Geopolitical Risk: When it Matters; Where it Matters. Evidence from International Portfolio Allocations*

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Abstract

Does geopolitical risk lead to financial fragmentation? We answer this question using fund-level data on portfolio allocations of international bond funds. We find that fund managers persistently reduce portfolio weights of countries that are more exposed to geopolitical risk. This is especially true for emerging market economies, and when geopolitical risk is extreme. Financial fragmentation emerges, as portfolios become more concentrated, the number of destination countries drops, and so does the political distance of portfolios relative to the country of residence. End investors also react adversely to geopolitical risk. Net fund flows decline sharply when geopolitical risk increases but recover less than one quarter after the initial shock. Empirical findings are consistent with the predictions of a simple model of delegated portfolio management.

JEL classification: F32, F36, G11, G15, G23.

Keywords: Geopolitical Risk, Mutual Funds, International Capital Flows, Foreign Portfolio Investment, Emerging Markets, Asset Allocation.

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*The views in this paper are solely the responsibility of the authors and should not be interpreted as representing the views of the Board of Governors of the Federal Reserve System or the Central Bank of Ireland.

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1 Introduction

Geopolitical risk is front and center in the policy and academic debate these days. Russia's invasion of Ukraine and the armed conflict in the Middle East have sent geopolitical risk indices to the roof and have directed the attention of policy markers and researchers on the economic consequences of rising geopolitical tensions. Economic fragmentation, in particular, has received special attention. New terms such as "friendshoring" or "nearshoring" have been created to describe processes by which firms may reshape their value chains to mitigate reduce their exposure to geopolitical risk. Concerns have emerged that economic fragmentation may reduce growth, disrupt trade, lead to higher and more persistent inflation, and reduce the ability of economies to absorb regional and global shocks (Fernández-Villaverde et al., 2024). Surprisingly, much less work has been devoted to financial fragmentation with some notable exception, such as Niepmann and Shen (2024) who study how global banks react to geopolitical risk and transmit it, and Choi and Havel (2025), who study of how portfolio flows are affected by geopolitical risk using aggregated data from the United States.[1] In this paper we fill the gap analyzing micro-level data on the portfolio position of international bond funds, and document how fund managers and end investors react to geopolitical risk.

Our main data sources are two. First, we get our measures of geopolitical risk from Caldara and Iacoviello (2022). In particular, we use both their global geopolitical index, that measures geopolitical risk at the world level, and their country specific geopolitical risk indices, that measure the exposure of each country to geopolitical risk. Second, we get our data on international mutual funds from EPFR Global, which releases monthly data containing information on injections into fund and portfolio allocations. Merging the two sets of data, we get granular information on how geopolitical risk affects the portfolio decision of fund managers, and the flow of money into international funds.

We find that in normal times an increase in geopolitical risk in a country triggers a modest decline of the portfolio weight of that country. That said, the impact is persistent and grows bigger over time reaching its peak about 10 to 12 months after the initial shock. When geopolitical risk is high,it rises to become a prominent driver of portfolio dynamics, triggering sizable portfolio reallocations. When we look at cross-country heterogeneities, we find substantial differences between advanced economies and emerging markets. The

[1] Two related paper are Aiyar et al. (2024) and Catalan et al. (2024). Aiyar et al. (2024) study the impact of geopolitical risk on foreign direct investment, while Catalan et al. (2024) assesses how geopolitical alignment affects investor portfolios.

portfolio weights of advanced economies inch up when geopolitical risk increases. Portfolio weights of emerging markets instead decline in response to same shock. Portfolio weights of Emerging European, Middle-Eastern, and African countries are especially sensitive to geopolitical risk, and the portfolio weight of those countries decline sharply in response to an increase in risk. Political alignment also matters, portfolio weights of countries that belong to NATO are generally less sensitive to geopolitical risk.

Geopolitical risk leads to financial fragmentation. When global geopolitical risk increases, funds' portfolios become more concentrated, the number of destination countries drops, and cash holdings increase. The political distance of the portfolio relative to the country of residence also declines. Taken together these findings indicate that funds becomes less diversified when geopolitical risk increases.

Finally, we find that end investors also react adversely to geopolitical risk. They reduce aggressively net flows to a fund when that fund becomes more exposed to geopolitical risk. However, the impact is short lived, as it only last for about a quarter.

Our paper relates to at least two strands of the literature. First, it relates to the literature on geopolitical risk and their consequences to the economy. We obtain our measure of geopolitical risk from Caldara and Iacoviello (2022), who examine its effects on macroeconomic and firm-level outcomes in the U.S. In a more recent work, Caldara et al. (2024) employ their measures of geopolitical risk to the estimate the impact of geopolitical tensions on inflation. Federle et al. (2024) estimate the impact of wars on growth for belligerent countries and neighboring countries. Fernández-Villaverde et al. (2024) develop an index of fragmentation and investigate the causal effect of geopolitical fragmentation on key economic variables, such as GDP, industrial production, investment, and stock prices. Fajgelbaum et al. (2020); Bianchi and Sosa-Padilla (2023); Lorenzoni and Werning (2023); Amiti et al. (2020); Alfaro and Chor (2023); Crosignani et al. (2024) among others study the macroeconomic impact of geopolitical fragmentation. Niepmann and Shen (2024) provide evidence that geopolitical risk propagates through banks. In a closely related paper, Choi and Havel (2025) find that country-specific GPR depresses capital flows from the U.S. to emerging markets. Our paper contributes to this literature, quantifying the impact of geopolitical risk on the behavior of an important class of cross-border investors.

Second, our paper relates to the literature on the determinants of mutual funds portfolios. The literature has shown that returns are an important driver of portfolio dynamics. Broner et al. (2006), for instance find that when funds underperform, they shift their portfolio weights to more closely resemble the average weights of other funds. Raddatz and Schmukler (2012) find that bond fund managers rebalance in response to changes in returns, dampening changes in weights due to asset price fluctuations, but reducing portfolio weights when a country enters a crisis. In a recent paper, Camanho et al. (2022) show that funds rebalance their portfolios to offset changes in foreign share driven by valuation gains and losses. However, more recently, researchers have begun to unpack the determinants of returns to pin down how each component of the returns affects the portfolio allocation. Gelos and Wei (2005) for instance studies how transparency affects portfolio allocations, while Maggiori et al. (2020), Hassan et al. (2023), and Converse and Mallucci (2023) study how the currency denomination, country risk, and sovereign risk affect portfolio allocations. Our paper contributes to this literature showing when and where geopolitical risk matters to determine portfolio allocations.

2 Data

Our dataset merges information on geopolitical risk with data on the portfolio of mutual funds . Data on geopolitical risk are taken from Caldara and Iacoviello (2022), who construct an index to measure geopolitical risk. The index is built using news published in leading newspapers in Canada, the united States, and the United Kingdoms. The index measures the number of news articles mentioning geopolitical risk as a fraction of total news articles being published. As the index is built using North American and British news paper, the index can be interpreted as a measure that is relevant for major companies, investors, and policymakers. The index is also available at the country level, measuring the different exposure of countries to geopolitical risk. In this paper we will make use of both the country-specific geopolitical indexes and the global one. We use the country-specific geopolitical indexes to understand how fund managers rebalance their portfolios when a country's exposure to geopolitical risk changes. We then use the global geopolitical index to understand whether fund managers' investment decisions change when global geopolitical risk is high.

For data on the portfolio-allocation decisions of investors, we rely on the "Country Allocations" dataset published by the commercial data provider EPFR Global. The portfolio-allocations data are collected by EPFR directly from funds themselves, supplemented with and checked against publicly available data.[2] The dataset contains information on the cross-

[2]Importantly, none of the fund-level allocations are estimated by the data provider; funds not reporting allocations (but that report, for example flows and total assets to EPFR) are absent from the dataset. It

country asset allocations of just over 700 bond mutual funds beginning in July 2002.[3] Crucially, EPFR Global is the only data source that provides fund-level allocation data at a *monthly* frequency. This feature is especially important, as we focus on geopolitical risk that can escalate quickly. Lower-frequency data on portfolio allocations, such as the quarterly data published by Morningstar, may miss important features of the subsequent investor reaction.[4] Additionally, the EPFR dataset is free of survivorship bias. This is important for our analysis because, for example, funds that increase their holdings of a country's assets when geopolitical risk increases might be more likely to fail.

To clean the dataset, we begin by dropping funds that report allocations for less than 12 months as well as funds with less than $10 million in assets. We also exclude from our analysis funds with extremely high or low values for monthly inflows or aggregate fund returns, dropping funds in the top and bottom one percent of the distribution for either of these variables. Data from passive funds are also eliminated, as we are interested in understanding how fund managers react to geopolitical risk. We also limit our sample to funds domiciled in anglophone countries or in Luxembourg.[5] As it was mentioned above, the geopolitical index by Caldara and Iacoviello (2022) is built using North American and British newspapers, and should be interpreted as a measure of geopolitical risk that is relevant for major companies and anglophone investors. Hence we remove data for funds that are neither domiciled in an anglophone countries nor domiciled in Luxembourg.[6]

The data cleaning leaves us with data on 1,903 actively funds domiciled in eight countries, of which 491 are bond funds and 1,412 are equity funds. Just over half the funds in the sample are domiciled in Luxembourg and nearly 30 percent in the United States.

Figure 1 provides an overview of the aggregate portfolio of the bond funds in the dataset.

is possible that managers could inaccurately represent their country positions to commercial data providers like EPFR (Chen et al., 2021), but the fact that EPFR checks reported positions against publicly available data constrains such misreporting.

[3]Note that EPFR also provides data on the assets, flows, and returns of roughly 7,200 bond mutual funds that have a mandate that restricts their investment portfolio to a single country. Since the managers of these funds do not face an international portfolio choice problem, we do not include them in our analysis.

[4]Raddatz and Schmukler (2012) show that analyzing bond fund reallocation at lower frequencies misses roughly half of the response to changes in returns.

[5]The Anglophone domicile countries in our sample are the United States, UK, Canada, Ireland, Australia, the Bahamas, the Cayman Islands, and Guernsey.

[6]Table 8 in the Appendix shows how the results of our baseline regression change depending on the domicile of the funds. We find that funds that are domiciled outside anglophone countries and Luxembourg (column 6) do not respond to variations of the geopolitical risk index, confirming the assumption that the geopolitical index we adopt may not be relevant for funds that are neither anglophone nor located in major financial centers.

At the end of 2019, the funds in the dataset held $580 billion in assets. In the left panel of Figure 1, we see that roughly half of the assets held by the funds in the dataset are bonds issued in the U.S. and Europe, while bonds issued in emerging markets account for a further third of the fund assets in the sample. Note that on average six percent of the fund assets in our sample are held in cash, with the cash share increasing in times of financial stress such as during the Global Financial Crisis and following China's surprise currency devaluation in the summer of 2015.

The right panel of Figure 1 plots the assets of the funds in our sample broken down according to the legal domicile of the funds. Around 45 percent of the funds in the sample are domiciled in the United States. Unsurprisingly, given their role as international financial centers, Luxembourg and Ireland account for a combined 40 percent of fund assets.[7] Complete summary statistics on the portfolio shares of the funds in our sample are provided in the Appendix.

How do the funds in our sample compare to the universe of mutual fund assets? While there is no single definitive source for data on the assets of international mutual funds *worldwide*, we are able to compare the assets of the funds in our sample that are domiciled in Luxembourg, Ireland, and the U.S. with the universe of assets of international mutual finds domiciled in those countries.[8] The funds in our dataset account for 35 percent of the universe of international mutual fund assets in these three countries, indicating that our sample is large enough to be representative of the bond mutual fund industry as a whole.[9] And since together Luxembourg, Ireland, and the U.S. account for more than 90 percent of worldwide mutual fund assets, this comparison provides a meaningful view of our sample coverage worldwide.

And how large are the funds in our sample relative to the international bond markets in which they participate? Assets held by funds in the dataset amount to 1.8 percent of foreign-held bonds issued by the countries in our sample[10]. This overall share is low because

[7]The sharp 2014 increase in the fund assets invested in European bonds along with a similar jump in the assets of funds domiciled in Europe, represents an improvement in the coverage of the EPFR dataset.

[8]Data on the universe of international mutual funds come from the Banque Centrale du Luxembourg, the Central Bank of Ireland, and the U.S. Investment Company Institute. Recall that we use the term *international* mutual funds to refer to funds that invest outside the country of their domicile.

[9]The sample that we use for estimation in Sections 5 is smaller, accounting for 18 percent of total fund assets in these three countries, because it excludes single-country funds and passively managed funds, as managers of these two types of funds do not make the type of cross-country portfolio-allocation decisions that are the focus of this paper. However, data on the universe of actively managed, multi-country funds (the specific type of funds that make up our estimation sample) are not publicly available.

[10]Data on bonds held by foreigners discussed in this paragraph come from the international investment

mutual funds with a multi-country mandate hold a very low share of bonds issued in large developed markets. For emerging markets, the funds in our sample account for roughly six percent of the bonds held by foreigners overall. The share is substantially higher for some individual emerging markets, such as Russia (16 percent), Thailand (14 percent), and Brazil (11 percent). Thus while the funds we analyze represent a subset of global investors, they are nonetheless an important subset. At the same time, the share of bonds outstanding held by funds in our sample is sufficiently low that it is very unlikely that the portfolio allocation decisions of the funds in our sample drive movements in CDS prices. We address this issue in more detail in the next section, where we discuss our identification assumptions.

EPFR Global also provides information on the mandate of the funds in our sample. In this paper, we make use of two aspects of the mandate information: the sector of the funds' investments and the currency. Nearly half of the 656 funds in our sample have a sector-specific mandate. Of those, just over half invest only in sovereign bonds, while corporate bond funds are evenly split between investment grade and high yield. For the emerging market funds in our sample, a key feature of the fund mandate is whether the fund is permitted to invest in local currency-denominated bonds or instead is limited to so-called hard currency bonds, meaning those denominated in U.S. dollars, euros, yen, or some other major currency. More than half of the emerging market funds in the sample hold only hard currency assets, while 30 percent are dedicated local currency funds. The remainder of the emerging market funds invest in both types of bonds. However, local currency funds are on average larger and thus actually account for a larger share of the assets of the funds in our sample than do hard currency funds.

We merge the portfolio-allocations data with the geopolitical risk variables from Caldara and Iacoviello (2022), creating a fund-country-date monthly panel. In analyzing this dataset, we must decide how to treat zero values for funds' country portfolio weights. While some zero weights represent an actual decision on the part of the fund manager not to hold bonds issued by a country's residents, the majority of zeros in the sample simply reflect restrictions imposed by the fund's mandate. For example, most Latin America funds have zero portfolio weights on Asian countries. Consequently, we treat zeros as "true" zeros only if the country has a non-zero portfolio weight at some point during the life of the fund. If the fund has never had a non-zero portfolio weight for a country, we record the associated fund's portfolio weights for that country as missing. Thus, our final dataset is a three-way fund-country-month panel with 2,403,126 individual observations. Our final dataset excludes passively

position section of the IMF's Balance of Payments Statistics.

managed funds because we are interested in how portfolio allocations change in response to sovereign risk, and the allocations of passively managed funds by construction will not.

3 Empirical Methodology

Our empirical methodology follows Converse and Mallucci (2023) and Raddatz and Schmukler (2012). The law of motion of the portfolio weight w_{ijt} that fund i assigns to country j at time t writes:

$$w_{ijt} \equiv w_{ijt-1} \frac{R_{ijt} + f_{ijt}}{R_{it} + f_{it}}. \tag{1}$$

The portfolio weight increases if R_{ijt}, the gross returns on fund i's assets in country j, is larger than R_{it}, the gross return on the fund's total portfolio, or if f_{ijt}, the net flow of money from fund i to country j, is larger than f_{it}, the net flow of money into the fund from end investors.

We log-linearize equation (1) to obtain:

$$\omega_{ijt} = \omega_{ijt-1} + (r_{ijt} - r_{it}) + (f_{ijt} - f_{it}) + \epsilon_{ijt}. \tag{2}$$

ω_{ijt} is the log of the portfolio weight of country j at time t in fund i, r_{ijt} is the net return on fund i's investment in country j, and f_{ijt} is the net flow of money from fund i to country j. The term ϵ_{ijt} captures the approximation error from the log linearization.

Following Raddatz and Schmukler (2012), we allow relative flows $(f_{ijt} - f_{it})$ to depend on lagged portfolio weights and relative returns. Additionally, as we want to study the impact of geopolitical risk on international portfolio positions, we also include the country's j geopolitical risk index $GPRC_{jt}$ in the relative flows equation:

$$f_{ijt} - f_{it} = \delta\omega_{ijt-1} + \phi\,(r_{ijt} - r_{it}) + \gamma GPRC_{jt} + \psi_{ij} + \theta_t + \nu_{ijt}. \tag{3}$$

The term ψ_{ij} is a destination country-fund fixed effect, capturing the fact that a particular fund manager may on average have a preference for investing in certain countries because of, for example, the fund's particular benchmark.[11] We also include time fixed effects θ_t.

[11] To the extent that benchmark weights change relatively little over time, this fixed effect would also capture their effect. As we describe in Section B.1, our results also hold when we explicitly control for benchmark weights, as in Gelos and Wei (2005) and Forbes et al. (2016).

Finally, ν_{ijt} is the error term.

Plugging equation (3) back in (2), we obtain our baseline regression specification:

$$\omega_{ijt} = \beta\omega_{ijt-1} + \zeta\left(r_{ijt} - r_{it}\right) + \gamma GPRC_{jt} + \psi_{ij} + \theta_t + \nu_{ijt}, \tag{4}$$

where $\beta \equiv 1 + \delta$, and $\zeta \equiv 1 + \phi$. Our main coefficient of interest is γ. It measures how the manager of fund i modifies the portfolio weight of country j when geopolitical risk in country j increases.

In our analysis, we are often interested in heterogeneous effects. That is, we want to understand whether fund managers' attitude toward geopolitical risk changes according to specific characteristics of the fund, the historical period, or the destination country. To identify heterogeneous effects, we augment our baseline regression to include an interaction terms between our geopolitical risk variable, and the variable Z_{ijt} capturing the specific characteristic. Our regression equation thus becomes:

$$\omega_{ijt} = \beta\omega_{ijt-1} + \zeta\left(r_{ijt} - r_{it}\right) + \gamma GPRC_{jt} + \gamma_1 Z_{ijt} * GPRC_{jt} + \gamma_2 Z_{ijt} + \psi_{ij} + \theta_t + \nu_{ijt}. \tag{5}$$

Coefficient γ_1 tests for the existence of heterogeneous effects. When γ_1 is significant, fund managers attitude towards geopolitical risk is influenced by the characteristic measured by Z_{ijt}.

Our *identifying assumption* is that portfolio reallocations do not affect geopolitical risk. That is, we assume that changes intfolio allocations of international investors do not change the the exposure of a countrytry to geopolitical risk. This assumption seems very plausible. Geopolitical events such as war or terrorist attacks are unlikely to be driven by the investment decisions of portfolio managers. The omitted variable bias is instead a greater source of concern. The specification in equation (4) is relatively parsimonious, with relative returns being the only explicit control variable. However, fund-country fixed effects ensure that no cross-sectional country or fund characteristics generate omitted variable bias.[12] Similarly, our inclusion of a full set of time fixed effects controls for all factors that vary over time but not across countries. This leaves factors that vary over time within individual countries as

[12]Because funds' portfolio weights are correlated with unobservable manager preferences, omitting the fund-country fixed effect or estimating the model in differences would generate inconsistent estimates. However, since equation (4) is a dynamic panel model, estimating coefficients using least squares is also asymptotically biased, with a bias of the order of $1/T$, where T is the length of the time series of the typical fund. In our sample T is relatively large: 40 observations for the average fund. Hence, the least-squares estimation of Equation (4) performs well relative to alternatives such as GMM (Judson and Owen, 1999).

the only potential sources of omitted variable bias. In Section B.1 we show that the inclusion of such variables has a negligible impact on our estimates of γ, suggesting that the omitted variable bias is not distorting our results.

Ideally, we would like to estimate our regression using the return r_{ijt} of each fund's particular security holdings in each country. However, the EPFR database from which we draw our allocations data does not provide information at the security level. Consequently, when we analyze portfolios of bonds, we approximate r_{ijt} with r_{jt}, the average returns on bonds issued in each country. Similarly, when we analyze equity portfolios, we approximate r_{ijt} with the average total returns r_{jt} of equities issued in each country. For emerging markets in the dataset, we use country-specific JPMorgan EMBIG Total Return Indexes to approximate average bond returns and MSCI indexes to approximate equity returns.[13]. For developed markets, we use the JPMorgan GBI to approximate bond returns, and MSCI for equity returns. In all regressions, we correct for the heteroskedasticity by clustering the error terms at the fund level. As we approximate country-level returns with returns of an aggregate index, we introduce a measurement error in the excess return variable $(r_{ijt} - r_{it})$. As shown by Griliches (1986), the sign of the resulting bias depends on the sign of the coefficient on the variable measured with error, in this case $(r_{ijt} - r_{it})$, as well as the correlation between $(r_{ijt} - r_{it})$ and Z_{ijt}. Theoretical studies, previous work (Raddatz and Schmukler, 2012; Converse and Mallucci, 2023), indicate that $(r_{ijt} - r_{it})$ is positive, and the correlation between geopolitical risks and returns is unambiguously positive. As a result, the measurement error arising from our use of an aggregate index will tend to bias our estimate of γ towards zero, which works against our finding of a significant negative relationship between geopolitical risk and portfolio weights.

4 Geopolitical risk and Portfolio Weights

In this section, we use granular data on portfolio allocations to analyze how the portfolio weight of a country is affected by the exposure to geopolitical risk of that country. We reach the following conclusions. Exposure of a country to geopolitical risk has a negative, significant, and modest impact on the portfolio weight of that country. The impact is persistent and grows over time, reaching its peak about 10 to 12 months after the initial shock. Portfolio weights of EMEs, especially those that do not belong to NATO, are more

[13]Once again, we follow Raddatz and Schmukler (2012) to approximate country returns in this way.

affected by geopolitical risk. Finally, the level of geopolitical risk matters. When geopolitical risk is elevated, investors adjust portfolio weights more aggressively.

4.1 Where it Matters

The Intensive Margin

Table 1 reports our baseline results for bond funds. In line with previous work (Raddatz and Schmukler, 2012; Converse and Mallucci, 2023), We find that the coefficients of lagged weights and relative returns are positive and significant, indicating that country weights are high when past country weights are high and that fund managers increase their holdings of assets that pay higher returns. Turning to our main variable of interest and focusing on column (1), we find that the coefficient of geopolitical risk is negative and significant. Fund managers reduce the portfolio weights of a country, when the country's exposure to geopolitical risk increases. This finding also suggests that yields do not fully compensate managers for geopolitical risk, since the coefficients of both geopolitical risk and excess returns are statistically significant. The economic impact is modest. The estimated value of the γ coefficient implies that fund managers reduce their exposure to country j by 1.0 percent when the geopolitical risk index of country j increases by one standard deviation. The baseline regression in column (1) is estimated pooling data for advanced economies and emerging markets. Column (2) unpacks the heterogeneous response of portfolio weights of emerging markets and advanced economies to an increase in geopolitical risk. Non-US AE is a dummy variable that is equal to one when the destination country is an advanced economy excluding the United States. EME is a dummy that is equal to one when the destination country is an emerging market. The coefficient γ for the geopolitical risk variable captures how portfolio managers modify the portfolio weight of the United States when its exposure to geopolitical risk increases. We find that the coefficient is positive and significant, indicating that the portfolio weight of the United States increases as geopolitical risk increases. This result may look counterintuitive at first. However, it is line with the finding that international investors rebalance their portfolios towards advanced economies in crises periods, even when crises originate from advanced economies (Caballero and Simsek, 2020; Alberola et al., 2016; Jeanne and Sandri, 2023; Broner et al., 2013). The coefficient of the interaction term between the geopolitical risk variable and the dummy variable that identifies advanced economies other than the United States is not significant, indicating that fund managers adjust portfolio weights of advance economies in the same way as they adjust the portfolio weights of the

United States when exposure of these countries to geopolitical risk increases. The interaction term between geopolitical risk and the dummy variable for emerging markets is, instead, negative and significant, indicating that fund manager reduce portfolio weights of emerging markets more aggressively than the portfolio weight of the United States when these countries become more exposed to geopolitical risk. The sum of the coefficients for the geopolitical risk variable and the interaction term is negative and significant. This finding indicates that fund managers reduce the portfolio weight of emerging market countries whenever exposure to geopolitical risk increases in those countries. The economic magnitude of the result is modest. For EMEs, a one standard deviation increase in geopolitical risk translates into a 1.3% decline of portfolio weights, or about 5% of the standard deviation of portfolio weights. By comparison, Converse and Mallucci (2023) find that a one standard deviation increase of sovereign risk in one country reduces the portfolio weight of that country by 2.2%, while Forbes et al. (2016) show the introduction of capital controls in Brazil reduced the portfolio weight of Brazil by 3.3%.

Column (3) breaks down emerging market economies in four geographical blocks: Latin America, Emerging Asia, Emerging Europe, and Middle East and Africa (MENA). We find that geopolitical risk has no impact on the portfolio weights of Emerging Asian Economies, while it has a negative and significant impact on all the other county blocs. In Emerging Europe and MENA, the economic impact of geopolitical risk is significant. For Emerging European countries, a one standard deviation increase in their exposure to geopolitical risk leads to a 2.4% decrease of their portfolio weight. In MENA, an increase of geopolitical risk of the same size leads to a 2.2% decrease in the portfolio weight of that country. Portfolio weights are notoriously persistent. When we scale our regression coefficients for the standard deviation of portfolio weights, we find that in emerging Europe and MENA a one-standard deviation increase of geopolitical risk leads to a decline of portfolio weights of more than 7% of the standard deviation of changes in portfolio weights.

Political Alliances

Are portfolio managers less likely to cut back their exposure to countries that are politically aligned when geopolitical risk increases? Table 2 reports coefficient estimates for a set of regressions that interact our geopolitical risk variable with two variables that measure how aligned countries are with the United States, which is the domicile of the vast majority of the funds in our sample. The fist variable is a dummy that is equal to one when countries fall in the top quartile of the ideal point estimates by Bailey et al. (2017).[14] The second variable is a dummy that takes the value of one for countries that are NATO members.

Our results are mixed. On the one hand, we find that political affinity, as measured by UN voting patterns, does not have any impact on the way investors react to geopolitical risk (column 1). On the other hand, we find a positive and significant coefficient for the interaction term of our NATO dummy and the geopolitical risk variable (column 2), indicating that the intensity of investors' response to geopolitical risk is smaller for NATO countries. Explicit military alliances, such as NATO, are more powerful than political affinities in predicting investors' sensitivity to geopolitical risk.

It is important to note that our results are not driven by the fact that NATO countries are mostly advanced economies. Our specification focuses only on emerging markets. In fact, our findings should be interpreted as indicating that emerging markets belonging to NATO, such as Turkey, Poland, and Romania2, are less affected by geopolitical risk than other emerging markets, such as Brazil or Mexico.

The results in columns (4) and (5) replicate the analysis reported in the first two columns of the table, extending the sample of funds to include all funds domiciled in a NATO country. We still find a positive and significant coefficient for the interaction term with the NATO dummy, confirming that investors' response more mildly to geopolitical risk in NATO countries.

The Extensive Margin

Our dependent variable is expressed in logs. This choice follows from the loglinearization of the law of motion of portfolio weights in equation (1). However, log transformation turns zeros into missing values. In our case, this implies that we lose information about portfolio adjustments along the extensive margins. That is, by taking logs we exclude cases in which a fund managers brings down to zero the portfolio share of a country in response to changes in GPR risk.[15]

To insert back adjustments along the extensive margin into the analysis, we proceed in two

[14] Ideal point estimates are constructed using UN voting data and measure how close countries are from the US-led liberal order.

[15] Before taking logs we eliminate from the sample portfolio weights of fund i and country j when they are zeros in every period of time t.

ways. First, we replace the logs of portfolio weights $\omega_{ijt} = log(W_{ijt})$ with the inverse hyperbolic sine (IHS) transformation that preserves zeros: $sinh^{-1}(w_{ijt}) = log\left(y + \sqrt{y^2+1}\right)$.[16] Second, we run a set of linear probability regressions that have, as dependent variable, a dummy variable that is equal to one when the portfolio share is zero.[17]

Table 3 reports the coefficient estimates for our baseline regressions when the IHS transformation is applied to the geopolitical risk variable. The comparison between Table 3 and Table 1 shows that the preservation of zeros increases the sample size but does not alter the overall picture. We still find that geopolitical risk has a negative, significant, and modest impact on portfolio weights.

Table 4 reports the coefficient estimates for the linear probability regressions. Column (1) reports the coefficient estimates when the model is estimated on a sample that only includes emerging markets as the destination countries. We find that the coefficient for the geopolitical risk variable is positive and significant, indicating that the portfolio share of a country is more likely to be equal to zero when geopolitical risk is high. Columns (2) repeats the analysis on a sample that includes all destination countries. We still find that the probability of observing a zero weight increases with geopolitical risk. The coefficient is smaller than in column (1), indicating that the probability of observing a zero weight does not respond as strongly to changes in geopolitical risk when the destination country is an advanced economy.

4.2 When it Matters

Country-specific Geopoltical Risk and Global Geopoltical Risk

Geopolitical risk is nonlinear. It remains flat for several years and then spikes. In Table 5 we check whether the nonlinearity of geopolitical risk translates into a nonlinear response of portfolio weights. In other words, we check whether the intensity of investors' response to geopolitical risk increases with the level of risk. To this end, we construct a dummy variable that is equal to one when the geopolitical risk index of a country falls in the top quartile of the distribution for all countries and all times. Column (1) reports regression estimates

[16] See Chen and Roth (2024) for a detailed discussion of the IHS transformation.

[17] Linear probability models are easier to estimate when the empirical specification includes a large number of fixed effects, as it is the case for our specification. It has been shown that fitted partial effects of linear probability models are very similar to those obtained from probit models where the regressors have main support.

when the dummy variable for high geopolitical risk is interacted with the geopolitical risk index. Two results are worth highlighting. First, the coefficient of geopolitical risk is not significant, indicating that portfolio weights do not respond to geopolitical risk at normal times. Second, the coefficient of the interaction term is negative, significant, and large, implying that fund managers react intensely to geopolitical risk when geopolitical risk is high. According to estimates, a one standard deviation increase in geopolitical risk in a country leads to a decline in the portfolio weight of that country of about 7 percent. Such declines are sizable as they correspond to about 25% of the standard deviation of portfolio weights.

The second column reports coefficient estimates when we augment the baseline regression to include a dummy variable, $High\ GPRW$, that is equal to one when the world's geopolitical risk index is in the top quartile of the distribution. As in column (1), we find that the interaction term is negative, significant, and large, indicating that portfolio managers are more sensitive to geopolitical risk in a country when global geopolitical risk is high.[18] It should be noted that the coefficient for the geopolitical risk variable remains significant, indicating that country-specific geopolitical factors matter even when global risk is high.

The third column reports coefficient estimates when we interact country-specific geopolitical risk with both the dummy that identifies periods of high country-specific geopolitical risk and the dummy that identifies periods of high *global* geopolitical risk. The coefficient estimates in column (3) confirm the results reported in columns (1) and (2). Country-specific geopolitical risk affects portfolio weights only when it is high. At the same time, the negative and significant coefficient for the interaction term between country-specific geopolitical risk and global geopolitical risk (GPRC x High GPRW) confirms that global geopolitical risk amplifies the impact of country-specific geopolitical risk. The inclusion of both interaction terms in the same regression allows us to compare the magnitudes. High country-specific geopolitical risk affects portfolio weights more strongly than high global geopolitical risk. The coefficient of the interaction term between the country-specific geopolitical variable and the dummy for the high geopolitical risk is five times higher than the coefficient of the interaction term between the same variable and the dummy for the high global geopolitical risk.

Our results indicate that the relationship between geopolitical risk and portfolio weights strongly depends on the level of the risk. When a country's exposure to geopolitical risk is modest, it does not play a significant role in shaping portfolio weights. However, when

[18]The coefficient for the $High\ GPRW$ is not reported because it drops from the equation due to time fixed effects.

a country's exposure to geopolitical risk is elevated, geopolitical risk becomes an important determinant of portfolio weights.

Persistence

So far, we focused our analysis on the contemporaneous impact of geopolitical risk on portfolio weights. We now check how portfolio weights respond to changes in geopoltica risk over time. To track the impact of geopolitical risk on portfolios over time, we use the local projection method developed by Òscar Jordà (2005). Our specification for the local projections approach is:

$$\omega_{ijt+h} = \gamma_h GPRC_{it} + \beta_h \mathbf{x_{ijt}} + \psi_{ij} + \theta_t + \nu_{ijt}. \tag{6}$$

Where $\mathbf{x_{itj}}$ is a vector of control variables that include excess returns $(r_{ijt} - r_{it})$ at time t and for the three months before t, the lagged portfolio weight ω_{ijt-1}, and the lagged values of GPRC for the three months before t.

The top panel of Figure 2 plots the impulse response for portfolio weights after an increase in geopolitical risk of one percent. We find that geopolitical risk shocks have a persistent negative impact on portfolio weights. On the impact, a increase in geopolitical risk by one standard deviation leads to a 1% reduction in portfolio weights. This figure is small and consistent with the findings presented in Section 4.1. However, the impact of geopolitical shocks on portfolio weights grows over time. Following a shock of one standard deviation to geopolitical risks, portfolio weights contract almost 2.5%, which corresponds to roughly 8% of the standard deviation of portfolio weights. Even more interestingly, we find that the impact of geopolitical shocks is very persistent. Two years after a geopolitical risk shock, portfolio weights are still well below their original level.

The bottom panel of Figure 2 plots the impulse response of the portfolio weights of EME countries to a one percent increase in geopolitical risk. The shape of the impulse response function is similar to that presented in Figure 2. The impact of geopolitical risk on the portfolio weights of emerging market economies is persistent and is the strongest about ten months to one year after the shock. Once again, we find that portfolio weights of emerging markets are more sensitive to geopolitical risk. A one standard deviation increase in geopolitical risk in a country leads to a decline in the portfolio share of that country of more than 3%, which corresponds to about 10% of the standard deviation of portfolio weights.

In summary, local projections suggest that the impact of geopolitical risk on portfolio weights is persistent and becomes sizable over time, reaching its peak about 10 to 12 months after the initial shock.

5 Geopolitical risk and Portfolio Composition

In Section 5 we focused on the impact of country-specific exposure to geopolitical risk on their portfolio weights. In this section, we move our focus to the overall composition of the portfolio and how it is affected by the geopolitical risk. We are especially interested in detecting signs of financial fragmentation. This is why we focus on variables that provide an indication of the geographical and political diversity of the portfolio. Our variable of interest are: the number of destination countries for each fund, Herfindahl-Hirschman index (HHI) for the portfolio concentration, the relative size of cash holdings, and a measure of the political distance of the portfolio relative to the residence country.[19]

Two measures of geopolitical risk are relevant for our analysis. The first measure is the world's geopolitical risk index $GPRW_t$, which measures the level of geopolitical stress in which funds operate. The second measure, GPR_Exp_{it}, is fund specific, and measures how exposed each fund is to geopolitical risk. GPR_Exp_{it} is computed as the weighted average of the geopolitical risk in each of the destination countries of the fund i's portfolio.[20]

As we turn to the analysis of the portfolio composition, we adjust our econometric specification. Our baseline regression becomes:

$$\begin{aligned} y_{it} =& \beta y_{it-1} + \gamma_1 GPR\_Exp_{it-1} + \gamma_2 GPRW_t + \gamma_3 GPR\_Exp_{it-1} * GPRW_t \\ &+ \gamma_4 Z_{it} + \gamma_5 X_t + \psi_i + \nu_{it}. \end{aligned} \tag{7}$$

[19]We construct our measure of political distance using UN voting data from Bailey et al. (2017). For each fund in our database we compute the average political distance of the destination countries as the weighted average of the political distance of the ideal points of the destination countries and the residence country of the fund. Weights are assigned using portfolio shares. As Luxembourger funds invest money on behalf of a broad set of investors residing in the European Union, we use the GDP-weighted average of ideal points of European countries as the ideal point for Luxembourg funds. Similarly for Irish funds we use a simple average of UK and Europe's average.

[20]Let w_{ijt} be the portfolio weight of country j in fund i at time t and let $GPRC_{jt}$ the exposure of country j to geopolitical risk in time t. The fund specific exposure to geopolitical risk is defined as: $GPR\_Exp_{it} \equiv \sum_{j=1}^{J} w_{ijt} GPRC_{jt}$

Where, y_{it} is our variable of interest, GPR_Exp_{it-1} is the fund-specific exposure to geopolitical risk which is lagged by one period to avoid the circularity between the portfolio composition and the definition of the fund-specific geopolitical risk variable, $GPRW_t$ is the global geopolitical risk variable, Z_{it} is a set fund controls, X_t is a set of time controls, μ_i are fund fixed effects, and ν_{it} is the error term. [21]

Table 6 reports coefficient estimates for our analysis of the portfolio composition. The first column reports estimates when our variable of interest is the number of destination counties in the portfolio. We find that higher levels of global geopolitical risk are associated with a lower number of destination countries in the portfolio of bond funds. At the same time, the impact of deteriorating global geopolitical conditions is stronger in funds that are more exposed to geopolitical risk, as indicated by the negative and significant coefficient of the interaction term. Unlike global geopolitical risk, fund-specific geopolitical exposure per se does not affect the number of destination countries by itself, as indicated coefficient estimates for GPR_Exp_{it}.

Columns (2) and (3) confirm the importance of global geopolitical risk for the composition of bond funds' portfolios. When global geopolitical risk is high, portfolio become more concentrated and the political distance of the portfolio relative to the country of residence of the fund shortens. Once again, we find that the fund-specific exposure to geopolitical magnifies the impact of global geopolitical risk, but has little impact on standalone basis.

Finally, column (4) estimates how the cash holdings change in response to geopolitical risk factors. We find that higher levels of global geopolitical risk lead to higher holdings of cash.[22]

Our analysis of the impact of geopolitical risk on the portfolio composition of bond funds

[21] When fund managers adjust the composition of the portfolio, they modify portfolio weights. Changes to portfolio weights, in turn, mechanically affect GPR_Exp_{it}. To avoid this circularity we lag GPR_Exp_{it} by one period. We also add to the regression a vector of variables Z_{it} controlling for fund level, time-varying factors affecting the evolution of portfolio compositions that are unrelated to geopolitical risk. Following Converse et al. (2023), we select the following controls: two lags of fund flows, current and two lags of fund performance. Finally, as the global geopolitical risk index does not vary across funds, time fixed effects would wash it out. Hence, we replace time fixed effects with a set of variables that describe the state of the global economy. This set of variables is chosen so that estimates of β and γ_4 are almost identical when the regression includes time fixed effects and when it replaces fixed effects with the vector X_t. Variables included in X_t are: The log of the Vix, the broader dollar index, and the crude oil price. We also include the 10-year yield for the US Treasury.

[22] The negative and significant coefficient for the fund-specific exposure to geopolitical risk seems to suggest that funds that are more exposed to geopolitical risk reduce their cash holdings. We think that reverse causality may explain this results. Funds that hold large amounts of cash are by construction less risky than funds that hold small amounts.The negative relation between the fund-specific measure of geopolitical risk and cash holdings simply reflects this mechanical relation

indicates that geopolitical risk leads to financial fragmentation. Funds' portfolio become more concentrated and less diversified as geopolitical risk increases. Political considerations play a role in the way fund managers reshape their portfolios, as it is testified by the decline in the political distance of the portfolio relative to the country of residence of the fund.

6 Fund Flows

How do end investors react to geopolitical risk? Is end investors' behavior similar to that of fund manager? To answer these questions we run a battery of regressions analyzing how end investors modify injections into and redemptions out of funds in response to geopolitical risk.

Our dependent variable is $Net\ Flows_{it}$, net flows into fund i during month t normalized by the fund's total assets at the end of the previous month. The main explanatory variable of interest is $GPR\_Exp_{i,t-s}$ which measures fund-specific exposure to geopolitical risk by taking the average of country-specific GPR across the countries in the fund's portfolio, weighted by the share of the fund's assets allocated to each country. To allow for the possibility that exposure to geopolitical risk has a persistent effect on investor flows, we include the fund's contemporaneous exposure as well as two lags. Our regression equation becomes:

$$Net\ Flows_{it} = \sum_{s=0}^{2} \beta_s GPR\_Exp_{i,t-s} + \gamma_1 X_{it} + \mu_i + \psi_{mt} + \nu_{it}, \tag{8}$$

Where the vector β_s with $s = 0, 1, 2$ is a vector of coefficients tracking the impact of geopolitical risk on fund flows over one quarter.

Several factors affect fund flows beyond geopolitical risk. To control for them, we include in our regression fund fixed effects μ_i, and mandate-time fixed effects ψ_{mt}. Fund fixed effects control for time-invariant characteristics of funds, such as their residence. In this context, a fund's mandate refers to the group of countries in which it is permitted to invest, for example "Global Emerging Markets," "Latin America," or "Europe." So by including mandate-time fixed effects, we are controlling for time varying factors that are specific to each country group but common across countries within each group. After the introduction of fixed effects, all the variation that is left comes from factors that vary over time at the fund level. We therefore include in our regression a set of variables X_{it} that control for time-varying fund characteristics. To control for the macroeconomic outlook in the countries in each fund's portfolio, we include the weighted average of expected GDP growth and inflation.[23] Because the literature on the drivers of fund flows has found significant evidence of momentum and returns chasing (Christoffersen et al., 2014), we also include two lags of fund flows and two lags of fund performance.

Coefficient estimates for regression (8) are reported in the first column Table 7. The coefficient for $GPR\_Exp_{i,t-1}$ is negative and significant and large, indicating that end investors reduce net inflows to funds that are more exposed to geopolitical risk. This effect, however, is not persistent. The coefficient for $GPR\_Exp_{i,t-3}$ is positive and significant indicating that fund flows begin to recover already after one quarter.

Column (1) also reports coefficient estimates for the expected one-year ahead weighted average of GDP growth in destination countries and the expected one-year ahead weighted average inflation taken from consensus. Coefficient estimates of these two variables provide a reference point to gauge the importance of geopolitical risk. A 10% increase in the geopolitical risk exposure is associated with a 7.8% decline of fund flows. For comparison, a 10% increase in the average GDP growth of the countries in the portfolio leads to a 4.2% decline of fund flows.

Column (2) introduces an interaction in the regression equation. The coefficient estimate for the interaction term is negative and significant indicating that the response fund flows to fund-specific geopolitical risk is stronger when global geopolitical risk is higher. This is consistent with the idea may pay more attention to their own exposure to geopolitical risk when geopolitical risk is more salient.

Finally, columns (3) and (4) verify that results still hold when we expand the sample to include passive funds. Throughout the paper, we focused on active bond funds, as only fund managers of active funds adjust portfolios in reaction to changes to the investment environment. End investors, however, are not restricted by mandates, and actively manage fund flows to both active and passive funds. The inclusion of passive funds does not alter our key results. We still find that end investors reduce net flows to funds that are more exposed to geopolitical risk.

Figure 3 plots how flows to a fund change when that fund becomes more exposed to geopolit-

[23]Specifically, for GDP and inflation, we take the average of the Consensus forecast for the current year and the next year ahead, then average the across countries in the funds portfolio, using the fund's portfolio allocations as weights.

ical risk.[24] As indicated by coefficient estimates for equation (8), end investors react strongly to geopolitical risk on the impact. However, the effect is transitory. Fund flows fully recover less than one quarter after the initial increase in geopolitical risk.

7 A Delegated Portfolio Management Framework

The theoretical literature on fund managers and end investors is mostly concerned about information asymmetries, incentive alignment challenges (Jensen and Meckling, 1976), and behavioral responses to market performances (Berk and Green, 2004; Barberis et al., 1998; Barberis and Shleifer, 2003) that justify the existence of investment funds and at the same time shape the relationship between end investors and portfolio managers.

Our objective is far less ambitious. We develop a simple theoretical model of the interplay between end investors and mutual funds that takes the existence of fund managers as given and rationalizes our empirical findings. In particular, we show that an increase in geopolitical risk leads to a decline of the portfolio weight of countries that are more exposed to such risk. And, at the same, time fund flows decline.

7.1 Environment

We develop dynamic delegated portfolio management framework featuring two agents: portfolio managers and end investors. Portfolio managers have access to two instruments issued by different countries, and choose how to allocate funds between these two instruments. End investors decide how much money to entrust to portfolio managers.

While bonds are safe assets, their returns are in practice volatile, especially for international investors, as factors, such as the exchange rate, indexation, and credit risk, affect realized returns. To take these factors into accounts, we assume that the returns of the two assets are normally distributed. It is also assumed that returns are subject to the risk of adverse geopolitical events. Geopolitical events hit both assets simultaneously with an exogenous probability p. The realization of geopolitical risk reduces returns and increases the variance

[24] The impulse response function is computed using local projection method. The regression equations includes: fund and destination-time fixed fixed, three lags of $GPR\_Exp_{i,t-s}$ and $Net\ Flows_{it}$, plus contemporaneous values and three lags of funds' performances.

of both assets. Return dynamics are as follows:

$$r_{1t} = \begin{cases} \mu_1 + \Delta^S \mu_1 + \varepsilon_{1t}^S, & \text{w/ prob. } p \\ \mu_1 + \varepsilon_{1t}, & \text{w/ prob. } 1-p \end{cases} \qquad r_{2t} = \begin{cases} \mu_2 + \Delta^S \mu_2 + \varepsilon_{2t}^S, & \text{w/ prob. } p \\ \mu_2 + \varepsilon_{2t}, & \text{w/ prob. } 1-p \end{cases}$$

where $\varepsilon_{it}^S \sim \mathcal{N}(0, \sigma_i^2 + \Delta^S \sigma_i^2)$ and $\varepsilon_{it} \sim \mathcal{N}(0, \sigma_i^2)$.

In this context, an increase of geopolitical risk can be understood as an increase in the probability p. That is, an increase in the likelihood that a geopolitical event materializes.

To reflect the fact countries are exposed to geopolitical risk with a different intensity, we assume without loss of generality that the impact of a geopolitical events on country 2 is negligible:

$$\Delta^s \mu_1 < \Delta^s \mu_2 = 0; \quad \Delta^s \sigma_1 > \Delta^s \sigma_1 = 0 \tag{9}$$

.

The environment also features fund managers and end investors. Fund managers solve the portfolio decision problem choosing how to allocate funds between the two assets. End investors decide how much money to entrust to fund managers. Decisions by end investors and fund managers are interlinked. Fund mangers' portfolio allocations determine the risk-return profile of the portfolios, affecting in turn how much money end-investors entrust to them. In turn, fund flows affect fund managers' profits thorough management fees.

7.2 End Investor's Problem

End investors have deep pockets. At each time t, the representative allocates flows into a fund based on their trade-off between expected returns and perceived risk. Let A_t be the value of the assets held by fund managers at the beginning of time t, and f_t net flows from end investors at time t. The representative end-investor chooses f_t to maximize a simple expected utility function:

$$\max_{f_t} \quad \mathbb{E}_t \left[(A_t + f_t)\left(R_{t+1} - \eta \text{Var}_t(R_{t+1})\right) - \frac{\theta}{2} f^2 \right]. \tag{10}$$

Where R_{t+1} is the fund portfolio return at $t+1$ and $Var_t(R_{t+1})$ is the variance of future returns. Parameter η captures risk aversion, and the quadratic term θf^2 captures the cost of adjusting fund flows.

The first order condition for the investor's problem gives:

$$f_t = \frac{1}{\theta}\left(\mathbb{E}_t[R_{t+1}] - \eta \text{Var}_t(R_{t+1})\right). \tag{11}$$

Net fund flows increase in the expected portfolio returns and decrease with the variance. One can expand terms in equation (17) to highlight the role of geopolitical risk. Let ω_t be the portfolio weight of country 1. The expected return of the portfolio is:

$$\mathbb{E}_t[R_{t+1}] = \omega_t\left(\mu_1 + p\Delta^S\mu_1\right) + (1-\omega_t)\mu_2. \tag{12}$$

And the variance is:

$$\text{Var}_t(R_{t+1}) = \omega_t^2\left(\sigma_1^2 + p\Delta^S\sigma_1^2 - p(1-p)\left(\Delta^S\mu_1\right)^2\right) + (1-\omega_t)^2\sigma_2^2. \tag{13}$$

7.3 Portfolio Manager's Problem

Portfolio managers choose the portfolio weight ω_t to maximize the expected discounted sum of fees earned on assets under management. Portfolio managers are subject to adjustment costs when they modify their portfolio and, like end-investors, dislike volatility.

The maximization problem of portfolio managers is:

$$V(\omega_{t-1}, A_t) = \max_{\omega_t\in[0,1]}\{\alpha(A_t + f_t) - \frac{\kappa}{2}(\omega_t - \omega_{t-1})^2 + \beta\mathbb{E}V(A_{t+1}, \omega_{t+1})\} \tag{14}$$

Subject to:

$$f_t = \frac{1}{\theta}\left(\mathbb{E}_t[R_{t+1}] - \eta\text{Var}_t(R_{t+1})\right). \tag{15}$$

$$A_{t+1} = (A_t + f_t)(1 + R_{t+1}) \tag{16}$$

Where α is the fee rate on the assets under management, and κ determines severity of the portfolio adjustment costs.

The first order condition associated with the maximization problem of the portfolio manager is:

$$\omega_1 : \ \kappa(\omega_t - \omega_{t-1}) - \alpha \frac{\partial f}{\partial \omega_t} = \beta \frac{\partial \mathbb{E} V(A_{t+1}, \omega_{t+1})}{\partial \omega_t} \tag{17}$$

Where:

$$\frac{\partial f}{\partial \omega_t} = \frac{1}{\theta} \left(\frac{\partial \mathbb{E} R_{t+1}}{\partial \omega_t} - \eta \frac{\partial Var(R_{t+1})}{\partial \omega_t} \right) \tag{18}$$

$$\frac{\partial \mathbb{E} V(A_{t+1}, \omega_{t+1})}{\partial \omega_t} = \mathbb{E}_t \left[\frac{\partial V_{t+1}}{\partial A_{t+1}} \frac{\partial A_{t+1}}{\partial \omega_t} + \frac{\partial V_{t+1}}{\partial w_t} \right] \tag{19}$$

Combining equations (17), (18), and (19) and assuming, without loss of generality, that $\eta \to 0$ and $\eta_1 \to 0$, it is possible to derive an analytical solution for the first order condition:

$$\omega_t = \frac{\kappa(\omega_{t-1} + \beta \omega_{t+1}) + \Phi(\mu_1^{tot} - \mu_2)}{\kappa(1+\beta) - \Psi\left(\mu_1^{tot} - \mu_2\right)^2}. \tag{20}$$

Where $\Phi \equiv \frac{\alpha}{\theta}(1 + \beta + 2\beta\mu_2)$, $\Psi \equiv \frac{2\alpha\beta}{\theta}$, and $\mu_1^{tot} \equiv \mu_1 + p\Delta^s \mu_1$ is the expected return of asset one considering geopolitical risk.

7.4 Fund Flows and Portfolio Weights' Behavior

The next two propositions define how fund flows and portfolio weights respond to geopolitical risk.

Proposition 1. *As long as $\kappa > \Psi \frac{\mu_1^{tot} - \mu_2}{1+\beta}$, the portfolio weight ω_t of a country is:*

- *Increasing in the country's past portfolio weight ω_{t-1}.*
- *Increasing in the return of that country relative to the other countries*
- *Decreasing in geopolitical risk p.*

Proof. From equation (20):

$$\frac{\partial \omega_t}{\partial \omega_{t-1}} = \frac{\kappa}{\kappa(1+\beta) - \Psi\left(\mu_1^{tot} - \mu_2\right)^2} > 0 \tag{21}$$

$$\frac{\partial \omega_t}{\partial \mu_1^{tot}} = \frac{\Phi}{\kappa(1+\beta) - \Psi\left(\mu_1^{tot} - \mu_2\right)^2} + \frac{2\Psi\left(\mu_1^{tot} - \mu_2\right)}{\left(\kappa(1+\beta) - \Psi\left(\mu_1 + p\Delta^s\mu_1 - \mu_2\right)^2\right)^2} > 0. \tag{22}$$

$$\frac{\partial \omega_t}{\partial p} = \Delta^s \mu_1 \frac{\partial \omega_t}{\partial \mu_1^{tot}} < 0. \tag{23}$$

□

Proposition 2. *An increase of geopolitical risk leads to a decline of net flows f_t:*

Proof. An increase in geopolitical risk is an increase in the probability p that an adverse geopolitical event materializes. From equation (17):

$$\frac{\partial f}{\partial p} = \frac{1}{\theta}\left(\frac{\partial E_t[R_{t+1}]}{\partial p} - \eta \frac{\partial \mathrm{Var}_t(R_{t+1})}{\partial p}\right); \tag{24}$$

$$\frac{\partial f}{\partial p} = \frac{1}{\theta}\frac{\partial E_t[R_{t+1}]}{\partial p}, \quad \text{if } \eta \to 0. \tag{25}$$

From Equation (12):

$$\frac{\partial E_t[R_{t+1}]}{\partial p} = \omega_t \Delta^S \mu_1 + \frac{\partial \omega_t}{\partial p}(\mu_1^{tot} - \mu_2). \tag{26}$$

By construction, we know that $\Delta^S \mu_1 < 0$ and $\mu_1^{tot} > \mu_2$. At the same time, from Proposition 1, we know $\frac{\partial \omega_t}{\partial p} < 0$. It follows that:

$$\frac{\partial f}{\partial p} < 0. \tag{27}$$

□

8 Conclusion

We examine how geopolitical risk affects the portfolio of international investors using monthly data on mutual bond funds. We find that the the impact of geopolitical risk on portfolio position is generally modest on the impact, but is persistent and grows bigger over time. A one standard deviation increase in geopolitical risk reduces the portfolio weight of a generic country by 1.4% on the impact and 3.8% after 10 to 12 months. Geopolitical risk has as a stronger impact on the portfolio weight of Emerging Market Economics and non-NATO countries. The level also matters. Portfolio weights are hardly affected by geopolitical risk when it is low or moderate. However, when high or extreme, the impact of geopolitical risk on portfolio weights becomes sizable.

We also find evidence of financial fragmentation. When global geopolitical risk increases, funds' portfolios become more concentrated, the number of destination countries drops, and cash holdings increase. The political distance of the portfolio relative to the country of residence of the fund also declines.

Finally, we find that end investors also react adversely to geopolitical risk. End investors aggressively reduce net flows to a fund when that fund becomes more exposed to geopolitical risk. However, unlike fund managers, end investors reverse course quickly. Fund flows into funds resume already one quarter after the initial shock.

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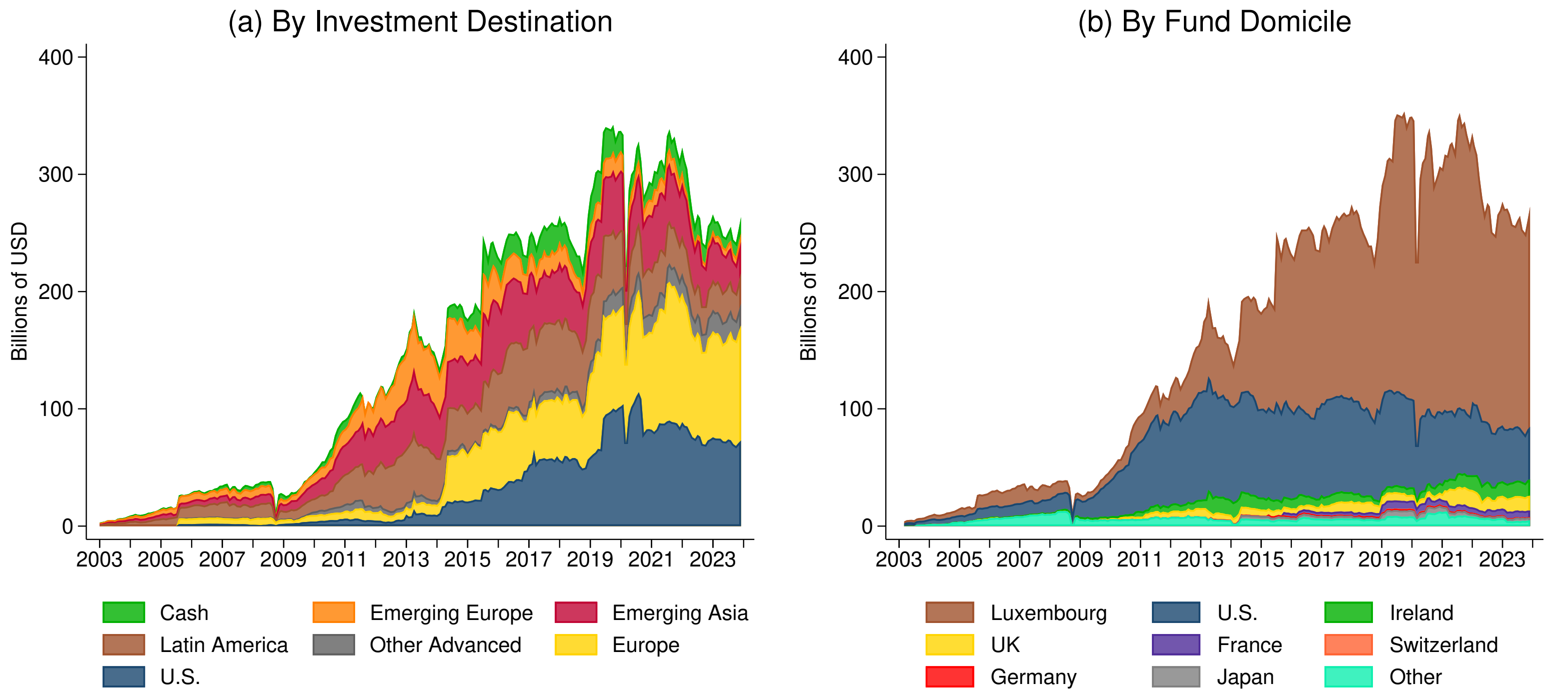
9 Tables and Figures

Figure 1. Fund Holdings by Destination and Domicile



Source: EPFR, authors' calculations

Asset under management in USD by investment destination (left panel) and fund domicile (right panel).

Table 1. Baseline and Variation Across Destination

	(1)	(2)	(3)
ω_{ijt-1}	0.873***	0.909***	0.914***
	(0.00458)	(0.00357)	(0.00432)
$r_{jt} - r_{it}$	0.754***	0.784***	0.936***
	(0.0372)	(0.0366)	(0.0422)
ln GPRC	-0.00631***	0.0110*	-0.00277**
	(0.000763)	(0.00566)	(0.00131)
ln GPRC x non-US AE		-0.00326	
		(0.00577)	
ln GPRC x EME		-0.0198***	
		(0.00577)	
ln GPRC x EM Asia			0.00355**
			(0.00174)
ln GPRC x EM Europe			-0.0140***
			(0.00223)
ln GPRC x Mideast /Africa			-0.0124***
			(0.00287)
N	584102	553192	328943
Fund-Country FE	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes
Asset	Bonds	Bonds	Bonds
Domicile	Anglo/Lux	Anglo/Lux	Anglo/Lux
Destination	All	All	EMEs
R^2	0.958	0.970	0.967

Column (1) reports the baseline regression. Columns (2) and (3) check for heterogeneous responses explained by differences in the destination countries.

Table 2. Political Alliances

	(1)	(2)	(3)	(4)
ω_{ijt-1}	0.914***	0.914***	0.917***	0.917***
	(0.00475)	(0.00470)	(0.00827)	(0.00817)
$r_{jt} - r_{it}$	0.983***	0.981***	0.810***	0.813***
	(0.0498)	(0.0485)	(0.0562)	(0.0544)
ln GPRC	-0.00718***	-0.00857***	-0.00757***	-0.00828***
	(0.00107)	(0.00106)	(0.00157)	(0.00153)
ln GPRC x Dummy Ideal Point	0.00150		0.000956	
	(0.00117)		(0.00155)	
ln GPRC x NATO		0.0128***		0.00631*
		(0.00264)		(0.00321)
N	271481	280946	132502	135781
Fund-Country FE	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
Asset	Bonds	Bonds	Bonds	Bonds
Domicile	Anglo/Lux	Anglo/Lux	NATO	NATO
Destination	EME	EME	EME	EME
R^2	0.965	0.966	0.958	0.959

Heterogeneous effect explained by political alliances. Dummy ideal point is equal to one for the countries in the top quartile of the distribution for the ideal point variable computed by Bailey et al. (2017). NATO is a dummy that is equal to one when the destination country is a NATO member.

Table 3. Baseline with IHS Transformation

	(1)	(2)	(3)
ω_{ijt-1}^{Transf}	0.877***	0.915***	0.922***
	(0.00570)	(0.00458)	(0.00522)
$r_{jt} - r_{it}$	0.292***	0.298***	0.334***
	(0.0184)	(0.0185)	(0.0214)
ln GPRC	-0.00448***	0.00653	-0.000929
	(0.000511)	(0.00568)	(0.000778)
ln GPRC x non-US AE		-0.00469	
		(0.00569)	
ln GPRC x EME		-0.0112**	
		(0.00566)	
ln GPRC x EM Asia			-0.0000279
			(0.00107)
ln GPRC x EM Europe			-0.00685***
			(0.00125)
ln GPRC x Mideast /Africa			-0.00863***
			(0.00154)
N	728153	698784	448869
Fund-Country FE	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes
Fund ID Fixed Effects			
Asset	Bonds	Bonds	Bonds
Sample	All	All	EMEs
Domicile	Anglo/Lux	Anglo/Lux	Anglo/Lux
R^2	0.955	0.971	0.966

Portfolio wieghts are transformed to preserve zero observations. Column (1) reports the baseline regression. Columns (2) and (3) check for heterogeneous responses explained by differences in the destination countries.

Table 4. Probability of Observing Zero Weights

	(1)	(2)
ω_{ijt-1}	-0.0241***	-0.0231***
	(0.00124)	(0.00105)
$r_{jt} - r_{it}$	-0.103***	-0.0918***
	(0.0170)	(0.0149)
ln GPRC	0.00117***	0.000900**
	(0.000447)	(0.000380)
N	287035	459065
Fund-Country FE	Yes	Yes
Time Fixed Effects	Yes	Yes
Fund ID Fixed Effects		
Asset	Bonds	Bonds
Sample	EMEs	ALL
Domicile	Anglo/Lux	Anglo/Lux
R^2	0.112	0.117

Probability of observing a zero portfolio weight. Column (1) reports linear probability estimates for the sample of EMEs. Columns (2) reports linear probability estimates for the sample of all countries.

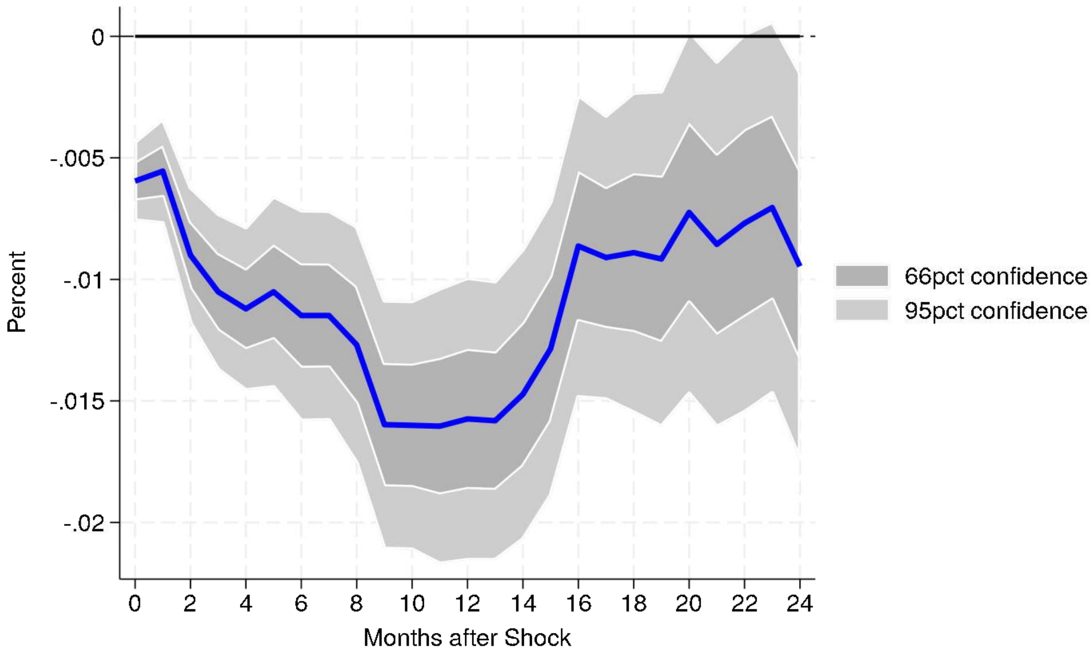
Table 5. Country-Specific Geopolitical Risk and Global Geopolitical Risk

	(1)	(2)	(3)
ω_{ijt-1}	0.913***	0.913***	0.913***
	(0.00475)	(0.00471)	(0.00475)
$r_{jt} - r_{it}$	0.953***	0.970***	0.949***
	(0.0475)	(0.0482)	(0.0474)
ln GPRC	-0.00117	-0.00249**	0.000188
	(0.00107)	(0.00106)	(0.00109)
ln GPRC x High GPRC	-0.0445***		-0.0384***
	(0.00383)		(0.00384)
ln GPRC x High GPRW		-0.0117***	-0.00634***
		(0.00103)	(0.000964)
N	280982	280982	280982
Fund-Country FE	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes
Asset	Bonds	Bonds	Bonds
Domicile	Anglo/Lux	Anglo/Lux	Anglo/Lux
Destination	EME	EME	EME
R^2	0.966	0.966	0.966

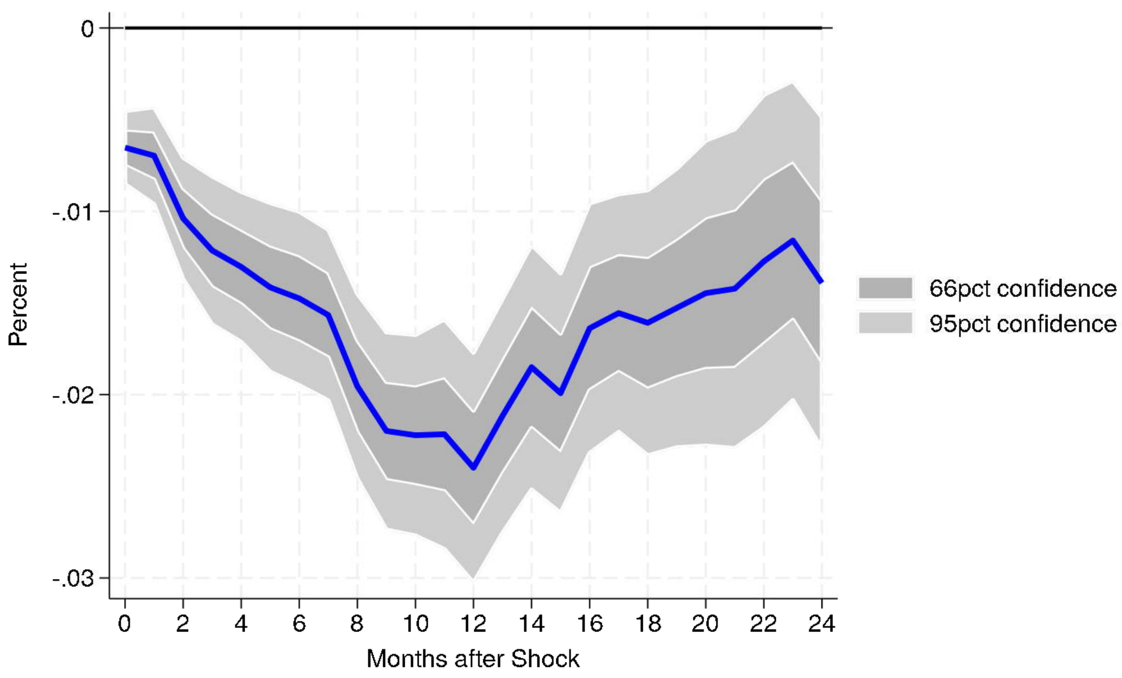
Column (1) checks for heterogeneous effects when the country-specific geopolitical risk index is high. Column (2) checks for heterogeneous effects when the global geopolitical risk index is high. Column (3) checks simultaneously for heterogeneous effects when GRPC and GPRW are high.

Figure 2. Impulse Responses to a Geopolitical Risk Shock

Portfolio Weights



Portfolio Weights: EMEs



Portfolio weights responses to a one percent increase in geopolitical risk. Impulse responses are computed using local projection methods (Òscar Jordà, 2005)

Table 6. Fund Flows

	n° Countries	HHI	Cash	Ave. Dist vs US
Dep var$_{t-1}$	0.919***	0.897***	0.474***	0.814***
	(0.00849)	(0.00800)	(0.0183)	(0.0690)
GPR Exp$_{t-1}$	-0.000230	-0.000654	-0.0711***	-0.000212
	(0.00215)	(0.00376)	(0.0254)	(0.00345)
GPRW	-0.00838***	0.0111***	0.0819***	-0.00976***
	(0.00233)	(0.00370)	(0.0297)	(0.00345)
GPRW * GPR Exp$_{t-1}$	-0.00371***	0.00315*	0.0156	-0.00801***
	(0.00128)	(0.00187)	(0.0156)	(0.00225)
N	25384	25384	20790	25384
Fund- and TS Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Time Fixed Effects	No	No	No	No
Asset	Bonds	Bonds	Bonds	Bonds
Domicile	Anglo-Lux	Anglo-Lux	Anglo-Lux	Anglo-Lux
Fund types	EME & Global	EME & Global	EME & Global	EME & Global
R^2	0.983	0.983	0.540	0.983

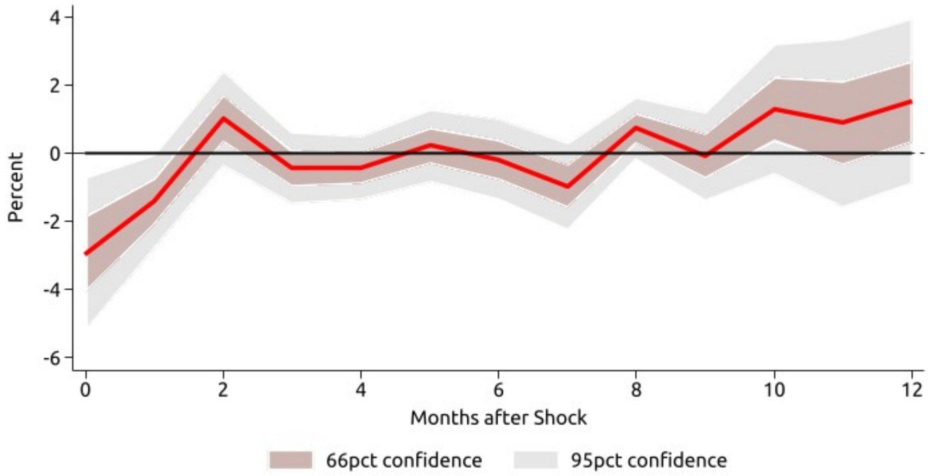
Column (1) reports coefficients estimate when the dependent variable is the number of destination countries. In Column (2), the dependent variable is the HHI index, measuring the concentration of the portfolio. In column (3), the dependent variable is the log of cash holdings. In column (4), the dependent variable is the log of the average political distance of the countries in the portfolio, weighted by country weights. The political distance is measured as the log distance of the ideal point estimate (Bailey et al., 2017).

Table 7. Fund Flows

	(1) Flows(%AUM)	(2) Flows(%AUM)
Ln GPR_Exp_t	-0.787***	-0.706**
	(0.280)	(0.281)
Ln GPR_Exp_{t-1}	0.222	0.205
	(0.285)	(0.285)
Ln GPR_Exp_{t-2}	0.444*	0.459*
	(0.253)	(0.253)
$Growth_{t+12}$	-0.424***	-0.444***
	(0.143)	(0.144)
π_{t+12}	-0.0437**	-0.0433**
	(0.0179)	(0.0178)
GPR Exp_t * High GPRW		-0.294**
		(0.148)
N	23257	23257
Fund-level Controls	Yes	Yes
Fund FE	Yes	Yes
Time FE	No	No
Mandate-Time FE	Yes	Yes
Asset	Bonds	Bonds
Domiciles	Anglo-Lux	Anglo-Lux
Fund Type	EM & Global	EM & Global
R^2	0.202	0.202

Fund flows are measured as a percentage of the funds under management. Column (1) reports coefficients estimate for the baseline fund flow regression. Column (2) introduces an interaction term to test for the heterogeneous response when global geopolitical risk is high.

Figure 3. Fund Flows Response to an increase in Geopolitical Risk



Net fund flow response to a one percent increase in the average geopolitical risk of a fund. Impulse responses are computed using local projection methods (Òscar Jordà, 2005)

A Funds' Residence

Table 8. Variation Across Fund Location

	(1)	(2)	(3)	(4)	(5)	(6)
ω_{ijt-1}	0.909***	0.916***	0.912***	0.906***	0.908***	0.913***
	(0.00357)	(0.00990)	(0.00832)	(0.00384)	(0.00392)	(0.00874)
$r_{jt} - r_{it}$	0.784***	0.771***	0.730***	0.901***	0.826***	0.662***
	(0.0366)	(0.0688)	(0.0639)	(0.0551)	(0.0425)	(0.0643)
ln GPRC	0.0110*	0.0260	0.0228	0.0138**	0.0162**	-0.0124
	(0.00566)	(0.0202)	(0.0155)	(0.00666)	(0.00647)	(0.0110)
ln GPRC x non-US AE	-0.00326	-0.0225	-0.0175	-0.00398	-0.00768	0.0165
	(0.00577)	(0.0216)	(0.0165)	(0.00668)	(0.00666)	(0.0108)
ln GPRC x EME	-0.0198***	-0.0342*	-0.0316**	-0.0229***	-0.0251***	0.00537
	(0.00577)	(0.0200)	(0.0154)	(0.00690)	(0.00655)	(0.0115)
N	553192	108166	145926	304658	450584	102608
Fund-Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Asset	Bonds	Bonds	Bonds	Bonds	Bonds	Bonds
Domicile	All	US	Anglophone	Lux	Anglo/Lux	non-Anglo/Lux
Destination	All	All	All	All	All	All
R^2	0.970	0.961	0.961	0.972	0.969	0.977

Column (1) reports coefficient estimates for the a regression that checks for the differential response to geopolitical risk explained by the destination country. Columns (2) to (6) check for heterogeneous responses explained by differences in the domicile of funds.

B Geopolitical Risk and Country Portfolio Weights: Additional Analysis

B.1 Robustness of Key Findings

Our identification strategy is very parsimonious. Fund-country fixed effects ensure that no cross sectional country or fund characteristics will generate omitted variable bias. Time fixed effects ensure that no development that affects portfolio weights over time but not across countries will generate omitted variable bias. Factors that vary over time within individual countries are, instead, a potential sources of omitted variable bias. To alleviate concerns about omitted variable bias, we expand the set of regressor to include variables that vary over time and within individual countries. In particular, given the forward looking nature of investment decisions, we include variables from consensus, measuring key economic and financial variables. Table 9 reports regression estimates, when forecast for GDP, industrial production , CPI, and fiscal balance are added to the regression. The inclusion of these variables has a modest impact on our estimates. The coefficient for GPRC declines marginally but remains negative and significant, confirming that an increase in geopolitical risk in a country leads to a contraction of the portfolio weight of that country.

Table 9. Robustness - Consensus

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ω_{ijt-1}	0.914***	0.912***	0.913***	0.912***	0.912***	0.913***	0.913***	0.912***
	(0.00470)	(0.00499)	(0.00497)	(0.00503)	(0.00503)	(0.00496)	(0.00496)	(0.00506)
$r_{jt} - r_{it}$	0.985***	1.064***	1.072***	1.073***	1.079***	1.079***	1.078***	1.066***
	(0.0487)	(0.0558)	(0.0566)	(0.0572)	(0.0578)	(0.0569)	(0.0566)	(0.0573)
ln GPRC	-0.00686***	-0.00604***	-0.00621***	-0.00530***	-0.00556***	-0.00667***	-0.00668***	-0.00481***
	(0.000990)	(0.00110)	(0.00111)	(0.00114)	(0.00116)	(0.00113)	(0.00113)	(0.00114)
GDP Current		0.00260***						0.00242***
		(0.000362)						(0.000665)
GDP Next			0.00326***					0.00234**
			(0.000708)					(0.00118)
IP Current				0.00123***				-0.000299
				(0.000219)				(0.000360)
IP Next					0.00126***			0.0000292
					(0.000469)			(0.000787)
CPI Current						-8.04e-11		9.43e-11
						(1.35e-10)		(1.40e-10)
CPI Next							1.36e-11	9.83e-11***
							(2.80e-11)	(3.37e-11)
N	280946	241247	241247	222035	222035	241247	241247	222035
Fund-Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Asset	Bonds	Bonds	Bonds	Bonds	Bonds	Bonds	Bonds	Bonds
Domicile	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux
Destination	EME	EME	EME	EME	EME	EME	EME	EME
R^2	0.966	0.966	0.966	0.966	0.966	0.966	0.966	0.966

GDP, Industrial production, and CPI are taken from consensus. Current refers to consensus estimates for the current year. Next refers to consensus estimates for next year.

B.2 Funds' Characteristics

We verify whether funds' characteristics also affect the intensity of investors' response to geopolitical risk in a predictable way. Table 10 summarizes our key findings. We find that several funds' characteristics impact the intensity of investors' response to geopolitical risk. Funds that have experienced large inflows into the funds and have had positive performances react more mildly to geopolitical risk, as shown by the positive and significant interaction terms in columns (3) and (4). Dedicated emerging market funds and regional funds (columns 4 and 5) are also more lenient when it comes to geopolitical risk. The size of funds (column 1), that we measure as the dollar value of assets under management, does not have, instead, any impact on the intensity of funds response to geopolitical risk.

Table 11 reports coefficient estimates for a battery of regressions that checks whether different types of funds react differently to geopolitical risk. We find that all funds react similarly: sovereign debt funds, corporate debt funds, high yield funds, short and log-term funds, as well as funds owned by banks all react similarly to geopolitical risk.

It is important to point out that the impact of funds' characteristics on the intensity of fund managers' response to geopolitical risk is small even for funds' characteristics that have a statistically significant impact on the intensity of investors' response. We conclude that funds' characteristics affect how investors react to geopolitical risk only modestly.

Table 10. Funds' Characteristics

	(1)	(2)	(3)	(4)	(5)
ω_{ijt-1}	0.914***	0.914***	0.915***	0.914***	0.914***
	(0.00470)	(0.00471)	(0.00462)	(0.00470)	(0.00470)
$r_{jt} - r_{it}$	0.985***	0.985***	0.978***	0.985***	0.985***
	(0.0487)	(0.0488)	(0.0508)	(0.0487)	(0.0487)
ln GPRC	-0.00703***	-0.00687***	-0.00693***	-0.00981***	-0.00720***
	(0.00102)	(0.000991)	(0.00101)	(0.00174)	(0.00106)
Lagged Size	0.000329				
	(0.000341)				
ln GPRC X Lagged Size	0.000112				
	(0.000103)				
Lagged Perf,		0.00112			
		(0.000734)			
ln GPRC X Lagged Perf.		0.00116***			
		(0.000183)			
Lagged Inflows			0.00104***		
			(0.000380)		
ln GPRC X Lagged Inflows			0.000262**		
			(0.000114)		
ln GPRC X EM Fund				0.00414**	
				(0.00204)	
ln GPRC X Regional fund					0.00409*
					(0.00234)
N	280518	280170	271307	280946	280946
Fund-Country FE	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Asset	Bonds	Bonds	Bonds	Bonds	Bonds
Destination	EME	EME	EME	EME	EME
Domicile	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux
R^2	0.966	0.966	0.966	0.966	0.966

Heterogeneous effect of fund size (column 1), lagged performance (column 2), lagged injections into the fund (column 3), EME-focused funds (column 4), regional funds (column 5).

Table 11. Funds' Type

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ω_{ijt-1}	0.914***	0.914***	0.914***	0.914***	0.914***	0.914***	0.914***	0.914***
	(0.00470)	(0.00469)	(0.00470)	(0.00470)	(0.00470)	(0.00470)	(0.00470)	(0.00470)
$r_{jt} - r_{it}$	0.985***	0.985***	0.985***	0.985***	0.985***	0.985***	0.985***	0.985***
	(0.0487)	(0.0487)	(0.0487)	(0.0487)	(0.0487)	(0.0487)	(0.0487)	(0.0487)
ln GPRC	-0.00686***	-0.00675***	-0.00698***	-0.00678***	-0.00695***	-0.00686***	-0.00669***	-0.00653***
	(0.000990)	(0.00102)	(0.00102)	(0.00102)	(0.00102)	(0.000990)	(0.00107)	(0.00115)
ln GPRC X Sovereign		-0.00250						-0.00931
		(0.00669)						(0.00982)
ln GPRC X Corporate			0.00317					0.00264
			(0.00429)					(0.00432)
ln GPRC X High Yield				-0.00146				-0.00160
				(0.00351)				(0.00352)
ln GPRC X Short Term					0.00405			0.0108
					(0.00525)			(0.0114)
ln GPRC X Long Term						0.000558		0.00254
						(0.00919)		(0.00840)
ln GPRC X Bank							-0.000606	-0.000795
							(0.00149)	(0.00150)
N	280946	280946	280946	280946	280946	280946	280946	280946
Fund-Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Asset	Bonds	Bonds	Bonds	Bonds	Bonds	Bonds	Bonds	Bonds
Destination	EME	EME	EME	EME	EME	EME	EME	EME
Domicile	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux	Anglo/Lux
R^2	0.966	0.966	0.966	0.966	0.966	0.966	0.966	0.966

Heterogeneous effect of fund types. Bank funds are funds that are owned by banks.