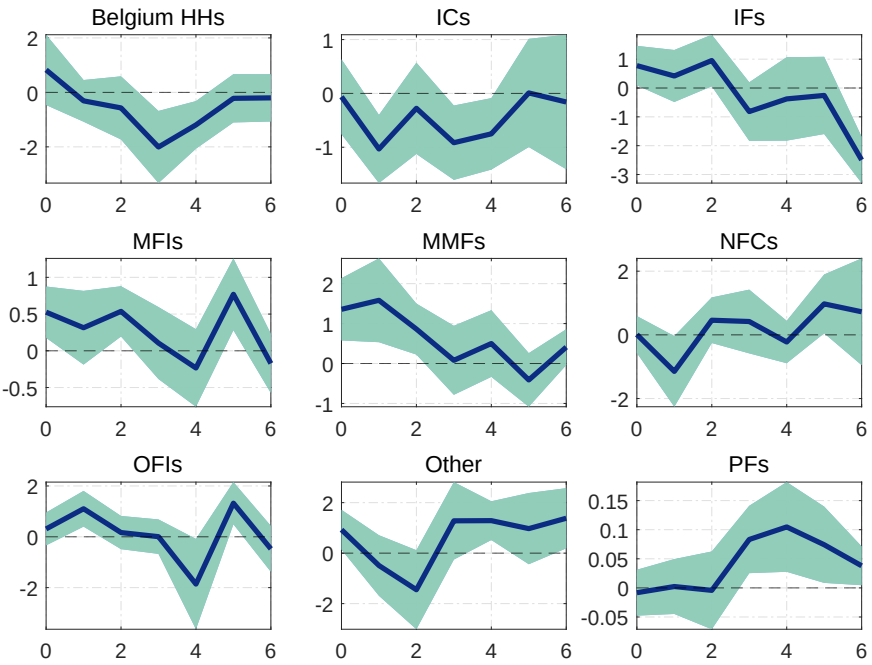
9 Appendix

The appendix presents the corresponding results for domestic and non-domestic investors for different bond maturities based on market value holdings, i.e. the baseline estimation in the paper.

9.1 Results for Domestic Investors in Maturities up to 1 Year

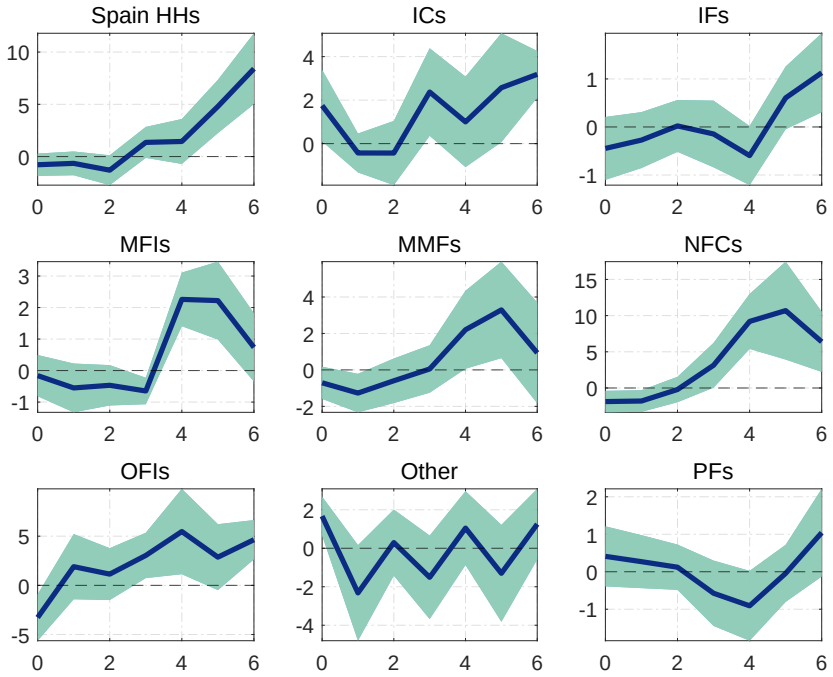
Figures 18 to 21 display the responses of domestic investors holding short term maturity, i.e. bonds up to one year. We observe that French and Belgian households reduce their short term government bond, while Spanish households strongly increase their holdings. Compared to our baseline results above, Belgian households react much stronger, and reduce their short term bonds much more in terms of magnitude. In contrast, Spanish households increase their Spanish short term bonds much stronger after two quarters, approximately. Further, regarding domestic banks, Belgian banks increase their holding, contrary to what we observe in our baseline results. Spanish banks increase their holdings similar to the results in the baseline estimations, however, we observe a much stronger increase in terms of magnitude for short term bonds. Concerning the responses of domestic money market funds, Belgian MMFs increase their holdings similarly as in the baseline estimation. On the other hand, French MMFs reduce their short term bonds holdings much stronger than in the baseline approach. Also similar to the baseline estimation, Italian MMFs display a volatile response over time.

Figure 18: Responses of domestic Belgian sovereign bond holdings to a geopolitical risk shock



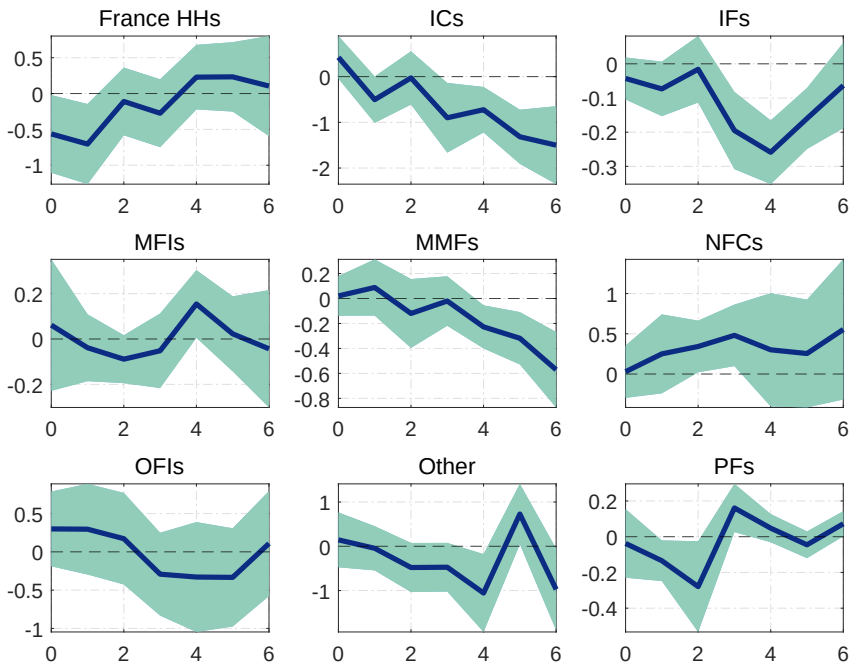
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 19: Responses of domestic Spanish sovereign bond holdings to a geopolitical risk shock



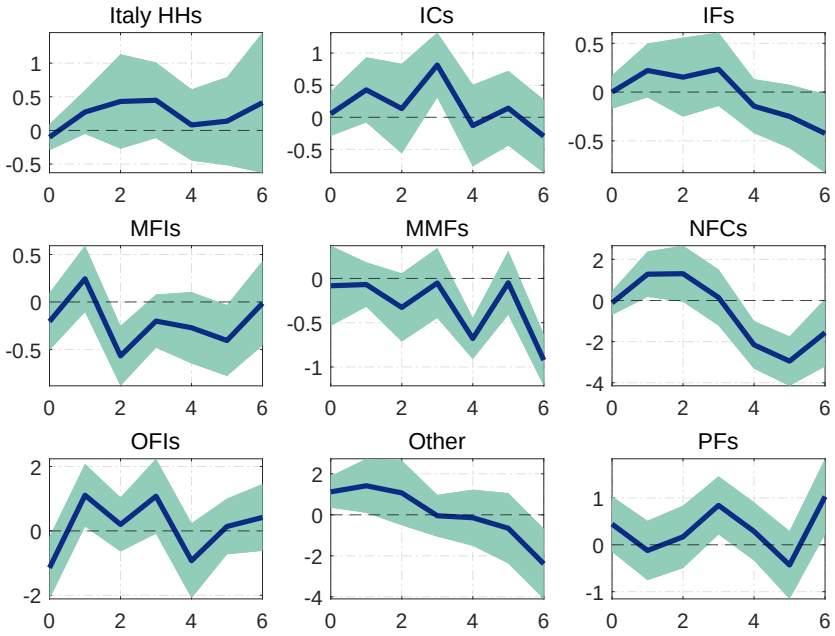
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 20: Responses of domestic French sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 21: Responses of domestic Italian sovereign bond holdings to a geopolitical risk shock



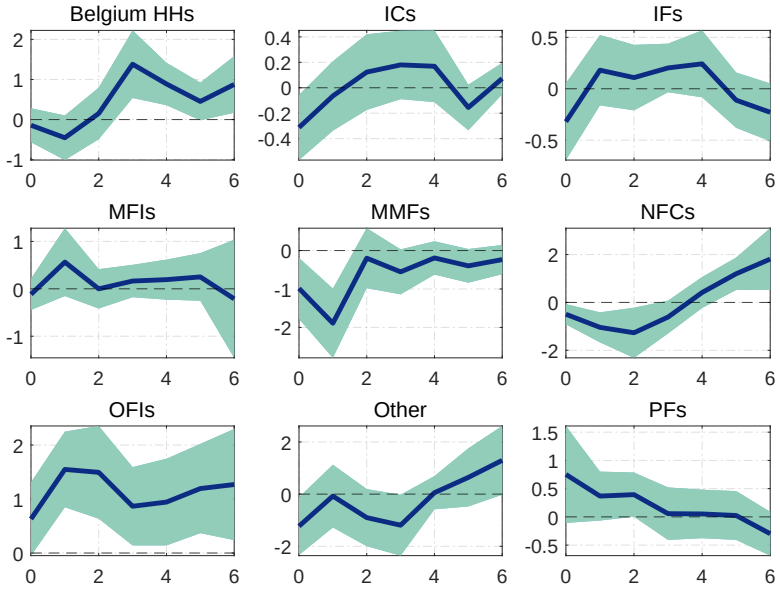
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

9.2 Results for Domestic Investors in Maturities of 1 Year to 5 Years

Figures 22 to 25 display the responses of domestic investors holdings bonds maturities of one to five years. We observe that domestic households increase strongly their holdings, compared to the subsequent reduction in the baseline estimation. Also, domestic non-financial corporations strongly increase their holdings compared to the increase and correction afterwards observable in the baseline results. For Spanish households, a similar result can be observed. They strongly increase

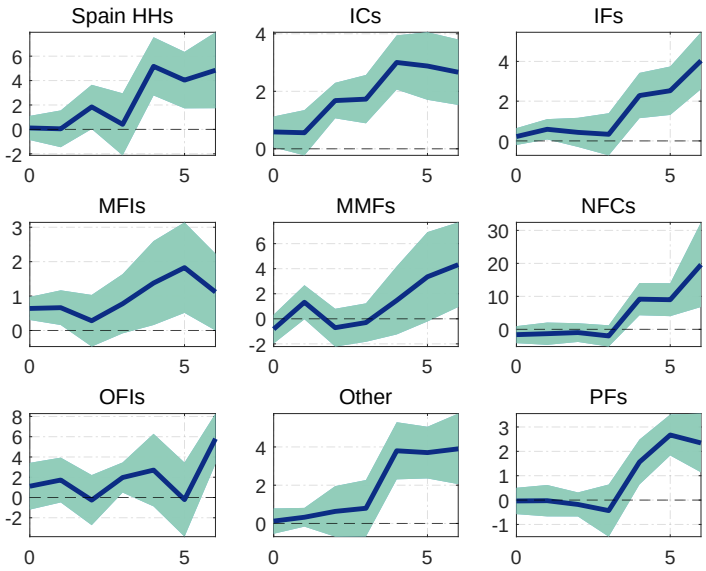
their holdings, much more in terms of magnitude compared to the baseline result. We also observe a gradual yet strong increase of holdings of money market funds. Regarding the response of French domestic investors, we observe that banks as well as investment funds reduce their holdings much more than in the baseline estimation. Finally, regarding Italian investors, we observe that banks as well as money market funds reduce much stronger their holdings.

Figure 22: Responses of domestic Belgian sovereign bond holdings to a geopolitical risk shock



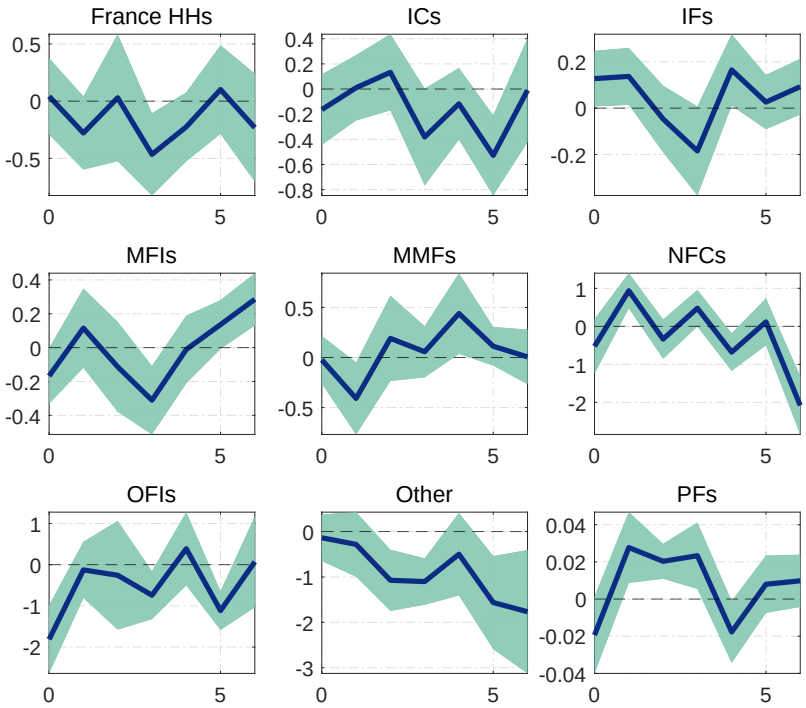
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 23: Responses of domestic Spanish sovereign bond holdings to a geopolitical risk shock



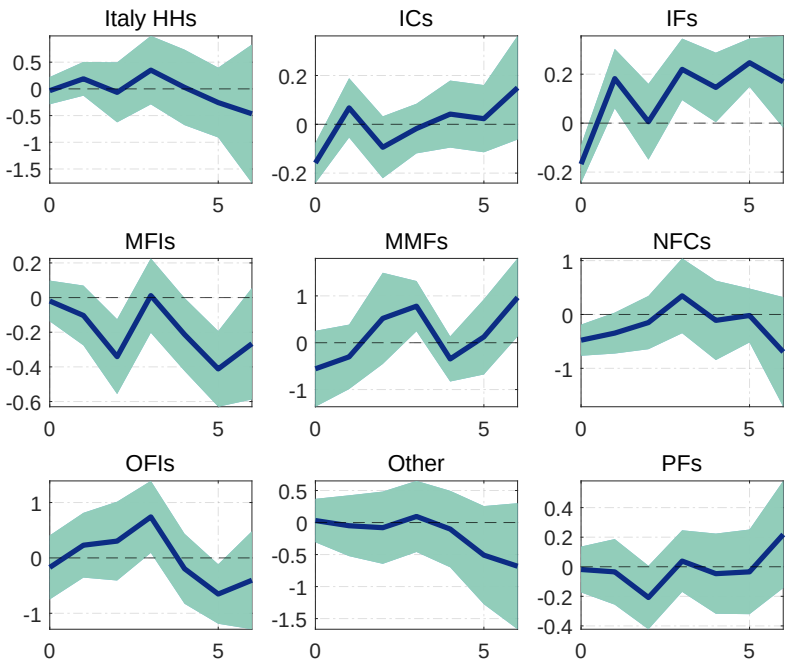
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 24: Responses of domestic French sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 25: Responses of domestic Italian sovereign bond holdings to a geopolitical risk shock



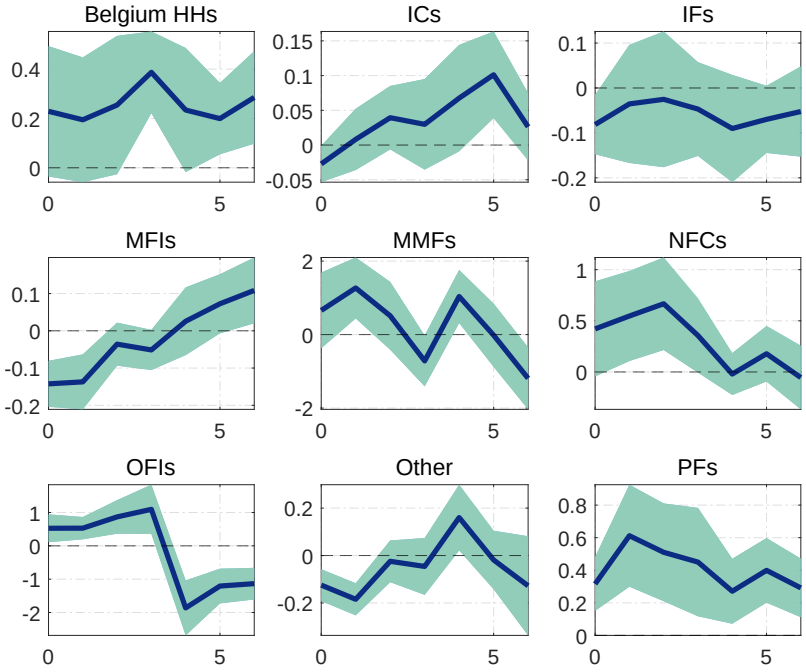
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

9.3 Results for Domestic Investors in Maturities of over 10 Years

Figures 26 to 29 display the responses of domestic investors holding bonds of maturities over 10 years. Similar to the baseline estimations, Belgian banks as well as insurance companies, both display strong increases over time. Also similar as in the baseline estimation, Spanish insurance companies as well as pension funds also reduce their holdings over time. On the other hand, Spanish money market funds increase their holdings much stronger compared to the baseline estimation. Inter-

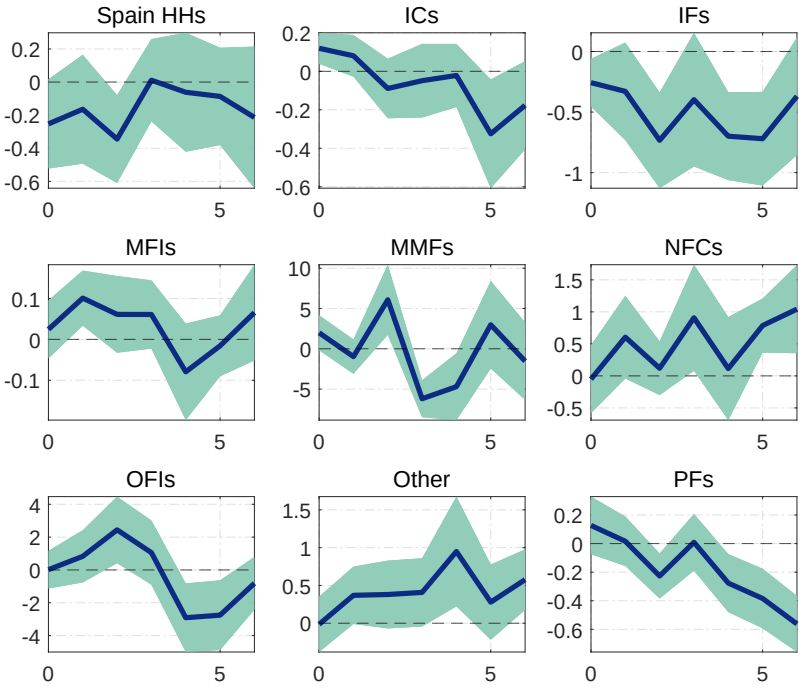
estingly, regarding French investors, both insurance companies as well as banks display almost the same reactions as in the baseline approach. Finally, concerning Italian investors, we observe that money market funds exhibit a much clearer and stronger positive reaction in the first two quarters.

Figure 26: Responses of domestic Belgian sovereign bond holdings to a geopolitical risk shock



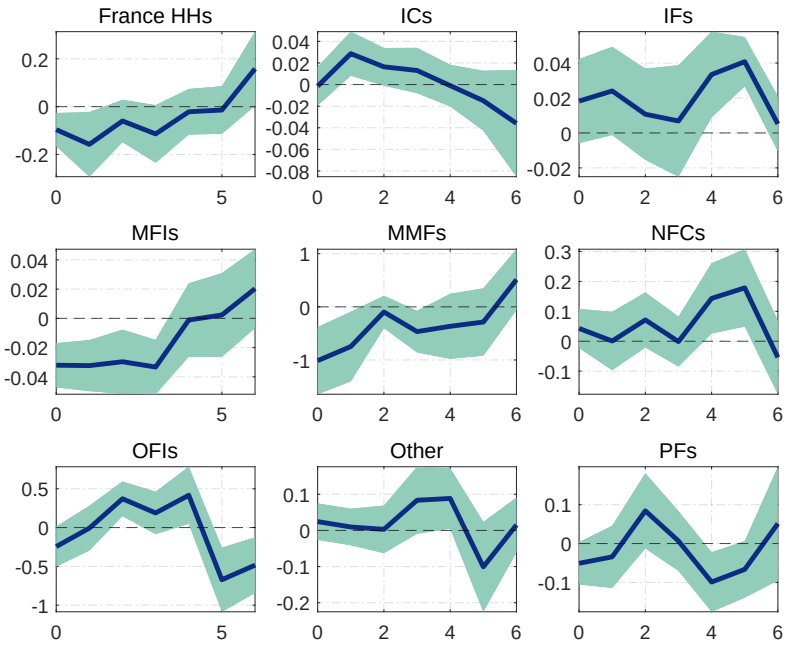
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 27: Responses of domestic Spanish sovereign bond holdings to a geopolitical risk shock



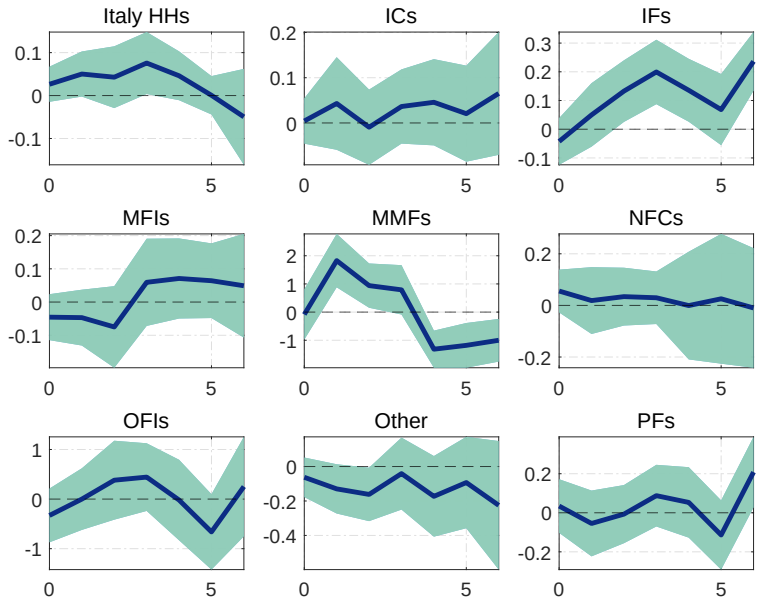
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 28: Responses of domestic French sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 29: Responses of domestic Italian sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

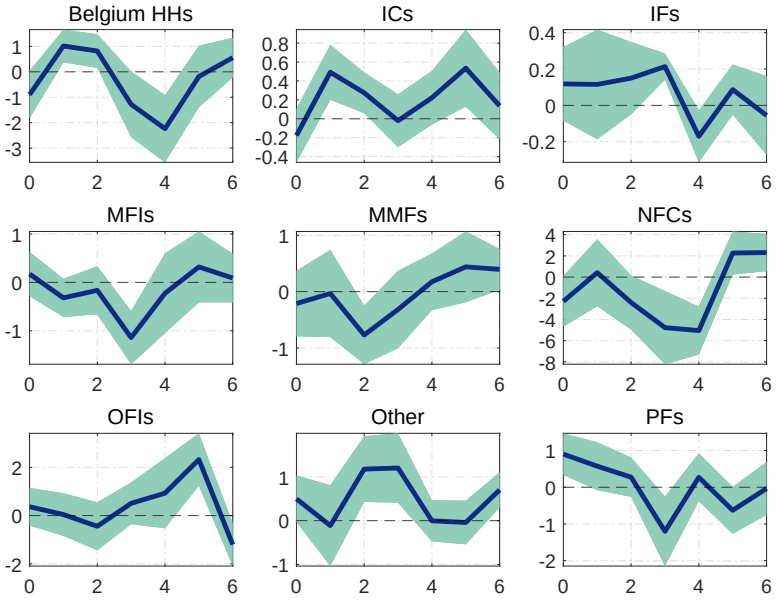
10 Results for Non-Domestic Investors for different Maturities

10.1 Results for Foreign Investors in Maturities up to 1 Year

Figures 30 to 33 show the reactions of euro area non-domestic investors in government bond maturities up to one year. Contrary to the baseline result, we observe that non-domestic households strongly reduce their Belgium short term govern-

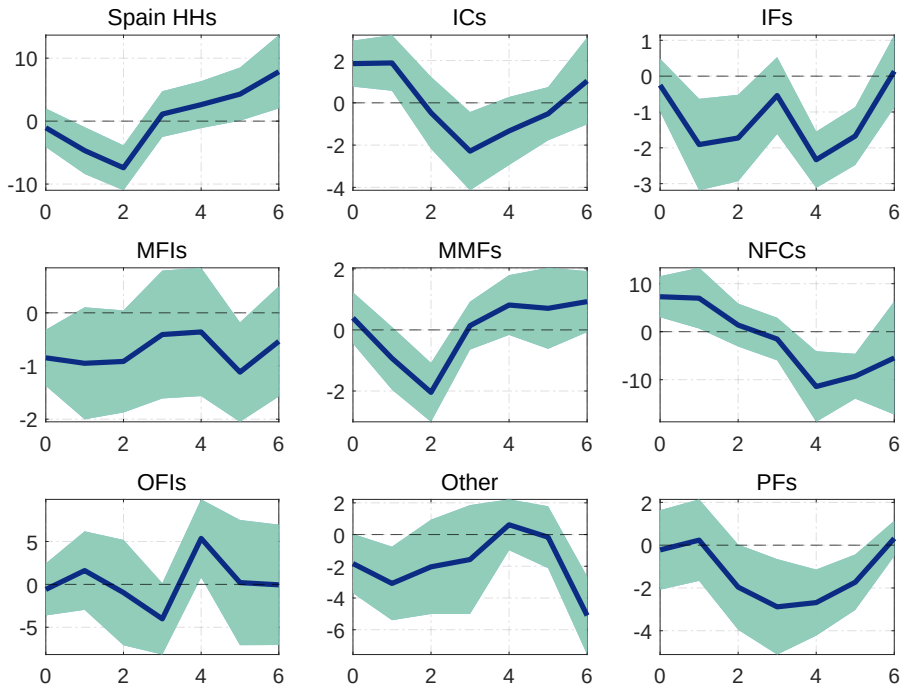
ment debt holdings over the medium term. On the other hand, non-domestic banks reduce more their Belgian government debt holdings in comparison to the baseline result. Further, regarding Spanish government bond holdings, we observe that non-domestic households reduce much stronger their holdings compared to the baseline estimation. Also compared to the baseline estimation, the response we observe by non-domestic insurance companies holding short term Spanish government debt appears ti be stronger. Regarding French government bonds, we observe that non-domestic banks consistently reduce their holdings. Further, non-domestic insurance companies also reduce their holdings, which is consistent with the baseline estimation. Finally, regarding Italian government bonds, we observe that insurance companies also reduce much stronger their holdings compared to the baseline approach.

Figure 30: Responses of non-domestic Belgian sovereign bond holdings to a geopolitical risk shock



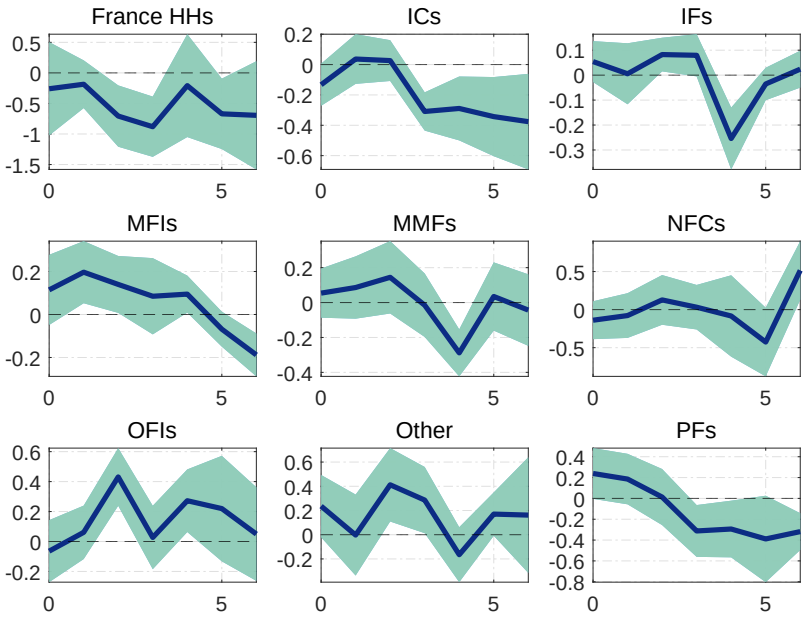
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 31: Responses of non-domestic Spanish sovereign bond holdings to a geopolitical risk shock



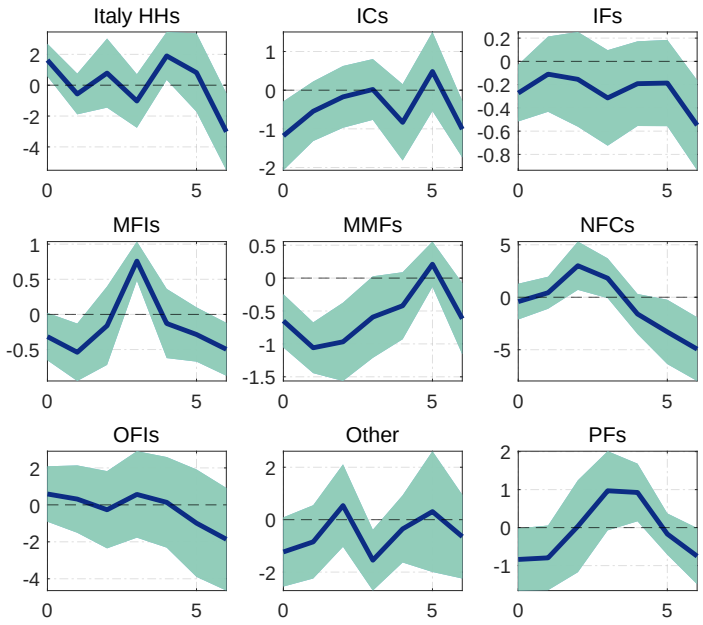
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 32: Responses of non-domestic French sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 33: Responses of non-domestic Italian sovereign bond holdings to a geopolitical risk shock



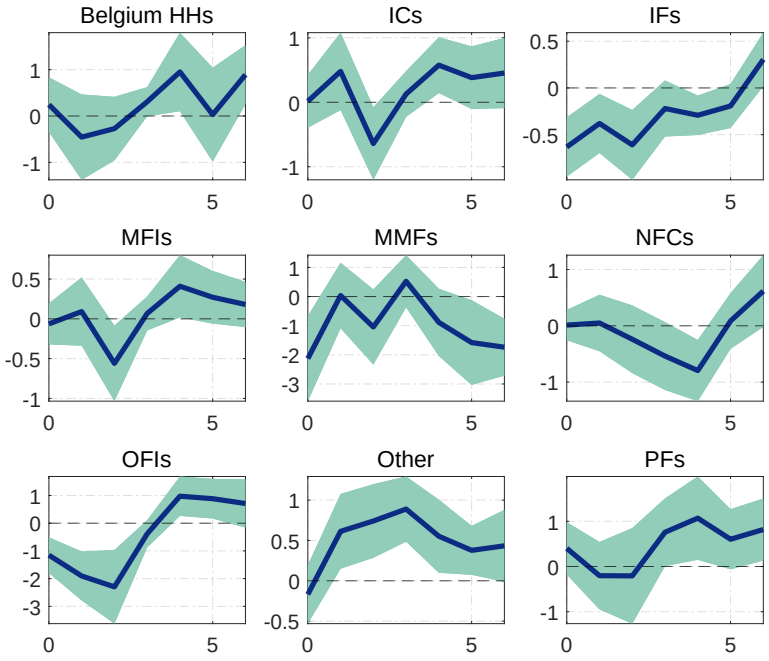
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

10.2 Results for Foreign Investors in Maturities of 1 Year to 5 Years

Figures 34 to 37 show the respective non-domestic investor reactions holding government bonds of maturities 1 to 5 years. Regarding Belgian debt holdings, we observe that investment funds continuously increase their holdings after a strong immediate negative response. Also, non-financial corporations steadily reduce their Belgium government bond holdings, compared to the muted response we

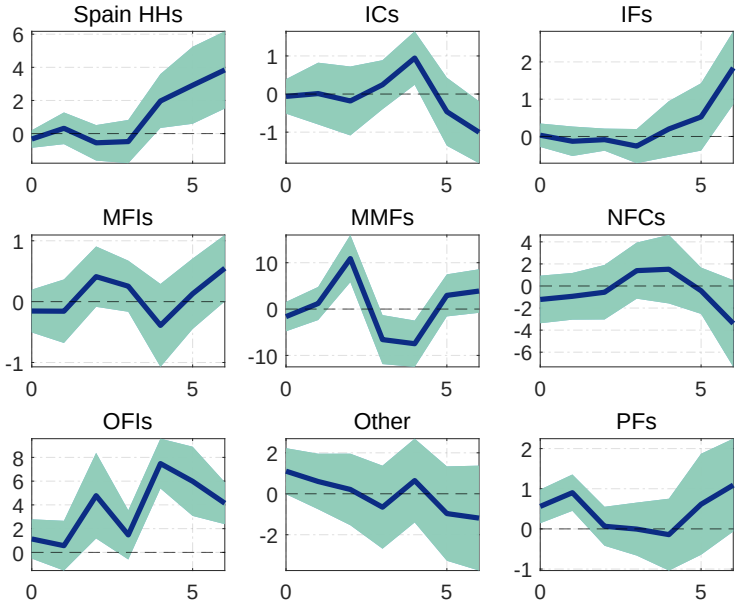
gain in the baseline estimation. Regarding Spanish government bonds, we observe that non-domestic households strongly increase their holdings over time, which is the opposite in the baseline approach. Also contrary to the baseline estimation, we observe that money market funds strongly increase their holdings in the first three quarters. Regarding French government bonds, we observe that non-domestic money market funds steadily increase their holdings after a short-lived immediate reduction. And finally, regarding non-domestic banks' holdings of Italian government bonds, we observe a strong and significant reduction in the first quarter, compared to a rather muted reaction in the baseline.

Figure 34: Responses of non-domestic Belgian sovereign bond holdings to a geopolitical risk shock



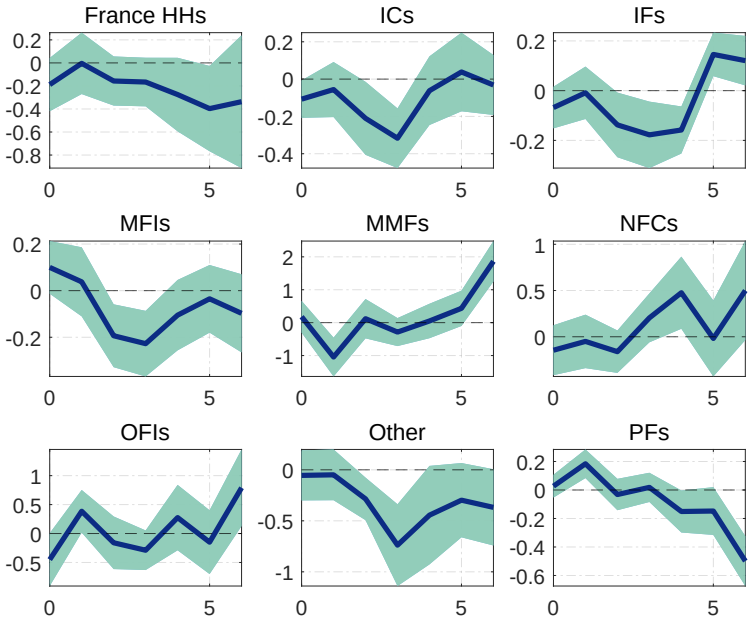
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 35: Responses of non-domestic Spanish sovereign bond holdings to a geopolitical risk shock



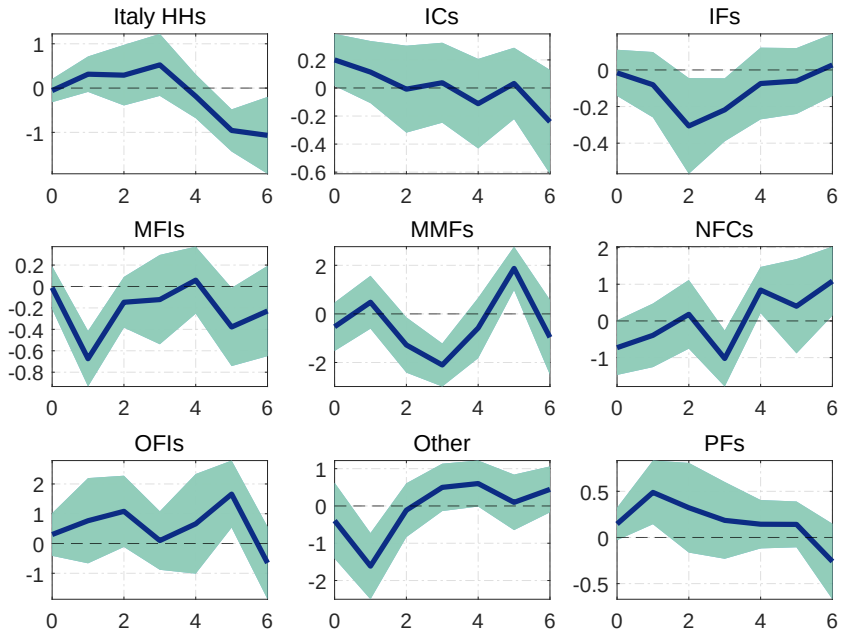
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 36: Responses of non-domestic French sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 37: Responses of domestic Italian sovereign bond holdings to a geopolitical risk shock



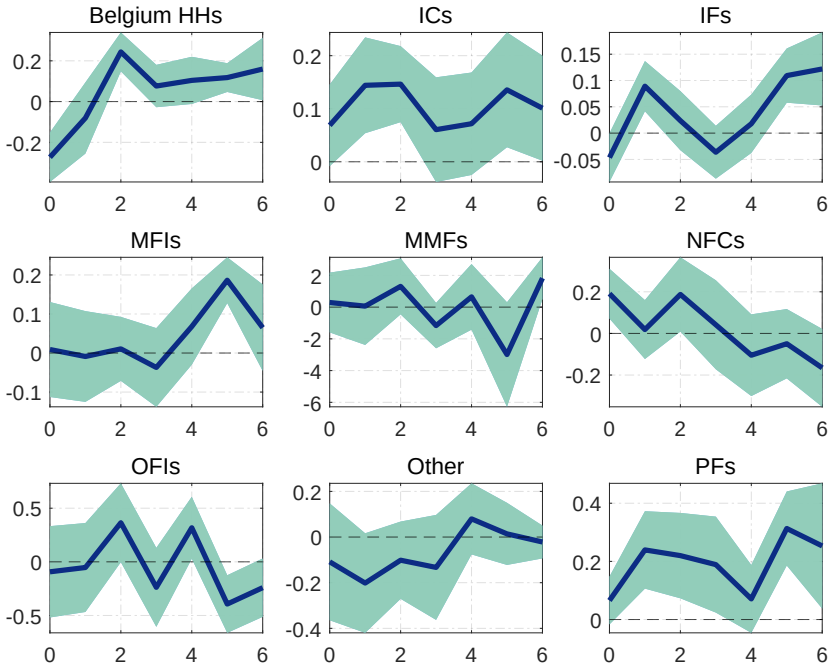
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

10.3 Results for Foreign Investors in Maturities of over 10 Years

Figures 38 to 41 display the responses of euro area non-domestic investors of long term government debt. We observe that non-domestic households as well as investment funds holding Belgian bonds display very similar responses as in the baseline estimations. Also similar to the baseline results are responses of non-domestic insurance companies and investment funds holding Spanish bonds. A similar yet stronger reaction can also be observed in the response of non-domestic banks hold-

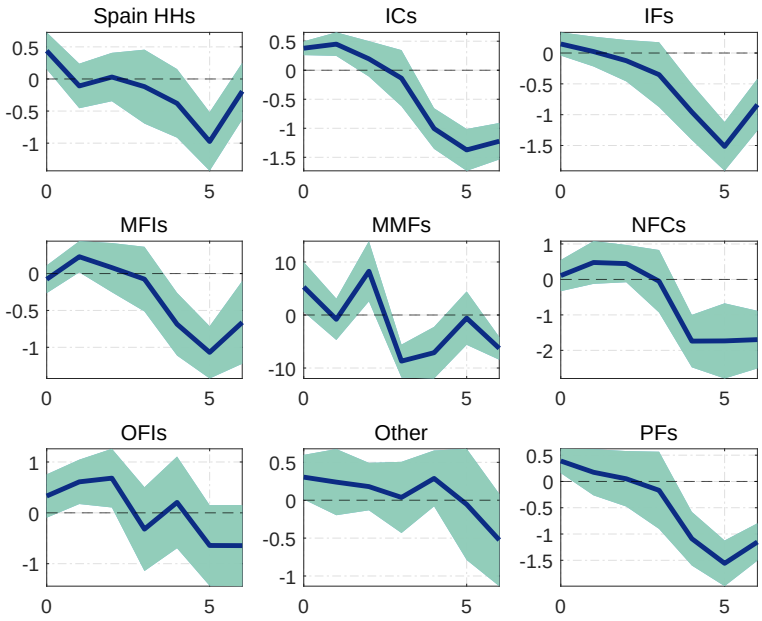
ing Spanish bonds. Regarding the holdings of French government bonds, we also observe that non-domestic insurance companies and investment funds exhibit a similar response as in the baseline estimation. And finally, regarding the holdings of Italian government bonds, we also observe largely muted reactions as in the baseline estimation.

Figure 38: Responses of non-domestic Belgian sovereign bond holdings to a geopolitical risk shock



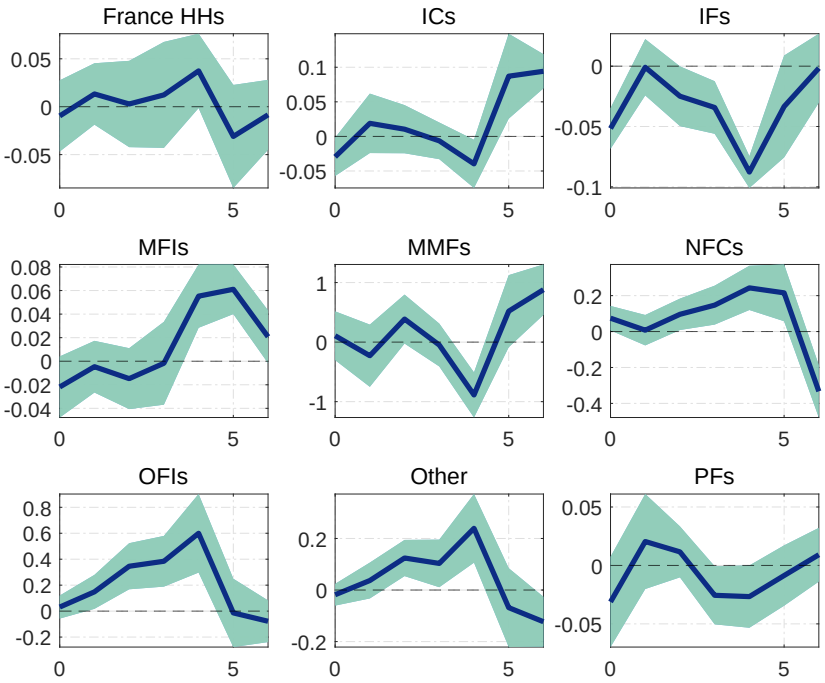
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 39: Responses of non-domestic Spanish sovereign bond holdings to a geopolitical risk shock



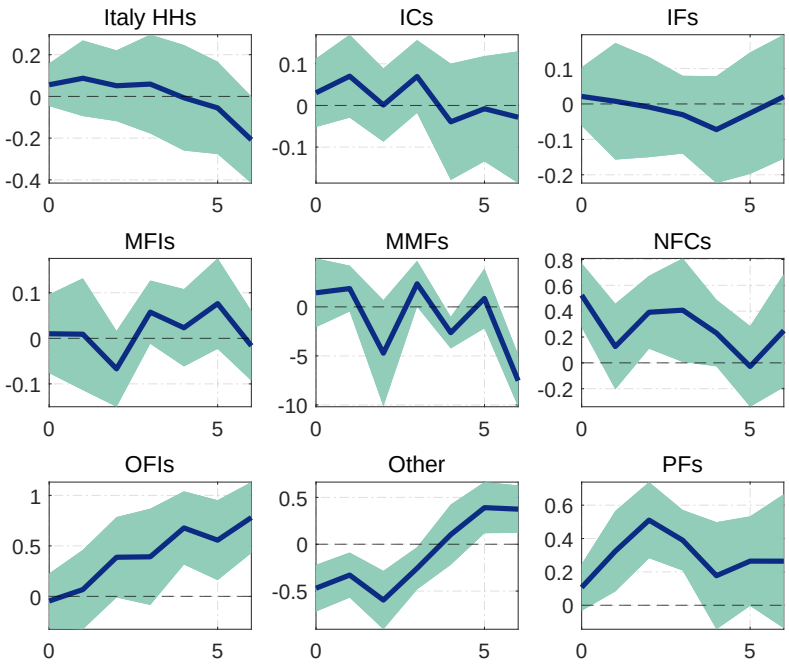
Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 40: Responses of non-domestic French sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

Figure 41: Responses of domestic Italian sovereign bond holdings to a geopolitical risk shock



Notes:The figure shows the estimated β_h coefficients to a GPR shock within 68% confidence bands.

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The views expressed in the paper are those of the authors and do not represent the ECB or the Eurosystem.

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