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# Country Risk*

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ABSTRACT

We construct new measures of country risk and sentiment as perceived by global investors and executives using textual analysis of the quarterly earnings calls of publicly listed firms around the world. Our quarterly measures cover 45 countries from 2002-2020. We use our measures to provide a novel characterization of country risk and to provide a harmonized definition of crises. We demonstrate that elevated perceptions of a country's riskiness are associated with significant falls in local asset prices and capital outflows, even after global financial conditions are controlled for. Increases in country risk are associated with reductions in firm-level investment and employment. We also show direct evidence of a novel type of contagion, where foreign risk is transmitted across borders through firm-level exposures. Exposed firms suffer falling market valuations and significantly retrench their hiring and investment in response to crises abroad.

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Finally, we provide direct evidence that heterogeneous currency loadings on global risk help explain the cross-country pattern of interest rates and currency risk premia.

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## 1. Introduction

Researchers and policymakers often argue that global perceptions of risk are a major driver of international capital flows, financial contagion, and sudden stops. In addition, business leaders often cite crises in foreign markets where they may produce their products, sell their products, or be otherwise exposed as holding up their investment and employment decisions. Although such notions of country risk and its transmission across borders feature prominently in policy circles and boardrooms, quantifying and analyzing global risk perceptions has proven more difficult.

This paper aims to fill the gap and re-examine the conventional wisdom systematically by analyzing what global executives and investors say about the exposures, risks, and opportunities their firms face worldwide. In particular, we apply natural language processing (NLP) to the conference call transcripts of publicly listed firms around the world to build an index of perceived risks and opportunities relating to each of 45 major economies that collectively cover more than 90% of world GDP. The key advantage of this approach is its granularity: it allows us to separate global risks from those associated with particular countries, firms, and industries; distinguish variation in perceived risk (the second moment) from variation in perceived opportunities and sentiment (the first moment); and separate the perceptions of foreign from domestic agents.

Measuring the perceived risks and opportunities of countries around the world from firms' earnings call transcripts has a number of further advantages. First, it allows us to directly link country risk as perceived by global executives and investors to country-level capital flows, assets prices, and firm-level decisions. Second, by aggregating *within-firm* perceptions of countries, we can straightforwardly operationalize and test for the nature of contagion between foreign country risk and domestic firm-level investment and employment decisions. Finally, by aggregating *across-firm* perceptions of countries, we are able to measure, decompose and diagnose sudden spikes in country risk.

After discussing the construction and validation of our measures, we use our new time series of country risk to document a number of new findings. First, we demonstrate that countries that become riskier in the eyes of global investors experience falling asset prices. In particular, increases in a country's perceived riskiness is accompanied by sharp declines in equity prices and increases in equity volatility. We also show that elevated risk is associated with elevated CDS spreads and bond yields, with effects particularly strong in emerging markets. Second, we document a similar relationship between risk and global capital flows. In particular, we find that elevated levels of country risk coincide with foreign investors pulling capital out of the country; this result holds even conditional on country and year-quarter fixed effects, indicating that these flows are moving with country-specific fluctuations in riskiness. There is a large literature, beginning with Calvo et al. (1996) demonstrating the importance of "push factors" in explaining global capital flows. These push factors speak to the relative importance of common shocks, particularly in developing countries, in explaining global capital flows. Our analysis introduces a new force: we demonstrate the importance of a country-specific factor ("Country Risk") in explaining capital flows. Third, because our country risk measures are based on granular firm-quarter-level data, we can decompose these aggregate findings into its source. We find that it is the perception by foreign firms rather than domestic firms that explains the patterns of capital inflows and sovereign credit spreads.

Having demonstrated the importance of country risk in explaining country-level asset prices and capital flows, we then turn to examining its importance for firm-level outcomes. In particular, we demonstrate that elevated country risk is associated with reductions in firm-level investment and employment of firms based in the country. This result holds even conditional on the firm's own perceived risk as well as on firm and year fixed effects. We view this as providing strong evidence that fluctuations in perceived country risk are an important determinant of real firm outcomes, above and beyond firm-specific uncertainty.

We then move beyond the direct effect of a firm's home country risk on corporate investment and employment and examine the transmission of foreign country risk across borders. Our key finding is that firm-level exposure to foreign risks affect firm level outcomes; moreover, it is highly heterogeneous and not well approximated by publicly observable financial variables. In particular, we introduce a firm-quarter level measure we call "Transmission Risk" which operationalizes in a straightforward way a given firm's exposure to risks emanating from foreign countries at a given point in time. We demonstrate that when a firm's transmission risk increases, it reduces its investment and employment, and experiences declines in its stock returns. This occurs above and beyond not just fluctuations in country risk of the firm's own home country, but also the firm's own measured risk. This provides clear evidence that perceived foreign risks spill over to both real decisions and the financial value of firms around the world. Notably, we show evidence that this kind of contagion often operates through complicated exposures that are not well-approximated by customer-supplier relationships or the firm's observable foreign investments. In this way, we demonstrate that contagion (the spillover of foreign country risk on firm-level outcomes) is an important driver of firm decisions.

The granularity of our measures allows us to then analyze the nature of this pattern of contagion – or the firm-level transmission of global risk – by examining which firms are relatively more exposed to different countries around the world. We demonstrate that the patterns of transmission of risk around the world follow a gravity structure, with firms on average worrying more about risks in countries geographically closer to them, that speak the same language, and which were in a colonial relationship.

Finally, we use our novel measures of country and global risk to add to the literature on the connection between global risk and exchange rates (Lustig et al., 2011). We demonstrate that heterogeneous loadings on our text-based measure of global risk explain a large fraction of the cross-sectional variation in exchange rate movements and currency returns. Most notably, we provide direct evidence that the US dollar, the euro, and the Japanese yen systematically appreciate when global risk perceptions spike. These results provide strong evidence for a prominent theoretical literature, where our new measures of perceived risk allow us to examine the theories more directly than was previously possible.

**Related Literature** This paper contributes to four strands of the literature. First, we contribute to the literature on international asset pricing and global risk. Colacito and Croce (2011) demonstrate that common long-run risk across countries can explain a number of international finance puzzles. Colacito et al. (2018) characterize how common risk to long-run growth news can reconcile the patterns of international capital flows with the data. Gourio et al. (2013) theoretically examine the implication for asset prices and exchange rates if countries have heterogeneous loadings on global risk. Gourio et al. (2015) examine how fluctuations in political risk can rationalize patterns in international capital flows. Bekaert et al. (2013) demonstrates that looser monetary policy reduces risk aversion and uncertainty.

Rey (2015) and Miranda-Agrippino and Rey (2020) demonstrate how fluctuations in global risk generate common movement in asset prices and macroeconomic activity around the globe. Relative to the existing literature, we are able to precisely define and measure risk associated with a given country and use our micro-founded measure to reexamine some of these classic questions.

The second branch of the literature studies the determinants of global capital flows and sudden stops. Calvo et al. (1996) demonstrated the importance of shocks emanating from global financial centers for fluctuations in capital flows to emerging markets, emphasizing the importance of "push factors" in the determination of global capital flows. Fratzscher (2012) examines the importance of these push and pull factors during the period of the global financial crisis. Forbes and Warnock (2012) and Broner et al. (2013) examine the determinants of movements in gross capital flows. We use our new measures of country risk to demonstrate the importance of the perceptions of country-specific risk in driving global capital flows, with these perceptions predominantly coming from firms and investors based in large developed countries. We therefore bridge the gap between these push-and-pull factors by showing the importance of a country-specific risk factor that comes from the measurement of the beliefs of a common set of global firms and investors.

Third, a large empirical and theoretical literature studies the effects of micro and macro uncertainty on asset prices investment, employment growth, lobbying, and the business cycle within the United States and other countries (Bloom et al., 2007; Bloom, 2009; Bachmann et al., 2013; Jurado et al., 2015; Handley and Limao, 2015; Giglio et al., 2016; Koijen et al., 2016; Kelly et al., 2016; Mueller et al., 2017; Bloom et al., 2018; Besley and Mueller, 2018; Hassan et al., 2019; Bekaert et al., 2019). We add to this literature by showing that fluctuations in country risk account for substantial variation in international capital flows and asset prices across countries, and by tracing transmission of country risk across borders to granular exposures at the firm-level. In addition, our findings are consistent with a prominent narrative in the policy-oriented literature that foreigners' perceptions of country risk directly affect local outcomes, particularly in emerging markets.

Fourth, we contribute to the growing literature that applies natural language processing in macroeconomics and related fields. In particular, we contribute to the subset of this literature that generates measures of risk from text, for example, Baker et al. (2016) use newspapers to measure economic policy uncertainty by counting the daily number of newspaper articles featuring the words 'economic,' 'policy,' and 'uncertainty.' Hassan et al. (2019) use the transcripts of earnings conference calls to measure firm-level political and non-political risk in the United States, and Ahir et al. (2018) use the Economist Intelligence Unit (EIU) country reports to construct country-level indices of economic uncertainty by counting the frequency of synonyms for risk or uncertainty within these reports. We differ from these existing approaches in three respects. First, basing our measures on hundreds of thousands of firm-quarter-level documents allows us to flexibly decompose perceptions of domestic and foreign agents, and those of sub-groups of decision makers, for example those at financial and non-financial firms. Second, these decompositions then enable us to understand directly from the underlying text what events drive a given peak in risk, and to document the transmission of country risk across borders, by measuring this transmission directly at the firm-level. Third, using conditional rather than unconditional word-counts we are able to separate the role of risk (the second moment) from that of positive and negative shocks (the first moment).

Finally, we contribute to the literature on contagion and the international propagation of shocks. Forbes (2012) surveys this large literature, highlighting the challenge in a common definition of contagion. Forbes and Rigobon (2002) examine whether higher stock market correlations during crises represents contagion or high levels of interdependence. Huo et al. (2019) and Baqaee and Farhi (2019) explore the importance of country-specific shocks and the transmission of common shocks around the world. We introduce a new measure of the transmission of global risk by precisely measuring how much global decision makers talk about specific countries, and asking whether firms discussing foreign countries see their investment and employment respond more to fluctuations in perceptions of the riskiness of the country in question. By beginning with firm-level variation, we are able to explore the transmission of global risk at varying degrees of disaggregation. For instance, we are able to examine which types of country risk are more likely to affect financial firms and which are more likely to be transmitted to the non-financial corporate sector.

The structure of the paper is as follows. Section 2 introduces the data. Section 3 discusses the methodology, validates the new measures, and introduces a number of new stylized facts about the nature of country risk and sentiment. Section 4 looks at the aggregate effects of country risk and section 5 zooms in at the firm level. Section 6 introduces transmission risk and characterizes the global contagion of risk. Section 7 explores the connection between risk and exchange rate movements. Section 8 concludes.

## 2. Data

### *2.1. Conference Call Transcripts*

The core of our dataset is the complete set of 306,589 English-language earnings conference call transcripts from Refinitiv EIKON from 2002-2020. These conference calls cover 11,865 firms that are headquartered in 82 countries. Generally, firms will have four calls per years, timed to coincide with earnings releases. A standard conference call takes the form of a management presentation followed by a question and answer with the firm's analysts. On average, the calls last around 45 minutes. In order to prepare the earnings call transcripts for analysis, we first remove all metadata such as title, date, speaker names with the goal of keeping only spoken text from the earnings call transcripts. We also remove all non-alphabetic characters, but do not force words to be lower case in order to facilitate the subsequent country name matching.

Appendix Table 1 summarizes our country coverage. Of the 11,831 firms, 6,457 are headquartered in the United States. The next three countries with the highest coverage are Canada, the United Kingdom, and Australia with 885, 528, and 401 firms, respectively. This ordering reflects our focus on English language transcripts and, of course, firms headquartered in English-speaking countries are more likely to conduct their conference calls in English. Nevertheless, as seen in the table, there are 28 countries for which we cover at least 40 firms in sample, reflecting a wide range of coverage of our dataset. In addition, the largest firms are disproportionately likely to appear in our dataset. In this sense, one can best think of our measure as capturing the concerns of multinational firms and global investors.

### *2.2. Country-Specific Training Libraries*

A key step in measuring country risk is to identify when the conference calls are focusing on particular countries. To do so, we assemble a training library $\mathbb{T}^c$ for each of our $c = 1, \ldots, 45$ countries.

By far the most important sources for our training library are the Country Commerce Reports published by the Economist Intelligence Unit. The Economist describes these reports as follows: "This report is a practical guide to a country's business regulations and business practices. The service covers 56 countries' rules in critical areas such as setting up a business, human resources, incentives, taxes, and intellectual property. It will allow you to get to grips with all key regulations and also to assess how ongoing regulatory changes will affect your organisation."[1] The reports offer a number of important advantages. First, because the reports are designed to cover the key economic institutions of the country's covered, they include a range of terminology relevant to each country. Second, the reports take a standardized form, allowing us to reliably compare across country reports. Third, because the reports are released regularly, they allow us to add new terms to our training library as they enter into the discourse. Of the 56 countries for which Country Commerce Reports exist, we restrict our analysis to the largest 45 economies, collectively covering 90.6% of world GDP in 2014. For each of these 45 countries, we obtain all reports for 2002-2019, remove non-alphabetic characters, and collect the remaining text in a single training library.

To this library we append all variants of the name of the country (i.e. "United States" and "USA"), as well as the names of towns with more than 15,000 inhabitants in 2018, and all administrative subdivisions in the country from geonames.org. In addition, we include all adjectival and demonymic forms of the country name from Wikipedia and the CIA World Factbook.

We then use these training libraries to identify adjacent two-word combinations (bigrams) most associated with discussions of a given country. To this end, we employ a simple pattern-based sequence-classification method, which identifies bigrams relating to a given country using the interaction two terms (Sparck, 1972; Salton and McGill, 1983; Salton and Buckley, 1988).[2] The first is the the bigram's relative frequency in the training library of country c; the second is the bigram's inverse frequency across training libraries – a penalty for bigrams

[1] See `https://store.eiu.com/product/country-commerce`.

[2] We could in principle substitute this approach with more advanced machine learning techniques which also allow researchers to infer how relevant a given phrase $b$ is in discussions of country $c$. For example, Gentzkow et al. (2019) or Davis et al. (2020) use text inverse regression (developed by Taddy (2013, 2015) and further extended by Kelly et al. (2019)) to identify relevant phrases in a different context. We believe that in our context the more traditional approach is preferable because of its simplicity and the ease with which it allows us to directly analyze the underlying text.

that also appear in the training libraries of many other countries:

$$\omega(b,c) = \frac{f_{b,T^c}}{B_{T^c}} \times \log(45/f_{b,\mathbf{c}}), \tag{1}$$

where $f_{b,T^c}$ denotes the frequency of bigram $b$ in the training library of country $c$, $B_{T^c}$ is the total number of bigrams in the same training library, and $f_{b,\mathbf{c}}$ is the number of training libraries in which $b$ occurs at least once. The first term, commonly denoted term frequency (tf), thus simply gives more weight to bigrams frequently used in C's training library. The second term, commonly denoted inverse document frequency (idf), gives more weight to bigrams that are used predominantly in discussions of a given country and do not also occur in discussions of most other countries. For example, while the bigram "Brussels and" may be frequent in the training library for Belgium, it also appears in the training libraries of many other EU countries, so that we might deem this mention less informative about whether or not a given text excerpts contains discussions of Belgium.

Finally, to make allowance for the fact that countries and places are often described by single words (unigrams) and our training libraries may not contain all relevant combinations of these unigrams with other words, we separately construct a weight for all unigrams contained in the list of country and place names mentioned above using the same formula (1). We then use this (unigram-based) weight as a minimum weight for all bigrams that contain the unigram in question.

Table 1 gives intuition for the workings of our algorithm by showing the top 20 bigrams by tf-idf in our training library for Greece, Turkey and Japan. While for each country the variants of country name are among the most important bigrams "Greek", "in Turkey", "in Japan"), we can see how successful the Economist Intelligence Country Commerce Reports are in identifying important country-specific phrases. For instance, in Panel A for Greece, we see that the sixth most important bigram is "ND government," a short-hand referring to the "New Democracy" center-right political party. Similarly, for Turkey we see that the third most important bigram is "Gazette No" and "Official Gazette" capturing the Gazette, which is the official publication form in Turkey for new legislation and other official announcements. In the case of Japan, we see that the fifth and seventh bigrams for Japan are "Industry METI" and "the METI," references to the powerful Ministry of Economy Trade and Industry. In all of these cases, these phrases or short-hand would be obvious to experts in the area, but there would be no ex ante way to say which political parties or ministries would have their names abbreviated in conversation and which would be stated in full. Our approach is able to systematically extract the expertise embedded in the country commerce reports and then use them to identify the country in question far more extensively than simply waiting for a call participant to say "Greece" or "Japan."

## 3. Measuring Country Exposure, Risk, and Sentiment

### 3.1. Measuring Firm-Level Country Risk and Sentiment

With our country-specific training libraries in hand, we can turn to the actual measurement of firm-level exposure to foreign countries and the risk and sentiment they associate with those foreign countries. Our simplest measure of country exposure counts the number of occurrences of bigrams indicative of conversation about country $c$, weights with $\omega(b,c)$, so that bigrams that we can more confidently ascribe to a given country receive more weight, and divides by the total number of bigrams in the transcript:

$$Exposure_{i,c,t} = \frac{1}{B_{it}} \sum_{b}^{B_{it}} \omega(b,c),$$

where $b = 0, 1, ...B_{it}$ are the bigrams contained in call of firm $i$ at time $t$.

For our benchmark measure of country risk, we then follow Hassan et al. (2019) by conditioning the count of bigrams indicative of conversations about country $c$ on close proximity to a synonym for risk or uncertainty:[3]

$$Risk_{i,c,t} = \frac{1}{B_{it}} \sum_{b}^{B_{it}} \{1[|b-r| < 10] \times \omega(b,c)\},$$

where $r$ is the position of the nearest synonym of risk or uncertainty. Appendix Table 2 lists the top 100 risk synonyms.

Finally, we construct equivalent measure of country sentiment, but instead of conditioning on the bigram appearing close to a synonym for risk, we count positive or negative tone words

[3]We obtain all synonyms for risk, risky, uncertain, and uncertainty from Oxford Dictionary.

("sentiment") used in conjunction with these country-specific bigrams

$$Sentiment_{i,c,t} = \frac{1}{B_{it}} \sum_{b}^{B_{it}} \left\{ \left( \sum_{g=b-10}^{b+10} S(g) \right) \times \omega(b,c) \right\},$$

where the function $S$ assigns +1 to positive tone words and -1 to negative tone words included in the library of tone words provided by Loughran and McDonald (2011). Appendix Table 3 lists the top 100 positive and negative sentiment words.

### *3.2. Aggregate Country Risk and Sentiment*

Having constructed firm-level measures of country risk and sentiment, we next turn to aggregating these measures to the country level. All of our aggregations of country risk take the general form

$$CountryRisk_{c,t}^{k} = \frac{1}{|k|} \sum_{i \in k} Risk_{i,c,t}$$

where $k$ defines a set of firms with a similar characteristic. The power of our procedure comes from the fact that we begin with firm-level data. While we will primarily focus on aggregations that use data from all firms with available data, we also construct average risk perceptions among particularly relevant subsets of firms.

The widest definition, and the one we primarily use through the paper, is where $k$ refers to any firm with a conference call transcript. However, while this is the natural place to start the analysis, the methodology allows for different levels of disaggregation that we will utilize throughout the paper. For instance, we will restrict $k$ to firms that are *not* headquartered in country $c$.[4] We refer to this measure as "NHQ" and find it to be of particular interest because it corresponds very closely to the risk perceptions of foreign investors. We could equivalently restrict to domestic firms only, "HQ," in order to compare foreign and domestic risk perceptions.[5] In addition, we construct different indices for financial firms and non-financial corporates. More generally, these measures can be modified for the question at hand, and one could easily construct a country risk measure for firms in a particular industry (such

[4] Our analysis uses the headquarter country of a firm, rather than the legal incorporation to more closely map to economic decision-making. See Coppola et al. (2020) for a detailed discussion of these issues.

[5] While theoretically appealing, we do not analyze this in detail because for many countries we have a limited and selected set of firms with conference call transcripts.

as energy), state-owned firms, or firms with a headquarters in a tax haven. By beginning our aggregate analysis with rich firm level data, we view this methodology as opening the door for a wide range of future analysis of the nature of country risk and sentiment.

Table 2 presents summary statistics for our various measures of country risk and country sentiment. To facilitate the interpretation of regression coefficients, we divide each measure by its standard deviation in the panel. In addition, the table presents summary statistics for the key financial and macroeconomic variables that we will use for the validation of our measures and the empirical analysis.

### *3.3. Validation*

Before turning to analysis, we validate our measure both at the micro-level and the aggregate.

In Table 3, we validate our training libraries more systematically beginning with our firm-level exposure measure. In particular, we regress $Exposure_{i,c} = (1/T)\sum_t Exposure_{i,c,t}$ on firm-level variables that should be expected to lead a firm to have a material exposure to a country. Therefore, if our text-based exposure measure is behaving as it should, we would it expect to to covary strongly with firm-level exposure measures based on accounting data. The first variable we consider is whether the firm in question is headquartered in country $c$. We measure this variable using the most recent `loc` variable from Computstat, which indicates the country of the headquarter of a firm. Second, we classify whether firm $i$ reports sales to country $c$ at any time. If a country is an important export market for a firm, we would expect them to discuss that particular country more during their earnings calls. To measure this variable, we use the Geographic Segment data from Worldscope. This data is extracted from annual reports, where under GAAP and IFSR accounting rules, firms need to report all sales destinations where they earn more than 10% of their revenue or have a "material interest." We therefore classify the firm as having a segment data link if the country is listed in this report. However, this coarse measure will miss a lot of export markets, as a firm may choose, for instance, to report having 20% of its sales to "Asia" rather than reporting 9% to Japan, 9% to China, and 2% to Thailand. In this instance, we would not classify the firm as having sales links to China or Japan because these sales relationship would not necessarily be disclosed. The regressions in Table 3 provide strong confirmation for our measure. Firms are 3.5 times more exposed to their headquarter country than other firms and firms with a sales link in the segment data are 1.2 times more exposed than other firms.

Having confirmed the validity of our measures at the firm-level, we next validate the performance of our aggregate measures of country risk. Figure 1 shows the time series of Greek country risk. The gray shaded area shows the average for Greek country risk using all firms in our sample, while the yellow shaded area shows only the part of the variation accounted for by financial firms. Below the graph, we show key text snippets that have received a high weight in earnings calls of firms that showed a large increase in the risk they associate with Greece during each of these episodes.[6] In our applications below, we will make systematic use of these high-impact snippets of text to identify macroeconomic or political events that contribute to each large spike in perceived country risk. For now, however, note that these snippets indeed highlight key events of the European debt crisis, beginning with the initial realization in the second quarter of 2010 that Greece had misreported its debts and that foreign banks are significantly exposed to a potential Greek default. The second peak coincides with the second bailout and imposition of a haircut for private holders of Greek debt in the fourth quarter of 2011; and the third with Syriza's referendum and the possibility of a Greek Exit from the European Monetary Union. Consistent with the financial nature of these crises, much of the increase in perceived Greek risk is driven by financial firms during each of these episodes.

We find similar success in Figure 2, where we turn to Turkey. In this case, we see the major spikes in Turkish Risk come from the Global Financial Crisis (which was also clearly visible in Figure 1), the attempted coup against President Erdogan in the second quarter of 2016, and the fears of a currency crisis in the fourth quarter of 2018. Interestingly, comparing the gray and yellow shaded areas shows that the political crisis surrounding the attempted coup caused relatively more concern among non-financial firms than financial firms – in sharp contrast with patterns we saw during the consecutive Greek sovereign debt crises. When we turn to the high-impact snippets reported below the table, we again see that the firms are actually discussing and concerned about the events in question.

The final validation of the country-level data is to confirm that our measures co-move as

[6] We select these snippets from the top 30 snippets with the highest weight after pooling and sorting all snippets from the top 100 firms with the highest level of $CountryRisk_{i,c,t}$ for country $c$ in quarter $t$.

expected with stock prices. In Panel A of Table 4, we demonstrate that when Country Risk is higher and Country Sentiment is lower the realized volatility of the local stock market is significantly elevated. We strongly confirm this with and without country and quarter fixed effects. For example, in column 3, we find that a one standard deviation increase in country risk is associated with a one percentage point increase in quarterly volatility – corresponding to an 10% increase relative to the sample mean; while a one standard deviation increase in country sentiment is associated with a drop in volatility of about half that amount. In Panel B of Table 4, we turn to stock returns and find that when country risk increases or country sentiment decreases, the value of the aggregate stock market significantly falls. For example, in column 3, a 1% increase in country risk is associated with a 0.2 percentage point drop in stock market valuation (measured in local currency units). That is, countries' stock prices drop and become more volatile when they are perceived to become riskier.

### *3.4. Properties of Country Risk and Sentiment*

With our quarterly time series in hand for 45 countries across 18 years, we now turn to establishing some stylized facts about the nature of country risk and sentiment. We begin by characterizing the mean of country risk and sentiment across countries. Recent work, such as Rey (2015) and Miranda-Agrippino and Rey (2020) has emphasized the co-movement of global risk across countries, where "risk" generally is measured as the common component of asset price movements. Here, we are able to take a more direct approach by measuring global risk – the mean of country risk. Figure 3 plots the the common series for global risk. A number of features of global risk are immediately apparent. First, we identify two major spikes: the global financial crisis and the recent global pandemic. In addition, the Great Moderation (i.e Bernanke (2004), Galí and Gambetti (2009)) is visible in the time series, with global risk from 2002-2006 lower than the entire period since the Global Financial Crisis.[7]

We then directly measure the extent to which country risk covaries across countries. In particular, we see that the first principal component of global risk explains 65.4% of country level variation. Similarly we find that that the first principal component of country sentiment explains 89% of the variation in country sentiment. We therefore provide strong evidence in

[7]An alternative approach to measuring global risk using our methodology is simply to average $Risk_{it}$ across all firms in our sample. Doing so produces a graph that is nearly identical to Figure 3, with a correlation of 81% between the two series.

favor of the arguments on the importance of common fluctuations in global risk. We return to this issue in section 7, where we show direct evidence that these global co-movements give rise to a strong factor structure in exchange rates.

In addition we find that country risk and sentiment are quite persistent at the country level, with quarterly autoregressive coefficients of 0.922 and 0.933, respectively. Country risk is strongly countercyclical, with cyclicality measured using country level real GDP growth rates. By contrast, country sentiment is pro-cyclical. Finally, while country risk and sentiment covary negatively, there is a significant difference between them. In particular, the mean within-country correlation of country risk and sentiment is -.28.

### *3.5. Country Risk and Crises*

In this section, we use our Country Risk measure to examine the recent history of each of the 45 countries in our sample. In doing so, we find it useful to use a standardized definition of when a country is in a "crisis," as perceived by global investors and executives. In particular, we consider a country to be in a crisis when its perceived level of country risk is at least 2 standard deviations above the sample mean. For each of these episodes we then read all high-impact snippets of text of the top 30 firms with the highest increase in risk they associate with the country and label the episode to summarize firms' predominant concerns at the time. While the threshold of 2 standard deviations is clearly arbitrary, it is straightforward for future users of the data to change this threshold according to their specific research question or policy objective.

In Table 5, we plot the aggregate time series of country risk of the 21 countries that have a local crisis according to our definition, with the ordering reflecting the number of quarters spent in a local crisis. Appendix Table 5 reports the equivalent graphs for all countries without a local crisis. A local crisis is defined as a period when the country in question is above the two standard deviation threshold but the world is not. In sample, the two global crises we have is the Global Financial Crisis (2008q4-2009q2) and the Covid-19 pandemic (2020q2-q3). These are marked with gray dots in each of the graphs. In addition to identifying crises at the country level, we use a firm level regression to systematically classify them into disproportionately driven by concerns among financial firms or not. If we find such a disproportionate rise among financials we mark the local crisis with a hollow red circle, while all other local crises are marked with a solid red bullet.[8]

The table shows a number of notable features. First, the series for most countries show clearly the impact of the two global crises in our sample, although there is also substantial idiosyncratic variation. Second, for almost all of these crises, a clear narrative emerges from reading the discussions between executives and investors, so that we are able to clearly label the vast majority of episodes. As expected, many of the countries with the largest number of local crises are emerging markets. Aside from Greece and Turkey, Brazil, Russia, and Thailand are at the top of the list. Brazil records its first local crisis surrounding Latin American crisis of 2002 and the subsequent election of Lula da Silva, as well as a long-period of upheaval surrounding the corruption scandals and recession of 2015-2016. Russia shows a long period of uncertainty surrounding the Crimean crisis 2014-15 and the concurrent devaluation of the ruble. In Thailand, the flood of 2011-12 features prominently, followed by the coup of 2014. Other headline-grabbing episodes picked up by our measures of country risk include the Hong Kong protests of 2019-20, Middle East wars, Brexit, the Egyptian revolution of 2011, and the Fukushima disaster.

Aside from these prominent episodes, the table also shows more subtle patterns. The first are less headline-grabbing, but nevertheless important sources of commercial risk. For example, in 2007-8, the Alberta provincial government debated increasing royalties for resource extraction, which became a major issue for energy firms invested in the region. Similarly, we record a few episodes (notably for Canada, Norway, and Poland), where firms discuss local risks that are not tied to a single event at all. We label these instances "co-occurrence of local concerns," where for example for Poland in 2020q1 Banca Comerical Portugues SA discusses higher capital charges related to currency risk from to mortgages issued in Swiss francs, Stock Spirits Group PLC worries about the possibility of an alcohol excise tax, and UNIQA Insurance Group AG lament the "fluctuating" competitive environment in Poland. Such seemingly random co-occurrences are of course more likely to sway measured country risk for smaller countries that have relatively fewer international firms doing business there.

Second, although none of the firms in our sample are based in Iran, and only two in Venezuela, we are nevertheless able to measure meaningful variation in commercial risk

[8] For a given crisis, we regress demeaned firm level Country Risk on an indicator of whether the firm is a financial firm with SIC code between 6000 and 6800. If the coefficient on the dummy variable is positive and statistically significant, we say that the local crisis is disproportionately driven by financials.

emanating from these countries, because some of our sample firms maintained commercial interests in these countries. The first of these is the 2003 oil strike in Venezuela, an attempt by the Venezuelan opposition to oust Hugo Chavez. The second is the failed Iranian Green Revolution of 2012. These examples also highlight an important feature of our approach: because we rely on discussions of investors and executives at globally listed firms, all of our measures will only be sensitive to variation in risk that affects those global businesses. The less connected a country is to these businesses, the less sensitive we expect our measures to become.

## 4. The Aggregate Effects of Country Risk

In this section, we turn to examining the relationship between country risk and asset prices, capital flows, and firm-level investment and employment decisions. In Table 6, we examine the relationship between country risk and a number of key financial market variables. In the first column of Panel A, we demonstrate that increases in country risk coincide with increases in realized stock market volatility. In particular, across all sample countries, a one standard deviation increase in country risk is associated with a 1 percentage point increase in realized volatility of daily returns. The effects are not limited to the equity market, as we see in column 2 that the same increase in country risk coincides with sharply elevated sovereign default risk, as measured by the sovereign CDS spreads. We see an insignificant increase in the bond yield in column 3. In the final column, we see that elevated country risk is associated with sharp drops in total inward portfolio flows, a relationship we study in more detail below. Throughout these specifications, more positive country sentiment is associated with lower volatility, lower CDS spreads, and lower bond yields. In Panel B we, re-run all of the specifications restricting the sample to be limited to emerging markets.[9] In every case, we see stronger effects for emerging markets than we did for the full sample of countries.

In Table 7, we dig deeper into country risk as a driver of global capital flows. There is a large literature, beginning with Calvo et al. (1996), that documents the relative importance

[9] Emerging markets are the intersection of the countries in our data and the S&P Emerging Broad Market Index as of October 2020 (Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Philippines, Poland, Russia, South Africa, Taiwan, Saudi Arabia, Thailand, and Turkey) plus Argentina, Iran, Nigeria, and Venezuela.

of push (i.e. global or source-country) factors and pull (i.e. recipient country specific) factors driving capital flows. Generally, the literature has documented the relative importance of push factors, where capital flows contract in response to bad global news but with little of the variation explained by local factors. In column 1, we run a univariate regression of gross portfolio inflows to a country scaled by the stock of foreign portfolio holdings on Global-Risk (conditional on country fixed effects), and observe that inflows drop significantly when GlobalRisk is elevated. In column 2, we include CountryRisk. The coefficient on GlobalRisk turns statistically insignificant, while the coefficient on CountryRisk is negative and statistically significant, demonstrating the importance of country specific variation in risk: A one standard deviation increase in a country's risk is associated with 1.1 percentage point drop in inflows – corresponding to a 50% reduction in inflows relative to the sample mean. In column 3, we control for country-specific GDP growth, a traditional pull factor. Consistent with the findings in the existing literature, this additional variable remains insiginficant. By contrast, we see that the coefficient on CountryRisk remains largely unaffected and highly statistically significant. In column 4, we introduce quarter fixed effects and see that the effect of country risk on capital inflows is essentially unchanged, even when we condition out all possible global variation in push factors. In column 5, we add CountrySentiment to the specification. As expected, we find that more positive views of a country (more positive sentiment) is associated with a marginally significant increase in capital inflows (0.516, s.e.=0.281), while the coefficient on CountryRisk remains stable (-0.857, s.e.=0.236).

In Table 8, we unpack our aggregate country risk series to better understand the sources of its explanatory power. In Panel A, we continue our examination of capital inflows. The first column reproduces our baseline specification. Next, we look at the effect of Country Risk measured by summing only across $CountryRisk_{i,c,t}$ of all firms headquartered in the United States. We find that the coefficient of interest is only slightly attenuated and now slighlty less precisely estimated (-0.901, s.e.=0.435). Column 3 instead averages across all firms that do have their headquarters in the country of interest ("NHQ"), in this sense, focusing only on the perceptions of foreigners. We again find a similar coefficient (-0.807, s.e.=0.308). That is, conditioning only on the perceptions of decision makers at US or foreign firms makes little difference for the coefficient of interest.

In column 4, we introduce a new control denoted $\overline{FirmRisk_{i,t}}_{c,t} := (1/N) \sum_{i \in c(i)} FirmRisk_{i,t}$, where $FirmRisk_{i,t}$ is the normalized unconditional count of risk synonyms in firm $i$'s earnings call during quarter $t$ (Hassan et al., 2019). This captures the total risk as perceived by firms based in the country, regardless of where this risk is coming from. Remarkably, adding this control does not attenuate the coefficient on $CountryRisk^{NHQ}$, which actually increases in magnitude, while the coefficient on $\overline{FirmRisk_{i,t}}_{c,t}$ remains statistically indistinguishable from zero. This finding shows clearly that our procedure conditioning on which country executives and investors are talking about, rather than simply averaging mentions of risk by firms in a given country, is key for the informativeness of our measures. In Column 5, we instead control for country risk as perceived by the firms based in that particular country, by averaging $CountryRisk_{i,c,t}$ for all $i$ with their headquarters in $c$. While this variable has some statistical significance, the overwhelming share of the explanatory power is coming from foreign rather than domestic risk perceptions.

While it is entirely conceivable that this pattern arises because perceptions of domestic agents ($CountryRisk^{HQ}$ and $\overline{FirmRisk_{i,t}}_{c,t}$) are measured with more error than foreigners' perceptions of a country's riskiness ($CountryRisk^{NHQ}$), it also suggests that foreigners' perceptions may be an important variable in and of itself. That is, our results are consistent with the widely held view among policymakers that foreigners' perceptions of a country's riskiness(particularly those of decision makers at global firms) are important drivers of capital flows in and of themselves.

Finally, column 6 contrasts the information content of our measure of country risk with another text-based measure, the World Uncertainty Index compiled by Ahir et al. (2018). Rather than operating on firm-level texts, this alternative measure simply counts the frequency of synonyms of risk and uncertainty directly in the Economist Intelligence Unit Country Commerce Reports. While this alternative measure is positively correlated with ours (the within-country correlation is 0.11), controlling for it changes our coefficient of interest only slightly.

In Panel B of Table 8, we run the same set of regressions but with sovereign CDS spreads as the dependent variable. Once again, we find that the bulk of the explanatory power comes from firms based outside the country. In fact, the results overall are even starker than in Panel A: the level of country risk as perceived by firms headquartered in the country and the World Uncertainty Index have no significant explanatory power once $CountryRisk^{NHQ}$

is included in the regression. This again speaks to the idea that both global capital flows and asset prices may partly be driven by perceptions of decision makers based outside the country in question.

Putting all this together, we provide a more nuanced interpretation of the drivers of global capital flows than the canonical push-pull dichotomy. While we find very strong explanatory power coming from a country-specific variable, Country Risk, it is a country specific variable capturing the perceptions of global firms and executives. Therefore, we do find that it is the country specific risk as perceived by foreigners that drives global capital flows, but whether to think of it as a pull factor, because it is recipient country specific, or a push factor, because it is capturing the beliefs and perceptions of a common set of investors outside of the country itself, is a matter of interpretation.

## 5. The Firm-level impact of Country Risk

Having demonstrated the robust relationship between country risk and the financial side of the economy, we now turn to examining its connection to the real side of the economy. In particular, we ask the question of whether increases in country risk coincide with declines in firm-level investment and employment. Importantly, we want to see whether country risk matters for firm level investment and employment decisions above and beyond the firm's own risk perception. Therefore, we introduce a new variable, $FirmRisk_{i,t}$, measuring each firm's risk perception without conditioning on any country training libraries. We then run a series of regressions of the form

$$y_{i,t} = \delta_i + \delta_t + \delta_c + \beta CountryRisk^{NHQ}_{c(i),t} + \gamma FirmRisk_{i,t} + X'\zeta + FE_{i,t} + \epsilon_{i,t}$$

where $y_{i,t}$ is either the log of firm $i$'s investment rate at time $t$ or the change in firm $i$'s total employment between $t$ and $t-1$, and $\delta_i$, $\delta_c$ and $\delta_t$ stand for firm, country, and time fixed effects, respectively. We consider investment in Panel A and employment in Panel B of Table 9.

In column 1, we begin by omitting $CountryRisk^{NHQ}_{c(i),t}$ from the regression, and only including $FirmRisk_{i,t} + FE_{i,t}$ and Country and Sector fixed effects. We see that Firm Risk enters negatively and strongly significantly. In column 2, we add our variable of interest

$CountryRisk^{NHQ}_{c(i),t}$. While the coefficient on $FirmRisk_{i,t} + FE_{i,t}$ is largely unchanged, we see that the coefficient on $CountryRisk^{NHQ}_{c(i),t}$ is negative and significant. What is striking about this result is that this means that changes in country risk are associated with drops in employment and investment by firms based in the country in question *above and beyond* any risk perceptions of the firm itself. Even more striking, the country risk measure we are using is "NHQ" version, meaning it is entirely a measure of foreign investors perceptions that are covarying negatively with firm-level investment and employment decisions. In Column 3, we further tighten the specification by adding time fixed effects. While this cuts the coefficient on country risk in half, it remains strongly economically and statistically significant for both investment and employment. Therefore, this is capturing fluctuations in country risk not just conditional on risk perceptions at the firm level, but also global movements in country risk perceptions. Finally, in column 4, we include firm fixed effects, thereby controlling for time-invariant firm level differences between investment and employment, as well as risk. The effect of $CountryRisk^{NHQ}_{c(i),t}$ continues to be economically and statistically significant, demonstrating the strong explanatory power of this risk above and beyond firm risk, aggregate risk, and time-invariant firm characteristics.

## 6. Transmission Risk

We now turn to using our new methodology to examine how risk is transmitted around the world. Our aim is provide a precise measure of transmission of country risk across borders and ask how successful this measure is at explaining firm-level decisions. In particular, we define

$$TransmissionRisk^{NHQ}_{i,t} = \sum_{c \neq c(i)} Exposure_{i,c,t} \times \widetilde{CountryRisk}_{c,t}$$

where $\widetilde{CountryRisk}_{c,t}$ is the residual from a regression of $CountryRisk_{c,t}$ on country and time fixed effects.

This firm-level measure is designed to capture how much each firm's risk increases because of increases in country risk around the world, excluding its home country. It is a weighted average of country risk in each country, where the weights correspond to that particular firm's exposure to risk in each country. Firm-level exposure to each country is measured using Equation 1.[10] Therefore, consider the effect of a sharp increase in Turkey's country risk. If there are two firms – in a given foreign country, one of them frequently refers to Turkish bigrams during its conference calls, but another firm rarely refers to Turkey, then we will record a sharp increase in the Transmission Risk of the firm exposed to Turkey but little to no increase in the Transmission Risk of the firm that rarely refers to Turkey.

To fix ideas, we begin by asking how much of the variation in overall firm-risk among our sample firms can be accounted for by transmission risk. In particular, we project firm-level risk on Transmission Risk and the risk associated with firm i's home country

$$Risk_{it} = \alpha + \beta_i TransmissionRisk^{NHQ}_{i,t} + \gamma_i CountryRisk^{NHQ}_{c(i),t} + \epsilon_{i,t}.$$

We find that the incremental $R^2$ of the former variable is 18%, while both variables jointly account for 34% of the variation. That is, on average, risks transmitted from foreign countries collectively account for about as much of the variation in a firm's overall risk as does its own-country risk.

Next, we use our measures to ask whether fluctuations in Country Risk around the world are useful in explaining firm level investment, employment and stock prices above and beyond that firm's own perceived risk or country risk in the firm's home country. In Table 10, Panel A examines the response of investment, Panel B employment, and Panel C stock returns. In column 1, we regress each of these three variables on $TransmissionRisk^{NHQ}_{i,t}$ and $CountryRisk^{NHQ}_{c(i),t}$, along with Firm and Year fixed effects. Across all three specifications, we see a robust and economically significant effect of transmission risk, with increases in transmission risk coinciding with reductions in investment, employment, and stock returns. For example, in Panel A, a one standard deviation increase in a firm's $TransmissionRisk^{NHQ}_{i,t}$ is associated with a 6.5 percent drop in the firm's investment rate.

In column 2, we further tighten the specification to look within country-year by including $Country \times Year$ fixed effects. These fixed effects fully absorb $CountryRisk^{NHQ}_{c(i),t}$, yet

[10] There are potentially many different ways to quantify transmission risk, and we explore them in detail in the appendix. In particular, Appendix Table 6 considers versions where we restrict the exposure weights to sum to one, where we hold these weight constant over time, and another where we directly sum up country risk at the firm-year level. All of these variations yield similar results.

the coefficient estimates on Transmission Risk remain largely unchanged. In column 3, we additionally control for $FirmRisk_{i,t}$ and once again the coefficient on Transmission Risk remains largely unchanged. Because $FirmRisk_{i,t}$ is directly measured from the conference call transcripts of the firm-quarter being examined, this means that we have sufficient power to separate empirically the effects of risks transmitted from foreign countries from the effects of fluctuations overall firm-level risk. This could happen for a number of reasons. In a few conference calls, the nature of all risks facing a firm will not be revealed or only be discussed briefly. Because Country Risk and Transmission Risk are measured using data from thousands of conference call transcripts, they may more accurately capture the nature of global risks facing a firm than can be elicited during any given conference call.

In columns 4 and 5 we re-estimate the latter two specifications, but include only firms with US headquarters in the regression. The coefficients estimated in this sub-sample tend to be somewhat larger than those in columns 1-3: We find that a one standard deviation increase in $TransmissionRisk_{i,t}^{NHQ}$ is associated with 11.6% decrease in the investment rate, a 1.9% percentage point decrease in hiring, and a 2.7 percentage point lower stock return (column 5). All estimates remain statistically significant at the 1% level in this sub-sample of US firms. Crises abroad and fluctuations in risk associated with foreign countries thus appears to significantly affect firm-level outcomes in the United States in a manner predicted by canonical theory.

Going one step further, in Appendix Table 7, we replace our exposure weights with information from the Worldscope Geographic Segment data on the country's sales share. While the sign continues to be negative on this alternative version of transmission risk, it is statistically insignificant. This speaks to the idea that the true nature of global interconnectedness is far more complicated that can be gleaned from accounting statements and speaks to a key advantage of measuring firm exposure using information on what the firm's themselves actually discuss during their earnings calls.

Having demonstrated the importance of the transmission of risk around the world, we now turn to understanding the heterogeneity in the exposure of firms to countries around the world. In Table 11, we zoom in on the top five origins of transmission risk for ten sectors within the United States. The third column of the table lists the firm with the largest transmission risk from each origin as an example. We can observe a large degree of heterogeneity in the countries driving transmission to the US by industry.

For example, major source countries of transmission risk for firms in the US technology sector are Canada, Japan, Ireland, China, and Israel; while firms in the US energy sector are concerned with risks associated with Canada, Mexico, Saudi Arabia, and Venezuela. Looking into the underlying conference call transcripts paints a rich picture of the commercial links underlying this variation. For example, Devon Energy's Canadian exposure stems from large holdings of conventional and unconventional oil resources in the country that it acquired in the 1990s and has been selling off in recent years. Schlumberger provides services for oil exploration, drilling, and production in Saudi Arabia, and has recently opened a manufacturing facility there. Exxon Mobil's activities in Nigeria include exploration for oil and deepwater production, while Conoco Philips is involved in litigation trying to claw back assets expropriated in Venezuela.

Interestingly, not all of the complex exposures are well-summarized by customer-supplier relations or asset holdings. For example, following the Fukushima nuclear disaster, we see extensive discussions of risks associated with the event among French firms in the nuclear industry that, according to our data, have neither significant sales nor direct holdings in Japan. Instead, these companies worry about how the events playing out in Japan may affect the future of the nuclear industry as a whole.

Finally, in Table 12, we can zoom out from the firm-level analysis and look at the top origins and destinations of transmission risk for countries around the world. From a cursory glance over the table, we can see the firms tend to worry more about risks originating in countries geographically closer to them. In addition, one can immediately see the importance of language and historical ties, with Australia worrying not only about nearby New Zealand but also about the United Kingdom. In Appendix Table 8 we confirm this conjecture more systematically. Building on the large literature in trade and international finance, we run a gravity regression of bilateral transmission risk. With source and destination fixed effects, we find that distance, geographical contiguity, common official language, and a historical colonial relationship are all significant explanatory factors for the transmission of global risk.

To add texture to this analysis, Figure 4 focuses only on the Greek Financial Crisis (2010-2012), the coup against Erdogan in 2016, and the Fukushima nuclear disaster of 2011.

It shows how risks from these crises are transmitted to firms across the globe. While the Greek crisis is of course transmitted predominantly to other EU countries, the Turkish coup raised most concerns among Russian and Italian firms, and the Fukushima disaster stands out for having disparate effects in all regions of the globe – ranging from Australian Uranium producers to the French component manufacturers already mentioned above, and insurance firms in Bermuda and Hong Kong.[11]

## 7. Country Risk, Global Risk, and Exchange Rates

In this final section, we use our measures to revisit the link between exchange rates and risk around the world. A large literature in international macroeconomics (Meese and Rogoff (1983), Rossi (2013)) has found that traditional fundamentals that theoretical models say should explain exchange rate movements are largely disconnected from currency movements in the data. A growing literature in international finance (Lustig et al. (2011), Lustig et al. (2014), Avdjiev et al. (2019), Jiang et al. (2018), Verdelhan (2018), and Lilley et al. (2019)) has instead focused on explaining exchange rate movements conditional on movements in global risk factors, such as a slope factor, the Libor CIP deviations, CIP devations between government bonds, the broad US dollar, global capital flows, and other risk factors. While it is difficult to forecast exchange rates unconditionally, there is evidence of a factor structure in exchange rates, with some countries loading more or less on variation in these global risk factors. However, a remaining challenge with to this literature is that the majority of the existing evidence is internal to asset prices. In this section, we explore this hypothesis, directly measuring fluctuations in global risk using our "global risk" measure described in detail in section 3. That is, rather than using factors constructed from asset returns, we relate exchange rate movements to variation in our text-based measure of global risk – relying on texts generated by global investors and executives.

We begin by examining how exchange rate movements correlate with our measure of global risk. We run a regression of the form

$$\Delta e_{c,t} = \alpha_c + \beta_c \cdot \Delta logGlobalRisk_t + \epsilon_{c,t}$$

[11] For a detailed analysis of the latter event also see Boehm et al. (2019), Hassan et al. (2020), and Carvalho et al. (2021).

where $\Delta e_{c,t}$ is the period-average change in the equal-weighted broad exchange rate.[12] Panel A of Figure 5 plots these $\beta$ coefficients for each of the currency-specific regressions with standard error bands. We see a large degree of heterogeneity across countries, providing direct evidence for the heterogeneous loading of currencies on global risk. In Panel B of Figure 5, we plot these estimated $\beta_c$ coefficients on the x-axis and the $R^2$ of the regression on the y-axis. We plot in gray the currencies that are relatively more managed or even pegged during the sample period.[13] We see that traditionally "risky" currencies, such as emerging market currencies like the Mexican peso and South African Rand as well as the carry currencies like the Australian dollar, have large negative betas on global risk, meaning they significantly depreciate when global risk increases. By contrast, among the floating currencies, it is only the relative safe-haven currencies of the Yen, Dollar and Euro that have their broad exchange rate load positively on global risk. Indeed, a large fraction of the variation in the broad Yen and Dollar are explained by the two currencies' heterogeneous loadings on global risk.

In panels (C) and (D) of Figure 5, we provide direct evidence for the idea that this heterogeneity in the loading on global risk can explain cross-country heterogeneity in nominal interest rates and excess returns. In particular, we see that currencies that depreciate in response to increases in global risk have significantly higher nominal interest rates. In addition, these heterogeneous loadings appear to be a priced risk factor, as those currencies that depreciate in response to spikes in global risk have earned significantly higher excess returns against the USD than do currencies that either appreciate or depreciate less. We view this as providing support for theories emphasizing cross-country heterogeneity in loadings on global risk as explaining persistent differences in interest rates and excess returns across currencies (i.e. Lustig et al. (2011), Lustig et al. (2014), Verdelhan (2018), Hassan (2013) and Richmond (2019)).

In the Appendix Figures 1 and 2, we replicate Figure 5 for Global Sentiment and for each

[12] Aloosh and Bekaert (2019) discuss the advantages of using the equal-weighted broad exchange rates, or "currency baskets."

[13] We use the de facto exchange rate classifications from Ilzetzki et al. (2019). We report currencies in green if the average Ilzetzki et al. (2019) rating from 2003 to the present averages at least a 12 in their "fine" classification. That means the currencies rank as least "De facto moving band +/-5% Managed floating" and report them in gray. We classify the Euro as floating rather than looking at the individual country classifications.

country's bilateral exchange rate against the US Dollar. We find a very similar cross-sectional pattern. In addition, we consider bivariate regressions, where we add the country-specific change in risk or sentiment in Equation 7. The results are reported in Appendix Tables 12, 13, and 14, for risk for the equal-weighted and US exchange rate, and for sentiment and the equal-weighted exchange rate, respectively. We see that heterogeneous loadings on global risk and sentiment explain a significantly larger amount of exchange rate changes than do country-specific changes in risk and sentiment. We see in these tables, and in Appendix Table 15, that country-specific sentiment changes explain a larger amount of the movements in individual currencies than does country-specific risk changes. Across all of these specifications, global risk and sentiment have similar explanatory power and a very similar cross-sectional pattern.

## 8. Conclusion

We introduce new measures of country risk and sentiment based on natural language processing of conference call transcripts of firms around the world. These measures allow us to present a novel characterization of risk and crises. Our new measures of country risk not only covary strongly with asset prices and country aggregates, but also help to explain firm-level variation in investment and employment. We use our new methodology to provide direct evidence for the ability of heterogeneous loadings on global risk to explain the pattern of currency risk premia.

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Table 1: Top 20 ngrams in the training library of Greece, Turkey, and Japan

| Ngram | tf×idf | Frequency | Countries | Ngram | tf×idf | Frequency | Countries |
|---|---|---|---|---|---|---|---|
| PANEL A: GREECE | | | | | | | |
| Greek | 607.86 | 3,470† | 15 | by Law | 79.83 | 511 | 21 |
| in Greece | 509.74 | 1,539 | 7 | the EA | 76.30 | 119 | 1 |
| Athens | 339.69 | 778† | 2 | The ND | 73.09 | 114 | 1 |
| Greece | 257.99 | 3,907† | 34 | New Democracy | 69.89 | 109 | 1 |
| Hellenic | 249.74 | 796† | 5 | Greeks | 64.76 | 153† | 1 |
| ND government | 130.16 | 203 | 1 | gov gr | 61.55 | 96 | 1 |
| Piraeus | 127.91 | 323† | 2 | Strategic Reference | 61.55 | 96 | 1 |
| Share sale | 88.48 | 138 | 1 | Attica | 59.63 | 133† | 1 |
| an AE | 80.79 | 126 | 1 | ministerial decisions | 59.20 | 127 | 3 |
| Thessaloniki | 80.68 | 208† | 2 | Alpha Bank | 58.35 | 91 | 1 |
| PANEL B: TURKEY | | | | | | | |
| Turkish | 805.23 | 3,237† | 16 | Turkey | 101.72 | 3,876† | 49 |
| in Turkey | 666.83 | 1,366 | 7 | the GDFI | 94.50 | 100 | 1 |
| Gazette No | 246.58 | 398 | 4 | an AS | 88.63 | 129 | 3 |
| Turk Eximbank | 171.04 | 181 | 1 | the Undersecretariat | 87.61 | 112 | 2 |
| Turkey has | 162.55 | 310 | 6 | Izmir | 82.21 | 108† | 1 |
| Ankara | 144.58 | 201† | 1 | the Directive | 76.57 | 135 | 5 |
| Official Gazette | 131.89 | 495 | 18 | in prioritydevelopment | 76.54 | 81 | 1 |
| of Turkeys | 128.48 | 187 | 3 | prioritydevelopment regions | 74.65 | 79 | 1 |
| Istanbul | 127.94 | 311† | 6 | in Turkeys | 73.71 | 78 | 1 |
| the lira | 114.34 | 121 | 1 | Undersecretariat of | 71.19 | 91 | 2 |
| PANEL C: JAPAN | | | | | | | |
| in Japan | 244.24 | 2,820 | 30 | Japan has | 93.04 | 412 | 11 |
| Economy Trade | 215.48 | 466 | 2 | the JPO | 86.58 | 155 | 1 |
| the JFTC | 207.23 | 371 | 1 | Japanese companies | 86.10 | 471 | 15 |
| Health Labour | 138.53 | 248 | 1 | the Diet | 86.02 | 154 | 1 |
| Industry METI | 136.29 | 244 | 1 | enterprise tax | 84.62 | 183 | 2 |
| the Japan | 129.97 | 608 | 12 | Standards Law | 83.66 | 206 | 3 |
| the METI | 115.63 | 207 | 1 | Japanese | 81.31 | 4,330† | 48 |
| The JFTC | 107.25 | 192 | 1 | Tokyo | 81.16 | 756† | 22 |
| Japan Fair | 98.31 | 176 | 1 | Antimonopoly Law | 78.73 | 215 | 4 |
| The Japan | 97.10 | 210 | 2 | Labour Standards | 75.81 | 207 | 4 |

*Notes:* This table lists the top 20 ngrams when sorted on $tf \times idf$ in the training library for three selected countries. Column 2 shows the $tf \times idf$ of the ngram, which is the frequency of the ngram in its country-specific library divided by the total number of ngrams in that library ($tf$) multiplied by the log of the number of country libraries divided by the number of country libraries that contain the ngram ($idf$); column 3 shows the frequency of the ngram in the country-specific library; and column 3 shows the number of country libraries with that ngram. A † indicates that the frequency includes any bigrams that have as one component the unigram at hand. A country-specific training library consists of (1) all adjacent two-word combinations (bigrams) from the country's Economist Country Commerce Reports published between 2002 and 2019; (2) all unigrams and bigrams from the country-specific Geonames list of country names, region names, and city names of cities with more than 15,000 inhabitants in 2018; and (3) all adjectival demonymic forms of the country name from Wikipedia dn the CIA World Factbook.

Table 2: Summary statistics

| Panel A: Firm-country | Mean | Median | St. Dev. | Min | Max | $N$ |
|---|---|---|---|---|---|---|
| $CountryExposure_{i,c}$ (std.) | 0.79 | 0.68 | 1.00 | 0.00 | 104.49 | 664,440 |
| $\mathbb{1}(Headquarter)_{i,c}$ | 0.02 | 0.00 | 0.13 | 0.00 | 1.00 | 664,440 |
| $\mathbb{1}(Segment\ data\ link)_{i,c}$ | 0.05 | 0.00 | 0.22 | 0.00 | 1.00 | 268,856 |
| **Panel B: Country-quarter** | **Mean** | **Median** | **St. Dev.** | **Min** | **Max** | **$N$** |
| $CountryRisk_{c,t}$ (std.) | 4.40 | 4.27 | 1.00 | 2.59 | 10.29 | 3,240 |
| $CountryRisk^{NHQ}_{c,t}$ (std.) | 5.70 | 5.64 | 1.00 | 3.51 | 12.15 | 3,240 |
| $CountryRisk^{HQ}_{c,t}$ (std.) | 0.48 | 0.18 | 1.00 | 0.00 | 12.52 | 2,838 |
| $CountrySentiment_{c,t}$ (std.) | 3.45 | 3.43 | 1.00 | -0.48 | 7.86 | 3,240 |
| $\overline{FirmRisk_{i,c,t}}_{c,t}$ (std.) | 3.16 | 3.00 | 1.00 | 0.62 | 12.21 | 2,256 |
| $Realized\ MSCI\ volatility_{c,t}$ | 0.10 | 0.09 | 0.06 | 0.02 | 1.16 | 2,961 |
| $\Delta\log(MSCI\ return\ index_{c,t})$ | 0.02 | 0.03 | 0.11 | -0.69 | 0.48 | 2,912 |
| $Inflows_{c,t}/stock_{c,t}$ | 0.02 | 0.01 | 0.06 | -0.31 | 1.33 | 2,936 |
| $Sovereign\ CDS\ spread_{c,t}$ (bp) | 202.45 | 74.77 | 578.13 | 0.90 | 10,350.00 | 2,747 |
| $Sovereign\ bond\ yield_{c,t}$ | 4.58 | 2.88 | 15.54 | -0.92 | 500.00 | 2,260 |
| $Real\ GDP\ growth_{c,t}$ | 0.93 | 1.05 | 5.89 | -26.48 | 29.24 | 2,882 |
| **Panel C: Firm-year** | **Mean** | **Median** | **St. Dev.** | **Min** | **Max** | **$N$** |
| $CountryRisk^{NHQ}_{c(i),t}$ (std.) | 6.14 | 6.24 | 1.00 | 3.29 | 8.11 | 90,323 |
| $FirmRisk_{i,t}$ (std.) | 1.21 | 0.98 | 1.00 | 0.00 | 18.01 | 93,725 |
| $End\text{-}of\text{-}year\ 52wk\ return_{i,t}$ | -0.01 | 0.07 | 0.60 | -10.89 | 4.98 | 89,550 |
| $\Delta\log(employment\ rate_{i,t})$ | 0.04 | 0.02 | 0.19 | -0.71 | 0.76 | 70,936 |
| $\log(investment\ rate)_{i,t}$ | -1.92 | -1.89 | 0.94 | -5.05 | 0.53 | 74,975 |
| $TransmissionRisk^{NHQ}_{i,t}$ | 3.95 | 3.76 | 1.00 | 0.00 | 17.57 | 93,725 |

*Notes*: This table shows the mean, median, standard deviation, minimum, maximum, and number of observations of all variables that are used in the subsequent regression analyses. Panels A, B, and C show the relevant statistics for the regression sample at the firm-country, country-quarter and firm-year unit of analysis, respectively. In Panel A, $CountryExposure_{i,c}$ *(std.)* is the average over time of firm $i$'s Country Exposure to country $c$, normalized by the standard deviation; and $\mathbb{1}(Headquarter)_{i,c}$ and $\mathbb{1}(Segment\ data\ link)_{i,c}$ are binary variables equal to one if firm $i$ is headquartered in country $c$ and reports sales to country $c$, respectively. In Panel B, $CountryRisk_{c,t}$ *(std.)* is the average for country $c$ and quarter $t$ of the Country Risk perceived by all firms as measured in their earnings call transcripts, normalized by the standard deviation in the panel; $CountryRisk^{NHQ}_{c,t}$ *(std.)* and $CountryRisk^{HQ}_{c,t}$ *(std.)* are the same but based on firms not headquartered headquartered in $c$ at $t$, respectively; $CountrySentiment_{c,t}$ *(std.)* is the average for country $c$ and quarter $t$ of Country Sentiment perceived by all firms, normalized by the standard deviation in the panel; $\overline{FirmRisk_{i,c,t}}_{c,t}$ *(std.)* is the average over all firms headquartered in country $c$ and quarter $t$ of risk words per word mentioned by the firm during its earnings call (restricted to countries for which we have at least five firms); $Realized\ MSCI\ volatility_{c,t}$ is the standard deviation of the daily MSCI stock return index for country $c$ during quarter $t$ (based on local currency), $\Delta\log(MSCI\ return\ index_{c,t})$ is the $t-1$ to $t$ change in log of the end-of-quarter MSCI stock return index (based on local currency) for country$c$ and quarter $t$; $Inflows_{c,t}/stock_{c,t}$ are inflows of equity and debt to country $c$ during quarter $t$ relative to the country's stock of capital in the previous quarter; $Sovereign\ CDS\ spread_{c,t}$ is the end-of-quarter 5-year sovereign CDS spread of country $c$ and quarter $t$ (in bp); $Sovereign\ bond\ yield_{c,t}$ is the end-of-quarter mid yield on a 1-year sovereign bond of country $c$ and quarter $t$ (in percent); and $Real\ GDP\ growth_{c,t}$ is the quarter-to-quarter percent change in real GDP of country $c$ and quarter $t$. In Panel C, $CountryRisk^{NHQ}_{c(i),t}$ *(std.)* is Country Risk of the country of headquarter of firm $i$, $c(i)$, in year $t$ as perceived by firms without headquarter in country $c$, normalized by its standard deviation in the panel; $FirmRisk_{i,t}$ *(std.)* is the number of risk words per word mentioned in any earnings call of firm $i$ in year $t$; $end\text{-}of\text{-}year\ 52wk\ return_{i,t}$) is the change in the log of one plus firm $i$'s end-of-year 52-week stock return; $\Delta\log(employment\ rate_{i,t})$ is the year-to-year difference in the log of employment, winsorized at the first and lst percentile; $\log(investment\ rate)_{i,t}$ is a the log of investment rate, which is calculated recursively using a perpetual-inventory method and winsorized at the first and last percentile; and $TransmissionRisk^{NHQ}_{i,t}$ *(std.)* is the weighted sum over countries of residualized $CountryRisk^{NHQ}_{c,t}$ with weights given by the firm's Country Exposure to country $c$ in quarter $t$, $CountryExposure_{i,c,t}$, normalized by its standard deviation in the firm-year panel.

Table 3: $CountryExposure_{i,c}$ correlates positively with measures of firm links

| | $Exposure_{i,c}$ (std.) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| $\mathbb{1}(Headquarter)_{i,c}$ | 2.322*** | | 2.653*** | 3.472*** |
| | (0.049) | | (0.085) | (0.102) |
| $\mathbb{1}(Segment\ data\ link)_{i,c}$ | | 0.968*** | 0.977*** | 1.247*** |
| | | (0.025) | (0.025) | (0.029) |
| $R^2$ | 0.091 | 0.033 | 0.120 | 0.163 |
| $N$ | 664,440 | 268,856 | 268,856 | 268,856 |
| Country FE | no | no | no | yes |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the firm-country level. All variables are as defined in Section 3. Column 4 includes country fixed effects. Standard errors are robust. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

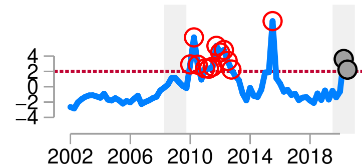
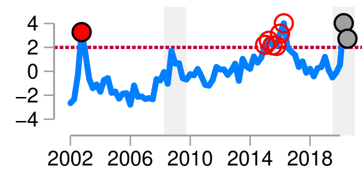
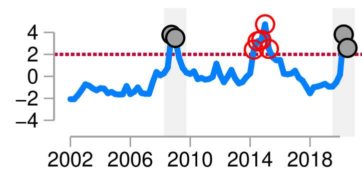
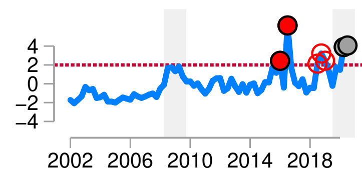
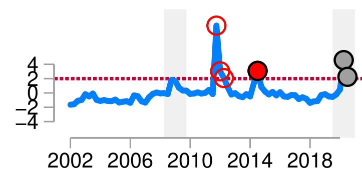
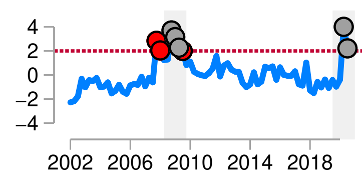
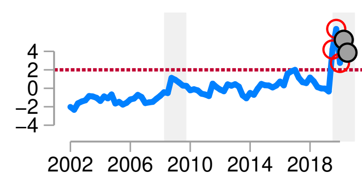
Table 4: Country Risk, Country Sentiment, and Stock Market Return and Volatility

| Panel A | *Quarterly realized* $vol_{c,t}$ | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| $CountryRisk_{c,t}$ (*std.*) | 0.006*** | 0.015*** | 0.010*** |
| | (0.001) | (0.002) | (0.002) |
| $CountrySentiment_{c,t}$ (*std.*) | | –0.025*** | –0.005** |
| | | (0.001) | (0.002) |
| $R^2$ | 0.010 | 0.302 | 0.526 |
| $N$ | 2,961 | 2,961 | 2,961 |
| Country FE | no | yes | yes |
| Year-quarter FE | no | no | yes |

| Panel B | $\Delta \log$ *MSCI return* $index_{c,t}$ | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| $\Delta \log(CountryRisk_{c,t})$ | –0.346*** | –0.206*** | –0.206*** |
| | (0.044) | (0.044) | (0.043) |
| $\Delta \log(CountrySentiment_{c,t})$ | | 0.191*** | 0.191*** |
| | | (0.019) | (0.019) |
| $R^2$ | 0.055 | 0.135 | 0.150 |
| $N$ | 2,888 | 2,884 | 2,884 |
| Country FE | no | no | yes |

*Notes*: This table shows regressions and standard errors from regressions at the country-quarter level. All variables are as defined in Section 3. Standard errors are robust. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

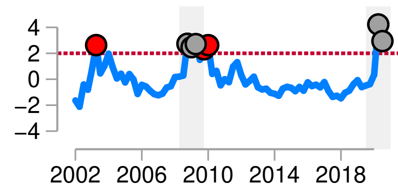
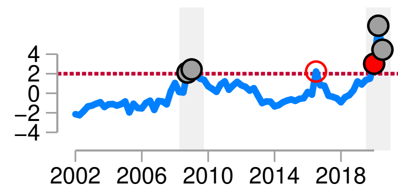
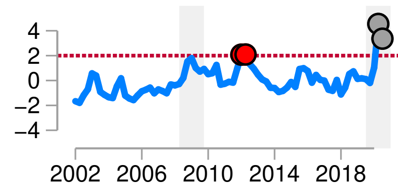
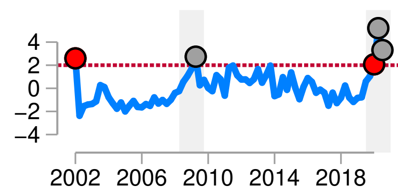
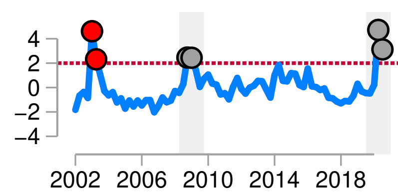
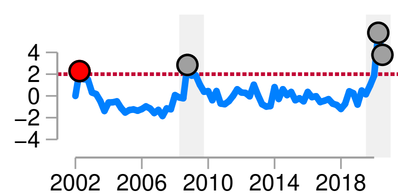
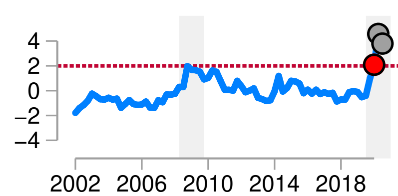
## Table 5: Identifying country crises

| Where and when | Description | Time series |
|---|---|---|
| **Greece** | |  |
| 2010q1-12q4 | Greece government-debt crisis | |
| 2015q3 | Referendum on Troika's bailout | |
| **Brazil** | |  |
| 2002q4 | Political uncertainty from elections in midst of economic crisis | |
| 2015q1-16q2 | Deep recession; political turmoil | |
| **Russia** | |  |
| 2014q2-15q2 | Oil price drop and Crimea spark ruble devaluation; financial crisis | |
| **Turkey** | |  |
| 2016q1 | Political turmoil | |
| 2016q3 | Attempted coup against Erdogan | |
| 2018q3-19q1 | Turkish currency and debt crisis | |
| **Thailand** | |  |
| 2011q4-12q2 | Flood disaster | |
| 2014q3 | Coup d'état by military | |
| **Canada** | |  |
| 2007q4-08q1 | Alberta government increases resource loyalties | |
| 2009q3 | Cooccurrence of local concerns | |
| **Hong Kong** | |  |
| 2019q3-20q1 | Hong Kong protests against bill allowing extradition to China | |

● Global crisis
● Local crisis
○ Local crisis with disproportionate rise among financials

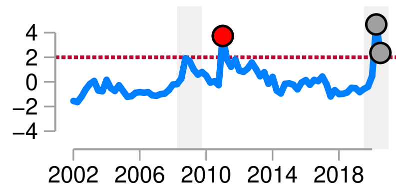
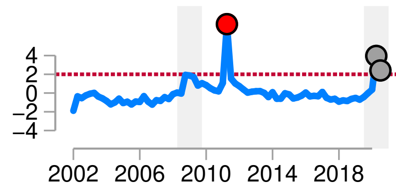
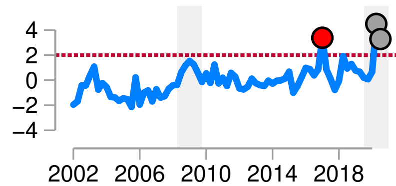
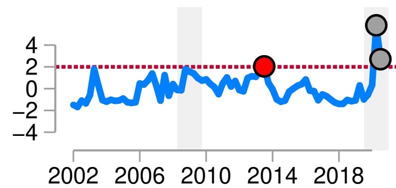
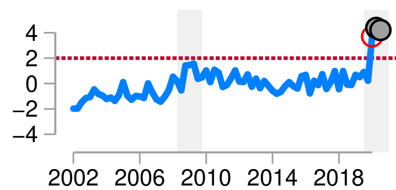
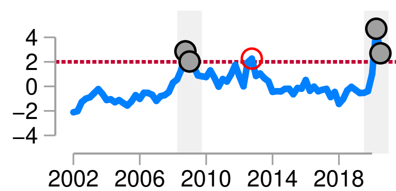
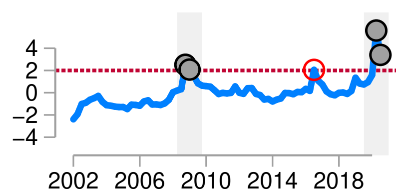
*Notes*: This table describes and plots country crises based on $CountryRisk_{c,t}$ for the country indicated in column 1. A global crisis is defined as $GlobalRisk_t$ being above two standard deviations (see also Figure 3); a local crisis is defined as the country's $CountryRisk_{c,t}$ being above two standard deviations in the panel (the red horizontal dashed line); and a local crisis with disproportionate rise among financials is defined as a local crisis for which a dummy for financial firms is positive and statistically significant in a firm level regression on the crisis quarter with demeaned $CountryRisk_{i,c,t}$ as the outcome. For Greece, we assume that 2010q4, which is just below the threshold of two standard deviations, is nevertheless part of the crisis that started in 2010q4.

Table 5: Identifying country crises (continued)

| Where and when | Description | Time series |
|---|---|---|
| **Israel** | |  |
| 2003q2 | Regional instability; Iraq war | |
| 2009q4-10q1 | Worries about strong shekel | |
| **Ireland** | |  |
| 2016q3 | Brexit referendum | |
| 2020q1 | Brexit (exit day); general elections | |
| **Iran** | |  |
| 2012q1-12q2 | Start of Green Movement's protests | |
| **Norway** | |  |
| 2002q1 | Cooccurrence of local concerns | |
| 2020q1 | Cooccurrence of local concerns | |
| **Venezuela** | |  |
| 2003q1-03q2 | Aftermath of oil strike | |
| **Argentina** | |  |
| 2002q2 | Political turmoil, peso; economic crisis | |
| **Chile** | |  |
| 2020q1 | Political turmoil; protests | |

Global crisis
Local crisis
Local crisis with disproportionate rise among financials

Table 5: Identifying country crises (continued)

| Where and when | Description | Time series |
|---|---|---|
| **Egypt**<br>2011q1 | Start of Egyptian revolution |  |
| **Japan**<br>2011q2 | Fukushima disaster |  |
| **Mexico**<br>2017q1 | NAFTA renegotiation after Trump's inaguration |  |
| **Nigeria**<br>2013q2 | Increased political instability |  |
| **Poland**<br>2020q1 | Coocurrence of local concerns |  |
| **Spain**<br>2012q4 | Spain's sovereign debt crisis; Troika bailout |  |
| **United Kingdom**<br>2016q3 | Brexit referendum |  |

Global crisis
Local crisis
Local crisis with disproportionate rise among financials

Table 6: Country Risk, Asset Prices, and Capital Flows

| Panel A: All countries | *Realized vol*$_{c,t}$ | *CDS spread*$_{c,t}$ | *Bond yield*$_{c,t}$ | *%Inflows*$_{c,t}$ |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| *CountryRisk*$_{c,t}$ *(std.)* | 0.010*** | 117.284** | 1.028 | –0.958*** |
| | (0.002) | (47.747) | (0.834) | (0.290) |
| *CountrySentiment*$_{c,t}$ *(std.)* | –0.005** | –362.036*** | –1.651*** | 0.342 |
| | (0.002) | (82.021) | (0.360) | (0.307) |
| $R^2$ | 0.526 | 0.423 | 0.172 | 0.132 |
| $N$ | 2,961 | 2,747 | 2,259 | 2,936 |
| Panel B: Emerging | *Realized vol*$_{c,t}$ | *CDS spread*$_{c,t}$ | *Bond yield*$_{c,t}$ | *%Inflows*$_{c,t}$ |
| | (1) | (2) | (3) | (4) |
| *CountryRisk*$_{c,t}$ *(std.)* | 0.015*** | 139.171* | 1.257 | –1.580*** |
| | (0.003) | (72.160) | (1.325) | (0.468) |
| *CountrySentiment*$_{c,t}$ *(std.)* | –0.009*** | –528.450*** | –2.453*** | 0.046 |
| | (0.003) | (128.273) | (0.685) | (0.516) |
| $R^2$ | 0.559 | 0.432 | 0.164 | 0.151 |
| $N$ | 1,521 | 1,513 | 1,139 | 1,512 |
| Year-quarter FE | yes | yes | yes | yes |
| Country FE | yes | yes | yes | yes |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the country-quarter level. Panel A is for all countries; panel B and C are restricted to emerging and developed markets, respectively. All variables are as defined in Table 2. Emerging markets are the intersection of the countries in our data and the S&P Emerging Broad Market Index as of October 2020 (Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Philippines, Poland, Russia, South Africa, Taiwan, Saudi Arabia, Thailand, and Turkey) plus Argentina, Iran, Nigeria, and Venezuela. Developed markets are the intersection of countries in our data and the S&P Developed Broad Market Index as of October 2020 (Australia, Belgium, Canada, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Portugal, Singapore, South Korea, Spain, Sweden, Switzerland, United Kingdom, United States). Standard errors are robust. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 7: Drivers of Capital Flows

| | $(Inflows_{c,t}/stock_{c,t-1})$*100 | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| *$CountryRisk_{c,t}$ (std.)* | | –1.084*** | –1.172*** | –1.024*** | –0.857*** |
| | | (0.301) | (0.165) | (0.261) | (0.236) |
| *$GlobalRisk_{t}$ (std.)* | –0.656*** | –0.229 | | | |
| | (0.090) | (0.149) | | | |
| *Real GDP $growth_{c,t}$* | | | –0.003 | 0.013 | 0.012 |
| | | | (0.013) | (0.014) | (0.015) |
| *$CountrySentiment_{c,t}$ (std.)* | | | | | 0.516* |
| | | | | | (0.281) |
| $R^2$ | 0.059 | 0.064 | 0.096 | 0.182 | 0.183 |
| $N$ | 2,936 | 2,936 | 2,796 | 2,796 | 2,796 |
| Country FE | yes | yes | yes | yes | yes |
| Year-quarter FE | no | no | no | yes | yes |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the country-quarter level. All variables are defined as in Table 2. Standard errors are robust. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 8: Decomposing Country Risk

| Panel A | $(Inflows_{c,t}/stock_{c,t-1})$*100 | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $CountryRisk_{c,t}$ (std.) | –1.067*** | | | | | |
| | (0.300) | | | | | |
| $CountryRisk^{US\ firms}_{c,t}$ (std.) | | –0.901** | | | | |
| | | (0.435) | | | | |
| $CountryRisk^{NHQ}_{c,t}$ (std.) | | | –0.807*** | –1.119*** | –0.771** | –0.781** |
| | | | (0.308) | (0.314) | (0.318) | (0.310) |
| $\overline{\text{FirmRisk}}_{i,t_{c,t}}$ (std.) | | | | –0.119 | | |
| | | | | (0.136) | | |
| $CountryRisk^{HQ}_{c,t}$ (std.) | | | | | –0.328** | |
| | | | | | (0.164) | |
| $World\ Uncertainty\ Index_{c,t}$ | | | | | | –0.931* |
| | | | | | | (0.547) |
| $R^2$ | 0.132 | 0.128 | 0.130 | 0.196 | 0.144 | 0.131 |
| $N$ | 2,936 | 2,936 | 2,936 | 2,163 | 2,710 | 2,936 |
| Panel B | $Sovereign\ CDS\ spread_{c,t}$ | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $CountryRisk_{c,t}$ (std.) | 225.188*** | | | | | |
| | (64.740) | | | | | |
| $CountryRisk^{US\ firms}_{c,t}$ (std.) | | 278.009** | | | | |
| | | (116.246) | | | | |
| $CountryRisk^{NHQ}_{c,t}$ (std.) | | | 239.585*** | 242.163*** | 190.481*** | 240.035*** |
| | | | (74.545) | (91.315) | (68.936) | (75.138) |
| $\overline{\text{FirmRisk}}_{i,t_{c,t}}$ (std.) | | | | –11.018 | | |
| | | | | (13.860) | | |
| $CountryRisk^{HQ}_{c,t}$ (std.) | | | | | 12.217 | |
| | | | | | (9.058) | |
| $World\ Uncertainty\ Index_{c,t}$ | | | | | | –17.849 |
| | | | | | | (52.306) |
| $R^2$ | 0.391 | 0.380 | 0.397 | 0.356 | 0.370 | 0.397 |
| $N$ | 2,747 | 2,747 | 2,747 | 1,960 | 2,500 | 2,747 |
| Year-quarter FE | yes | yes | yes | yes | yes | yes |
| Country FE | yes | yes | yes | yes | yes | yes |

*Notes*: This table shows coefficients and regression coefficients from regressions at the country-quarter level. All variables are defined as in Table 2. Standard errors are robust. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 9: Foreign Risk Perceptions, Investment and Employment

| PANEL A | log(*investment rate*$_{i,t}$) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| $CountryRisk^{NHQ}_{c(i),t}$ *(std.)* | –0.069*** | –0.167*** | –0.095*** |
| | (0.008) | (0.019) | (0.018) |
| $FirmRisk_{i,t}$ *(std.)* | –0.053*** | –0.051*** | –0.043*** |
| | (0.008) | (0.008) | (0.007) |
| $R^2$ | 0.044 | 0.073 | 0.511 |
| $N$ | 72,472 | 72,472 | 71,644 |
| PANEL B | $\Delta$ log(*employment*$_{i,t}$) | | |
| | (1) | (2) | (3) |
| $CountryRisk^{NHQ}_{c(i),t}$ *(std.)* | –0.033*** | –0.018*** | –0.012*** |
| | (0.002) | (0.004) | (0.004) |
| $FirmRisk_{i,t}$ *(std.)* | –0.009*** | –0.009*** | –0.009*** |
| | (0.001) | (0.001) | (0.001) |
| $R^2$ | 0.020 | 0.026 | 0.233 |
| $N$ | 68,351 | 68,351 | 67,243 |
| Country FE | yes | yes | n/a |
| Sector FE | yes | yes | n/a |
| Year FE | no | yes | yes |
| Firm FE | no | no | yes |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the firm-year level. All variables are defined as in Table 2. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 10: The Transmission of Country Risk

| | All firms | | | US firms | |
|---|---|---|---|---|---|
| Panel A | log(*investment rate*$_{i,t}$) | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| $TransmissionRisk^{NHQ}_{i,t}$ (std) | –0.065*** | –0.065*** | –0.064*** | –0.118*** | –0.116*** |
| | (0.008) | (0.008) | (0.008) | (0.013) | (0.013) |
| $CountryRisk^{NHQ}_{c(i),t}$ (std.) | –0.098*** | | | | |
| | (0.019) | | | | |
| $FirmRisk_{i,t}$ (std.) | | | –0.038*** | | –0.047*** |
| | | | (0.007) | | (0.010) |
| $R^2$ | 0.511 | 0.525 | 0.526 | 0.499 | 0.500 |
| $N$ | 71,644 | 73,741 | 73,741 | 47,175 | 47,175 |
| Panel B | $\Delta$ log(*employment*$_{i,t}$) | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| $TransmissionRisk^{NHQ}_{i,t}$ (std) | –0.010*** | –0.009*** | –0.008*** | –0.020*** | –0.019*** |
| | (0.002) | (0.002) | (0.002) | (0.003) | (0.003) |
| $CountryRisk^{NHQ}_{c(i),t}$ (std.) | –0.014*** | | | | |
| | (0.004) | | | | |
| $FirmRisk_{i,t}$ (std.) | | | –0.008*** | | –0.011*** |
| | | | (0.001) | | (0.002) |
| $R^2$ | 0.233 | 0.244 | 0.244 | 0.236 | 0.237 |
| $N$ | 67,243 | 69,484 | 69,484 | 45,766 | 45,766 |
| Panel C | *log return*$_{i,t}$ | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| $TransmissionRisk^{NHQ}_{i,t}$ (std) | –0.012*** | –0.014*** | –0.013*** | –0.028*** | –0.027*** |
| | (0.004) | (0.004) | (0.004) | (0.008) | (0.008) |
| $CountryRisk^{NHQ}_{c(i),t}$ (std.) | 0.016* | | | | |
| | (0.009) | | | | |
| $FirmRisk_{i,t}$ (std.) | | | –0.012*** | | –0.013*** |
| | | | (0.003) | | (0.005) |
| $R^2$ | 0.382 | 0.404 | 0.404 | 0.377 | 0.377 |
| $N$ | 85,111 | 88,166 | 88,166 | 53,832 | 53,832 |
| Year FE | yes | n/a | n/a | yes | yes |
| Firm FE | yes | yes | yes | yes | yes |
| Country×Year FE | no | yes | yes | n/a | n/a |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the firm-year level. All variables are defined as in Table 2. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

## Table 11: Top five origins of transmission risk for ten selected US sectors

| Firms in US sector | Worry most about | S&P 500 firm in sector with highest worry |
|---|---|---|
| Basic Materials | Canada | Mosaic Co (Chemicals) |
| | Brazil | FMC Corp (Chemicals) |
| | Mexico | WRKCO Inc (Applied Resources) |
| | Australia | Newmont Goldcorp Corp (Mineral Resources) |
| | Argentina | Dow Inc (Chemicals) |
| Consumer Cyclicals | Canada | TJX Companies Inc (Retailers) |
| | Mexico | Mohawk Industries Inc (Cyclical Consumer Products) |
| | Brazil | Whirlpool Corp (Cyclical Consumer Products) |
| | Japan | Tiffany & Co (Retailers) |
| | Australia | News Corp (Cyclical Consumer Services) |
| Consumer Non-Cyclicals | Canada | Molson Coors Brewing Co (Food & Beverages) |
| | Mexico | Walmart Inc (Food & Drug Retailing) |
| | Brazil | Corteva Inc (Food & Beverages) |
| | Argentina | Corteva Inc (Food & Beverages) |
| | Australia | Constellation Brands Inc (Food & Beverages) |
| Energy | Canada | Devon Energy Corp |
| | Mexico | Halliburton Co |
| | Saudi Arabia | Schlumberger NV |
| | Nigeria | Exxon Mobil Corp |
| | Venezuela | ConocoPhillips |
| Financials and Real Estate | Canada | Weyerhaeuser Co (Real Estate) |
| | Greece | State Street Corp (Banking & Investment Services) |
| | New Zealand | Arthur J Gallagher & Co (Insurance) |
| | United Kingdom | People's United Financial Inc (Banking & Investment Services) |
| | Mexico | Kimco Realty Corp (Real Estate) |
| Healthcare | Japan | Cooper Companies Inc (Healthcare Services & Equipment) |
| | Canada | Laboratory Corporation of America Holdings (Healthcare Services & Equipment) |
| | Israel | AbbVie Inc (Pharmaceuticals & Medical Research) |
| | Ireland | West Pharmaceutical Services Inc (Healthcare Services & Equipment) |
| | Australia | Resmed Inc (Healthcare Services & Equipment) |
| Industrials | Canada | W W Grainger Inc (Industrial Goods) |
| | Mexico | Kansas City Southern (Transportation) |
| | Brazil | Deere & Co (Industrial Goods) |
| | Australia | Rollins Inc (Industrial & Commercial Services) |
| | India | A. O. Smith Corp (Industrial Goods) |
| Technology | Canada | CDW Corp (Software & IT Services) |
| | Japan | IPG Photonics Corp (Technology Equipment) |
| | Ireland | Analog Devices Inc (Technology Equipment) |
| | China | Qorvo Inc (Technology Equipment) |
| | Israel | Citrix Systems Inc (Software & IT Services) |
| Utilities | Canada | NiSource Inc |
| | Mexico | Sempra Energy |
| | United Kingdom | Eversource Energy |
| | New Zealand | Ameren Corp |
| | Belgium | WEC Energy Group Inc |

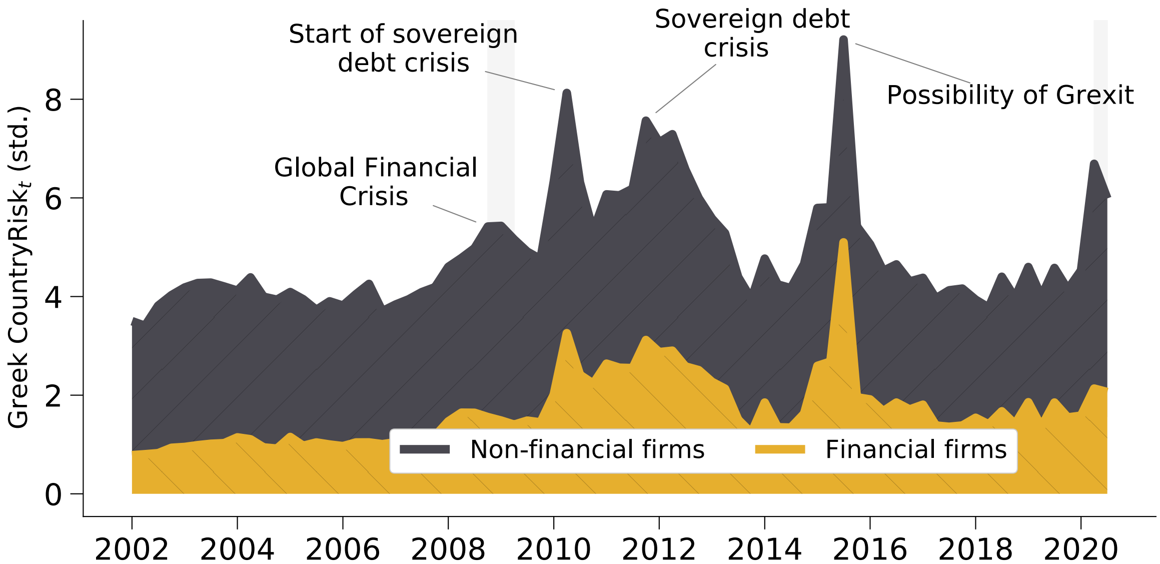
*Notes*: This table lists for for nine US sectors (column 1) the country they worry most about (column 2), and the S&P firm in that sector with the highest worry (column 3). The ranking in column 2 is based on summing the relevant components of $TransmissionRisk_{i,t} := \sum_{c \neq c(i)} CountryExposure_{i,c,t} \times \widetilde{CountryRisk}_{c,t}$ for sector-country pairs, and sorting the resulting countries for a given sector. For example, for sector-country pair $(s, c)$, we take the sum over all firms in sector $s$ of the relevant components about country $c$: $\sum_{i \in s, c=c} CountryExposure_{i,c,t} \times \widetilde{CountryRisk}_{c,t}$. The firm with the highest worry in column 3 is obtained similarly. The sector classification is from Thomson Eikon.

Table 12: Top five origins and destinations of transmission risk for selected countries

| Firms headquartered in | Worry most about | Firms that worry about | Are headquartered in |
|---|---|---|---|
| United States | Canada | Greece | Austria |
| | Mexico | | Belgium |
| | Brazil | | Italy |
| | Japan | | Spain |
| | Australia | | Switzerland |
| Canada | Mexico | Russia | Finland |
| | Australia | | Austria |
| | United States | | Turkey |
| | Chile | | Denmark |
| | Ireland | | Luxembourg |
| United Kingdom | Ireland | Brazil | Chile |
| | Australia | | Luxembourg |
| | Poland | | Spain |
| | Saudi Arabia | | Mexico |
| | Brazil | | Norway |
| Australia | New Zealand | Turkey | Greece |
| | United Kingdom | | Austria |
| | Indonesia | | Russia |
| | Ireland | | Italy |
| | Singapore | | Netherlands |
| China | Hong Kong | Thailand | Japan |
| | Taiwan | | Singapore |
| | Singapore | | Hong Kong |
| | Thailand | | Norway |
| | Japan | | China |
| India | Nigeria | Argentina | Chile |
| | Pakistan | | Luxembourg |
| | Brazil | | Spain |
| | Turkey | | Mexico |
| | Saudi Arabia | | Brazil |
| Japan | Thailand | Egypt | Greece |
| | Indonesia | | Turkey |
| | Taiwan | | Italy |
| | Singapore | | France |
| | India | | Netherlands |
| Germany | Russia | Iran | Turkey |
| | Poland | | Russia |
| | Turkey | | Greece |
| | Brazil | | South Africa |
| | Greece | | Japan |
| Sweden | Norway | Japan | South Korea |
| | Poland | | Hong Kong |
| | Russia | | Israel |
| | Spain | | Singapore |
| | Brazil | | France |
| Brazil | Argentina | Venezuela | Chile |
| | Colombia | | Mexico |
| | Chile | | Spain |
| | Mexico | | Luxembourg |
| | Venezuela | | Italy |

*Notes*: This table lists for ten countries where firms are headquartered (column 1), the top five countries those firms worry most about (column 2); it also lists for ten countries that firms worry about (column 3), the top five countries those firms are headquartered (column 4). The countries in columns 1 and 3 are hand selected from the countries where most firms are headquartered and from the countries with most crises in Table 5, respectively. The rankings in columns 2 and 4 are based on summing the relevant components of $\mathit{TransmissionRisk}_{i,t} := \sum_{c \neq c(i)} \mathit{CountryExposure}_{i,c,t} \times \widetilde{\mathit{CountryRisk}}_{c,t}$ for country-country pairs, and sorting the resulting lists. For example, for country-country pair $(c(i), c)$, we take the sum over all firms headquartered in country $c(i)$ of the relevant components about country $c$: $\sum_{i \in c(i), c=c} \mathit{CountryExposure}_{i,c,t} \times \widetilde{\mathit{CountryRisk}}_{c,t}$.

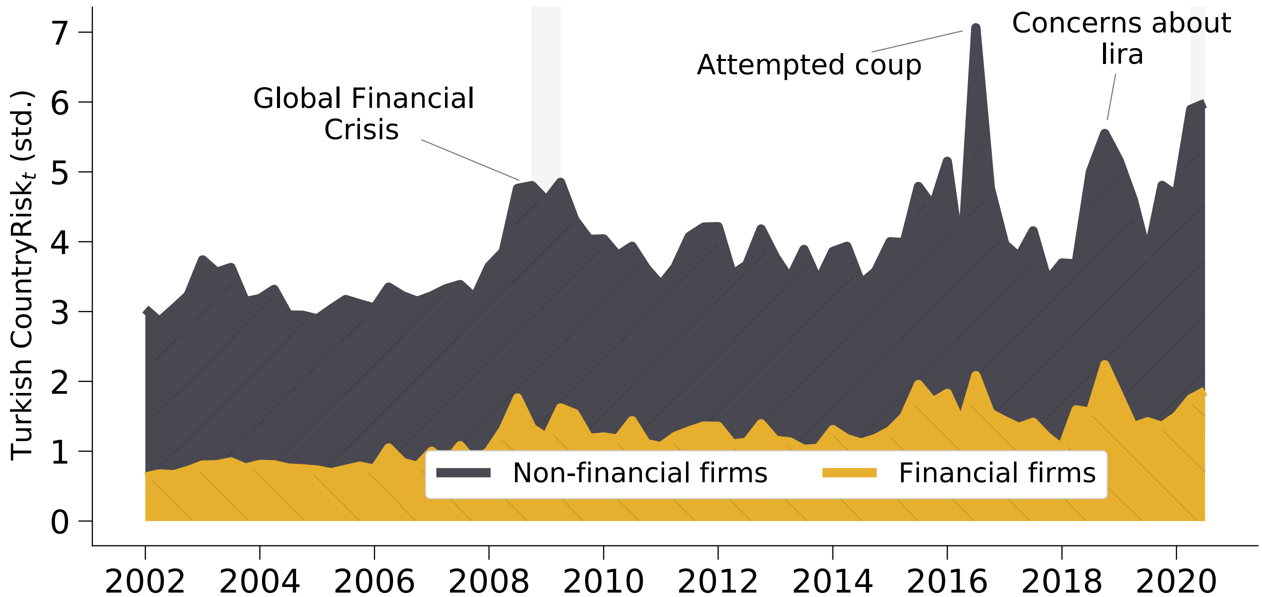
Figure 1: Time series of Greek Country Risk




| Summary | Example text excerpts from high-impact snippets |
|---|---|
| **Possiblity of Grexit** (2015q3) | "[...] concern related to the possible impact of a Greek eurozone exit has led to persistent volatility in currencies [...]" (BlackRock Inc, July 15, 2015)<br>"[...] we operate in Europe despite the uncertainties you know notably in Greece we are gradually witnessing a gradual acceleration in economic activity [...]" (Societe Generale SA, August 5, 2015) |
| **Start of sovereign debt crisis** (2010q2) | "Continued concerns about default risk in Greece and other countries in Europe will only cause more volatility [...]" (Eagle Rock Energy Partners LP, May 6, 2010)<br>"[...] of exposure to banking and sovereign risk in Greece, Italy, Spain, Portugal, and Ireland combined [...]" (National Bank of Canada, May 28, 2010) |
| **Sovereign debt crisis** (2011q4) | "[...] the European sovereign debt crisis and the likelihood of a Greek default It is critical that a concerted effort is carried out [...]" (Bankinter SA, October 21, 2011)<br>"[...] 'sovereign debt crisis producing gutwrenching market gyrations The threat of a Greek Spain and Italy default European Bank recapitalizations and financial contagion [...]" (Pzena Investment Management Inc, Oct 26, 2011) |

*Notes*: This figure plots the time series of Greek $CountryRisk_{c,t}$ as defined in 2 but decomposed into Country Risk as perceived by non-financial and financial firms, respectively. The latter are firms whose four-digit SIC code is in 6000−6800.

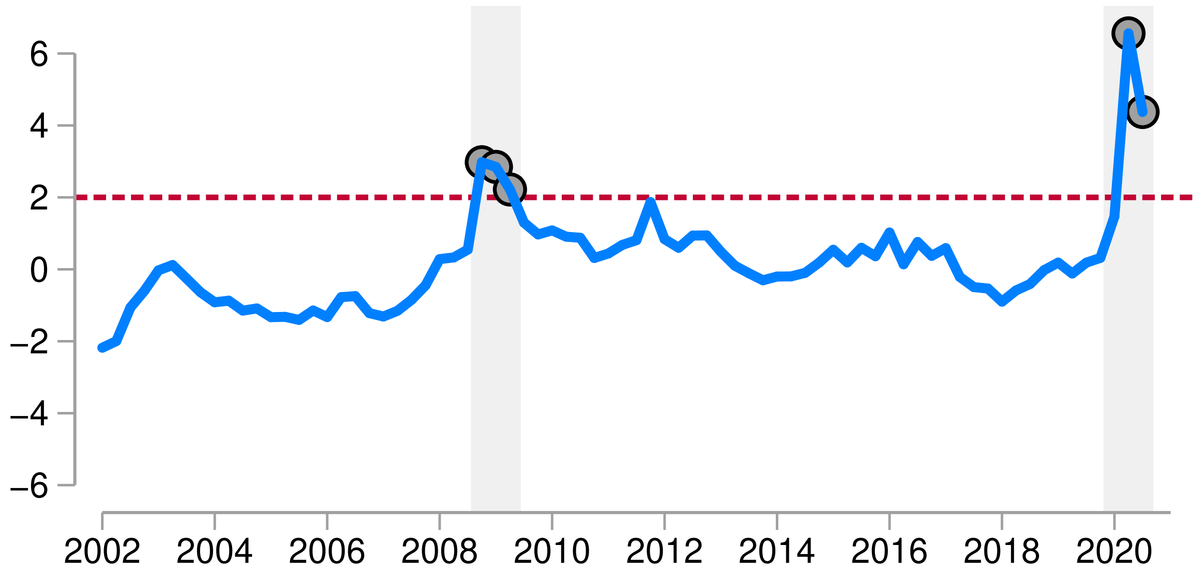
Figure 2: Time series of Turkish Country Risk




| Summary | Example text excerpts from high-impact snippets |
|---|---|
| **Fallout from Global Financial Crisis** | "[...] the environment was a very difficult environment and global issues Turkish political uncertainties regulation decisions all of this coming together created a [...]" (Turkcell Iletisim Hizmetleri AS, August 7, 2008)<br>"[...] some disruption lately What sort of risk assessment there in Turkey and Asia Is it calm or do you see any issues [...]" (Getinge AB, January 26, 2009) |
| **Attempted coup** (2016q2) | "[...] other side following the failed coup the geopolitical risk situation in Turkey increased too Hence we adjusted our expectation for the number [...]" (Fraport AG, August 4, 2016)<br>"[...] One of the key reasons is the increased geopolitical instability in Turkey Nonetheless however we grew organically in the first six months [...] (Stroeer SE & Co KGaA, August 11, 2016) |
| **Concerns about lira** (2018q4) | "[...] increasing interest rate level at the cost of risk situation in Turkey This was not fully offset by the growing contract volume [...]" (Daimler AG, October 25, 2018)<br>"[...] but were impacted by an intentional reduction in sales to Turkish customers in Q due to the currency risks On the yeartodate [...]" (Israel Chemicals Ltd, November 1, 2018) |

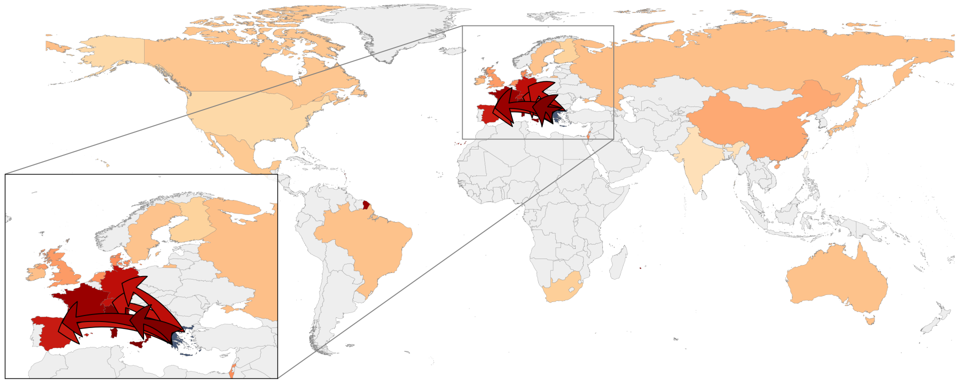
*Notes*: This figure plots the time series of Turkish $CountryRisk_{c,t}$ as defined in 2 but decomposed into Country Risk as perceived by non-financial and financial firms, respectively. The latter are firms whose four-digit SIC code is in 6000−6800.

Figure 3: Time series of $GlobalRisk_t$

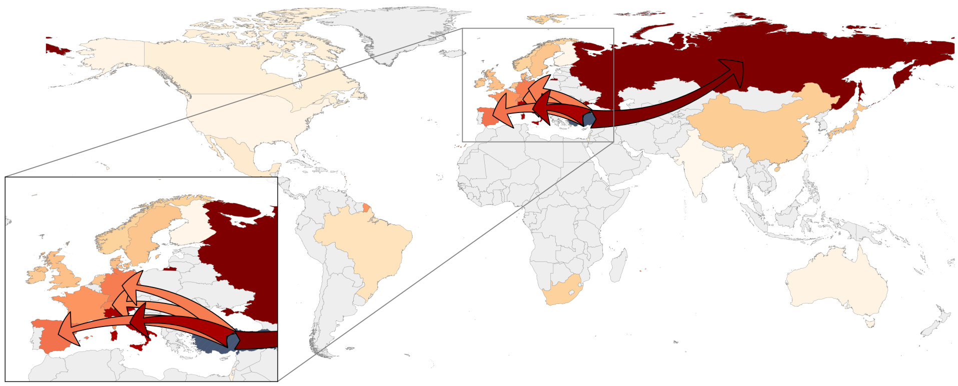



*Notes*: This figure shows the time series of $GlobalRisk_t$. Marked in gray are the quarters above two standard deviations (the red horizontal dashed line), which we define as global crises. For each $t$, $GlobalRisk_t$ is defined as the average across all countries of $CountryRisk_{c,t}$. The coefficients are standardized to have mean zero and standard deviation one for 2002q1-2019q4. NBER-based recession quarters are shaded in grey.

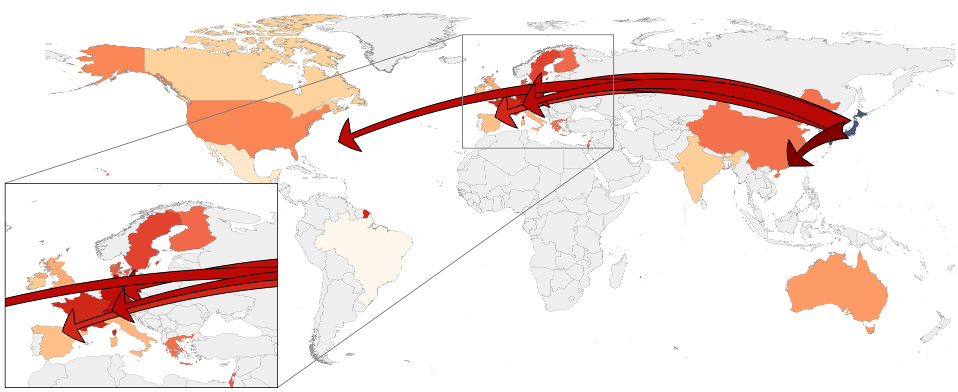
Figure 4: Country Risk transmitted through firm exposures: Three examples



(a) Greek crisis (2010-2012)



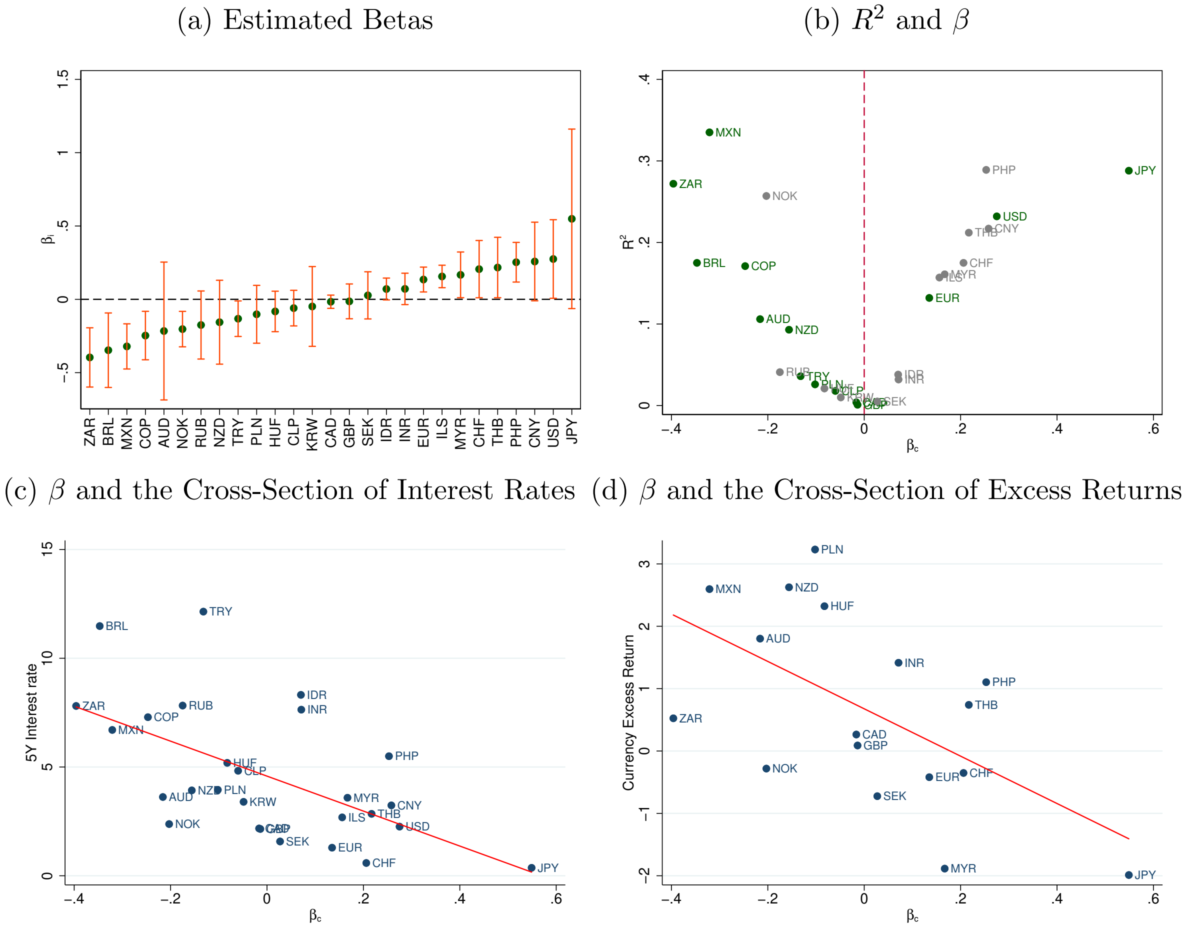
(b) Turkish coup (2016)



(c) Fukushima disaster (2011)

*Notes*: This figure plots the countries in which firms have the highest average $TransmissionRisk_{i,t}$ during the following three crisis episodes selected from Table 5: the Greek crisis in 2010-2012, the Turkish coup in 2016, and the Fukushima disaster in 2011. We also plot arrows to the top 5 countries with firms that have the highest average $TransmissionRisk_{i,t}$. For the Greek crisis, these are Italy, France, Germany, Switzerland, and Spain; for the Turkish coup, these are Russia, Italy, Spain, Germany, and Switzerland; and for the Fukushima disaster these are Hong Kong, Switzerland, Bermuda, Germany, and France. Darker colors indicate higher $TransmissionRisk_{i,t}$. Countries in grey indicate that we do not have $> 25$ firms headquartered in that country during the episode.

Figure 5: Exchange Rates and Global Risk: Equal-Weighted Broad Exchange Rate




Notes: This figure plots the coefficient $\beta_i$ for regressions of the form

$$\Delta e^B_{i,t} = \alpha_i + \beta_i \Delta \log GlobalRisk_t + \epsilon_{i,t}$$

against a number of variables. Panel (a) reports the point estimates and two standard error bands. Panel (b) plots the point estimates of $\beta_i$ on the x-axis and the $R^2$ of the regression on the y-axis . The dashed vertical line denotes $\beta_i = 0$. If a marker is in gray, it indicates that on average over the sample period, the exchange rate was less flexible than a "managed float" in the Ilzetzki et al. (2019) classification. Panel (c) plots the $\beta_i$ against the average 5-year government nominal interest rates from Du et al. (2018). Panel (d) plots the $\beta_i$ against the average excess return against the USD from Hassan and Zhang (2020).

## Appendix

Appendix Table 1: Number of firms linked to countries

| Country | HQ | Sales | Country | HQ | Sales |
|---|---|---|---|---|---|
| United States | 6,457 | 1,319 | New Zealand | 51 | 85 |
| Canada | 885 | 886 | Taiwan | 49 | 179 |
| United Kingdom | 528 | 990 | South Korea | 45 | 233 |
| Australia | 401 | 385 | Belgium | 41 | 120 |
| China | 325 | 738 | Greece | 40 | 27 |
| India | 299 | 193 | Chile | 31 | 88 |
| Japan | 227 | 595 | Poland | 30 | 86 |
| Germany | 214 | 698 | Turkey | 27 | 61 |
| Sweden | 178 | 118 | Thailand | 23 | 74 |
| Brazil | 168 | 272 | Malaysia | 21 | 112 |
| France | 158 | 405 | Argentina | 20 | 94 |
| Switzerland | 120 | 145 | Indonesia | 18 | 66 |
| Hong Kong | 112 | 113 | Philippines | 18 | 61 |
| Israel | 108 | 74 | Colombia | 16 | 67 |
| Italy | 105 | 247 | Nigeria | 14 | 29 |
| Netherlands | 102 | 207 | Egypt | 8 | 28 |
| Mexico | 96 | 308 | Czech Republic | 6 | 57 |
| South Africa | 94 | 96 | Hungary | 4 | 40 |
| Norway | 89 | 102 | Pakistan | 3 | 8 |
| Ireland | 73 | 90 | Saudi Arabia | 2 | 31 |
| Spain | 73 | 199 | Venezuela | 2 | 36 |
| Russia | 53 | 101 | Iran | 0 | 0 |
| Singapore | 52 | 208 | | | |

*Notes*: This table shows for the 45 countries for which we have text-based measures of country exposure, risk and sentiment and the number of firms that are headquartered in the country (column 1) or report part of their sales to the country (column 2). The headquarter of a firm is from Compustat and based on the `loc` variable and sales are from the Worldscope segment data.

Appendix Table 2: Top 100 risk synonyms

| Synonym | Frequency | Synonym | Frequency |
|---|---|---|---|
| risk | 3,839,353 | skepticism | 8,674 |
| risks | 1,033,976 | unresolved | 8,461 |
| uncertainty | 921,751 | jeopardy | 6,761 |
| variable | 816,649 | risking | 6,414 |
| uncertainties | 549,476 | suspicion | 6,359 |
| possibility | 484,545 | hesitating | 4,354 |
| pending | 426,103 | halting | 4,334 |
| uncertain | 382,217 | peril | 4,259 |
| chance | 360,536 | risked | 4,126 |
| doubt | 285,218 | unreliable | 3,971 |
| prospect | 211,168 | insecurity | 3,105 |
| exposed | 176,667 | undetermined | 3,092 |
| variability | 175,526 | apprehension | 2,881 |
| likelihood | 159,348 | undecided | 2,715 |
| threat | 133,385 | wager | 2,678 |
| probability | 132,931 | precarious | 2,577 |
| bet | 110,781 | torn | 2,563 |
| varying | 85,282 | unsafe | 2,470 |
| unknown | 83,956 | unforeseeable | 2,305 |
| unclear | 75,460 | debatable | 2,178 |
| doubtful | 74,169 | wavering | 1,798 |
| unpredictable | 67,065 | riskiest | 1,788 |
| speculative | 58,116 | dicey | 1,764 |
| fear | 51,378 | endanger | 1,547 |
| hesitant | 47,043 | faltering | 1,530 |
| reservation | 47,003 | changeable | 1,527 |
| risky | 44,332 | indecision | 1,505 |
| sticky | 39,321 | hazy | 1,476 |
| instability | 36,955 | iffy | 1,269 |
| tricky | 33,849 | ambivalent | 1,255 |
| dangerous | 26,551 | riskiness | 1,248 |
| tentative | 26,126 | insecure | 1,189 |
| fluctuating | 26,070 | oscillating | 1,075 |
| gamble | 22,149 | quandary | 1,022 |
| hazardous | 21,836 | dubious | 957 |
| hazard | 21,580 | hairy | 884 |
| queries | 20,899 | treacherous | 753 |
| danger | 18,695 | unreliability | 626 |
| unstable | 18,396 | perilous | 565 |
| erratic | 14,325 | tentativeness | 479 |
| vague | 14,030 | chancy | 461 |
| unpredictability | 13,853 | wariness | 439 |
| query | 13,559 | vagueness | 375 |
| unsettled | 12,563 | dodgy | 318 |
| jeopardize | 12,528 | indecisive | 262 |
| riskier | 11,650 | menace | 239 |
| irregular | 10,161 | equivocation | 224 |
| dilemma | 9,660 | vacillating | 198 |
| hesitancy | 9,342 | imperil | 191 |
| unsure | 8,715 | vacillation | 159 |

*Notes*: This table lists the top 100 synonyms of risk, risky, uncertain, and uncertainty sorted by their frequency in the earnings call transcripts in 2002-2019. The synonyms are taken from the Oxford Dictionary.

Appendix Table 3: Top 100 positive and negative sentiment words

| Positive | Frequency | Positive | Frequency | Negative | Frequency | Negative | Frequency |
|---|---|---|---|---|---|---|---|
| strong | 17,221,419 | enable | 886,239 | loss | 6,235,657 | discontinued | 487,232 |
| good | 16,375,745 | encouraged | 884,693 | decline | 6,154,079 | unfavorable | 479,038 |
| better | 7,991,201 | achieving | 796,439 | negative | 3,647,119 | unfortunately | 453,610 |
| positive | 7,751,315 | strengthen | 784,057 | restructuring | 2,684,909 | volatile | 453,414 |
| opportunities | 7,192,361 | tremendous | 779,182 | against | 2,659,956 | nonperforming | 437,280 |
| able | 6,702,060 | exciting | 744,928 | difficult | 2,659,392 | adverse | 429,524 |
| improvement | 6,673,141 | strengthening | 715,638 | losses | 2,556,652 | closure | 411,024 |
| great | 6,563,803 | enhanced | 708,264 | declined | 2,545,940 | recession | 395,192 |
| improved | 5,348,573 | innovative | 699,642 | closed | 1,726,966 | disclose | 378,916 |
| progress | 5,029,603 | encouraging | 688,923 | late | 1,709,514 | slowing | 378,514 |
| opportunity | 4,914,614 | gaining | 575,582 | challenging | 1,584,998 | missed | 370,918 |
| benefit | 4,543,771 | easy | 570,340 | challenges | 1,574,903 | slowed | 368,101 |
| improve | 4,378,622 | stability | 541,004 | closing | 1,507,678 | lag | 357,819 |
| pleased | 3,884,671 | exceptional | 528,189 | force | 1,318,218 | termination | 352,703 |
| profitability | 3,607,335 | strongest | 511,179 | critical | 1,170,235 | bridge | 351,936 |
| best | 3,544,899 | collaboration | 504,330 | volatility | 1,158,349 | disruption | 343,899 |
| despite | 2,824,225 | positively | 480,821 | declines | 1,061,590 | worse | 340,022 |
| improving | 2,764,809 | impressive | 455,572 | weak | 1,052,269 | lose | 333,493 |
| effective | 2,744,475 | easier | 453,072 | impairment | 1,034,395 | severe | 332,344 |
| strength | 2,675,074 | enabled | 440,147 | slow | 1,010,332 | stress | 325,392 |
| success | 2,638,992 | excellence | 431,839 | recall | 947,283 | downward | 322,255 |
| gain | 2,598,697 | progressing | 430,567 | concerned | 946,866 | deterioration | 317,373 |
| gains | 2,569,678 | strengthened | 422,980 | bad | 907,228 | chargeoffs | 298,441 |
| greater | 2,481,712 | benefiting | 412,070 | claims | 900,164 | doubt | 285,218 |
| stable | 2,436,356 | superior | 409,739 | break | 873,699 | unemployment | 283,048 |
| improvements | 2,424,249 | gained | 409,422 | lost | 821,492 | shut | 282,167 |
| successful | 2,410,367 | winning | 394,088 | weakness | 806,320 | drag | 281,006 |
| achieved | 2,372,811 | exclusive | 388,657 | negatively | 803,988 | losing | 280,300 |
| achieve | 2,357,358 | enhancing | 376,798 | problem | 786,382 | wrong | 274,826 |
| confident | 2,328,839 | advantages | 373,082 | challenge | 773,386 | closures | 265,476 |
| efficiency | 2,208,954 | perfect | 357,260 | weaker | 764,882 | opportunistic | 254,129 |
| favorable | 2,026,078 | efficiently | 351,828 | slowdown | 738,435 | difficulties | 249,851 |
| stronger | 2,016,286 | stabilized | 351,444 | difficulty | 738,121 | slowly | 248,400 |
| leading | 1,984,440 | enables | 350,678 | slower | 735,585 | impairments | 247,091 |
| advantage | 1,842,244 | satisfaction | 350,091 | cut | 734,201 | challenged | 238,877 |
| profitable | 1,702,117 | valuable | 349,853 | declining | 730,136 | poor | 235,879 |
| attractive | 1,556,455 | enabling | 336,446 | litigation | 685,502 | absence | 235,696 |
| innovation | 1,391,174 | alliance | 316,024 | crisis | 680,481 | serious | 230,349 |
| leadership | 1,387,836 | stabilize | 313,098 | problems | 616,975 | shutdown | 225,476 |
| excited | 1,374,945 | rebound | 307,477 | delay | 570,659 | complicated | 224,854 |
| excellent | 1,299,652 | easily | 287,979 | downturn | 563,302 | bankruptcy | 220,373 |
| happy | 1,258,276 | favorably | 280,433 | opposed | 563,195 | divestiture | 215,695 |
| optimistic | 1,215,776 | enjoy | 278,973 | delays | 562,781 | attrition | 215,068 |
| highest | 1,128,349 | boost | 268,376 | dropped | 549,988 | shortfall | 214,061 |
| efficiencies | 1,087,947 | satisfied | 266,476 | disclosed | 535,594 | weakening | 213,005 |
| efficient | 1,086,825 | enhancements | 264,166 | concern | 522,931 | disappointing | 211,210 |
| enhance | 1,078,709 | achievement | 261,148 | lack | 515,471 | erosion | 210,240 |
| successfully | 1,048,883 | improves | 259,611 | breakdown | 510,491 | caution | 208,764 |
| benefited | 928,965 | accomplished | 258,083 | delayed | 508,852 | broken | 206,668 |
| win | 904,122 | strengths | 252,403 | concerns | 489,061 | writeoff | 203,273 |

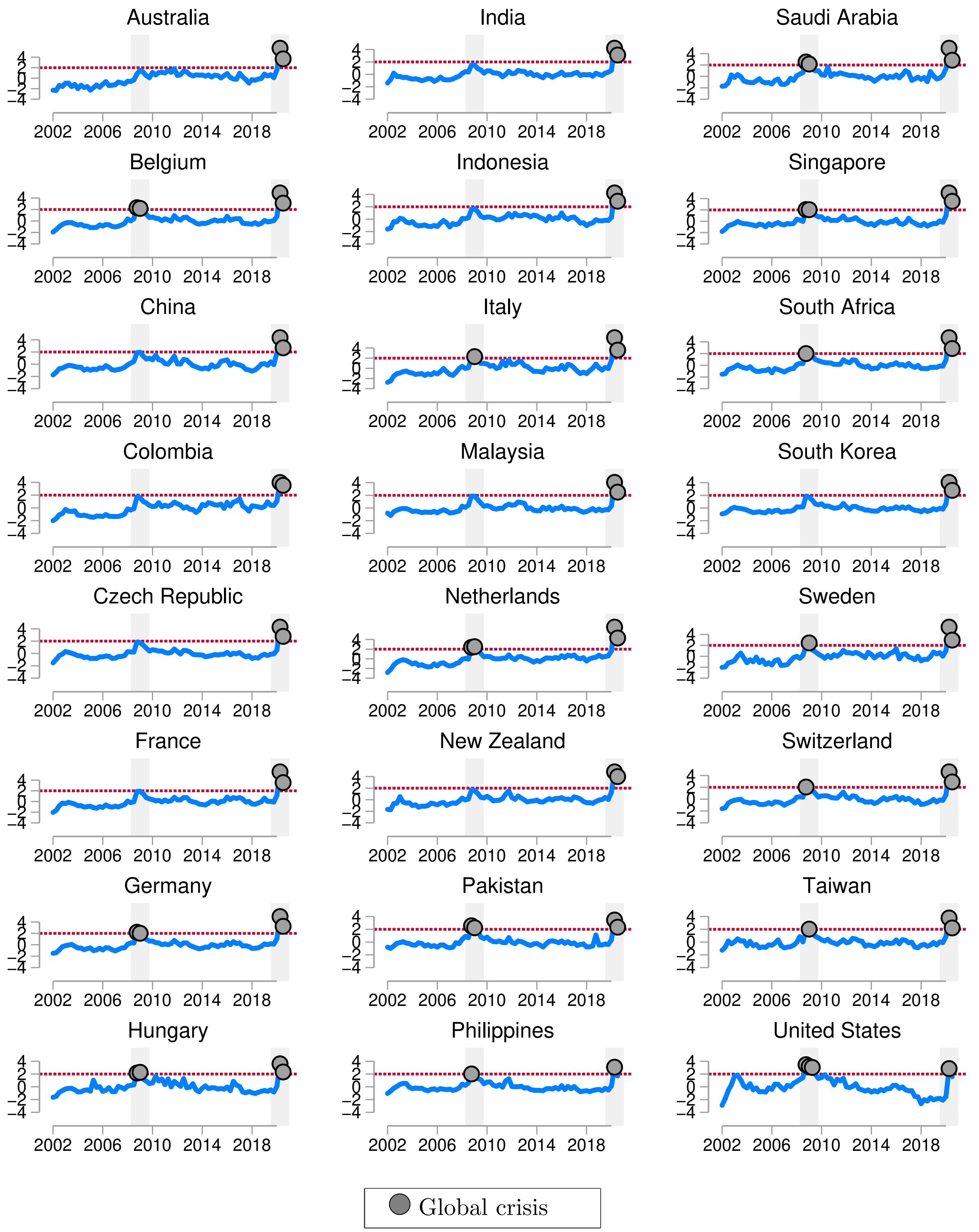
*Notes*: This table lists the top 100 positive (columns 1-4) and negative (columns 5-8) tone words sorted by their frequency in the earnings call transcripts in 2002-2019. The tone words are from Loughran and McDonald (2011).

## Appendix Table 4: Top 15 exposed firms for Greece, Turkey, and Japan

| Company | $CountryExposure_{i,c}$ *(std.)* | $\max_c(CountryExposure_{i,c}$ *(std.)*$)$ | HQ |
|---|---|---|---|
| PANEL A: GREECE | | | |
| European Reliance General Insurance Co SA | 76.224 | 76.224 (Greece) | Greece |
| Cyprus Popular Bank PCL | 61.610 | 61.610 (Greece) | Cyprus |
| Marfin Investment Group Holdings SA | 48.347 | 48.347 (Greece) | Greece |
| Aegean Airlines SA | 46.966 | 46.966 (Greece) | Greece |
| Fourlis SA | 43.794 | 43.794 (Greece) | Greece |
| Eurobank Ergasias SA | 41.201 | 41.201 (Greece) | Greece |
| Piraeus Bank SA | 38.109 | 38.109 (Greece) | Greece |
| Alpha Bank SA | 36.082 | 36.082 (Greece) | Greece |
| Hellenic Telecommunications Organization SA | 35.035 | 35.035 (Greece) | Greece |
| Mytilineos Holdings SA | 34.828 | 34.828 (Greece) | United States |
| Titan Cement Company SA | 34.740 | 34.740 (Greece) | Greece |
| Cosmote Mobile Telecommunications SA | 33.273 | 33.273 (Greece) | Greece |
| Titan Cement Company SA | 32.912 | 32.912 (Greece) | Greece |
| Folli Follie Commercial Manufacturing and Technical SA | 31.442 | 31.442 (Greece) | Greece |
| National Bank of Greece SA | 28.417 | 28.417 (Greece) | Greece |
| PANEL B: TURKEY | | | |
| Turk Hava Yollari AO | 68.729 | 68.729 (Turkey) | Turkey |
| DP Eurasia NV | 62.234 | 62.234 (Turkey) | Netherlands |
| Arcelik AS | 61.638 | 61.638 (Turkey) | Turkey |
| Turkiye Vakiflar Bankasi TAO | 50.785 | 50.785 (Turkey) | Turkey |
| Coca-Cola Icecek AS | 48.545 | 48.545 (Turkey) | Turkey |
| Turkiye Is Bankasi AS | 44.281 | 44.281 (Turkey) | Turkey |
| Eregli Demir ve Celik Fabrikalari TAS | 44.023 | 44.023 (Turkey) | Turkey |
| Ulker Biskuvi Sanayi AS | 42.764 | 42.764 (Turkey) | Turkey |
| Tofas Turk Otomobil Fabrikasi AS | 42.581 | 42.581 (Turkey) | Turkey |
| Turkiye Garanti Bankasi AS | 37.868 | 37.868 (Turkey) | Turkey |
| Akbank TAS | 36.484 | 36.484 (Turkey) | Turkey |
| Turkiye Sise ve Cam Fabrikalari AS | 36.445 | 36.445 (Turkey) | Turkey |
| Koc Holding AS | 35.559 | 35.559 (Turkey) | Turkey |
| BIM Birlesik Magazalar AS | 33.459 | 33.459 (Turkey) | Turkey |
| Turkcell Iletisim Hizmetleri AS | 32.420 | 32.420 (Turkey) | Turkey |
| PANEL C: JAPAN | | | |
| Nintendo Co Ltd | 12.495 | 12.495 (Japan) | Japan |
| MCUBS MidCity Investment Corp | 11.734 | 11.734 (Japan) | Japan |
| SanBio Co Ltd | 11.599 | 11.599 (Japan) | Japan |
| Nippon Prologis REIT Inc | 11.071 | 11.071 (Japan) | Japan |
| Sawai Pharmaceutical Co Ltd | 9.881 | 9.881 (Japan) | Japan |
| Macromill Inc | 9.484 | 9.484 (Japan) | Japan |
| Hikari Tsushin Inc | 9.220 | 9.220 (Japan) | Japan |
| Recruit Holdings Co Ltd | 8.939 | 8.939 (Japan) | Japan |
| Monex Group Inc | 8.908 | 8.908 (Japan) | Japan |
| Sky Solar Holdings Ltd | 8.626 | 12.450 (Uruguay) | Hong Kong |
| Opto Circuits (India) Ltd | 8.575 | 8.575 (Japan) | India |
| CMIC Holdings Co Ltd | 8.401 | 8.401 (Japan) | Japan |
| Caladrius Biosciences Inc | 8.320 | 8.320 (Japan) | United States |
| Terumo Corp | 8.309 | 8.309 (Japan) | Japan |
| Volcano Corp | 7.843 | 7.843 (Japan) | United States |

*Notes*: This table lists the top 15 firms when sorted on $CountryExposure_{i,c}$ for Greece (Panel A), Turkey (Panel B), and Japan (Panel C). Column 3 shows the country that the firm is most exposed to: $\max_c(CountryExposure_{i,c}$ *(std.)*$)$, and column 4 the firm's country of headquarter.

Appendix Table 5: Countries with no local crises




*Notes*: This table shows the time series of $CountryRisk_{c,t}$ for all countries that do not have local crises as defined in Table 11.

# Appendix Table 6: Alternative definitions of $TransmissionRisk_{i,t}$

| PANEL A | log(*investment rate*$_{i,t}$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $TransmissionRisk^{NHQ}_{i,t}$ *(std.)* | –0.065*** | –0.064*** | | | | | | |
| | (0.008) | (0.008) | | | | | | |
| $\sum_{c\neq c(i)} \overline{CountryExposure}_{i,c,t_{i,c}} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)* | | | –0.296*** | –0.285** | | | | |
| | | | (0.113) | (0.114) | | | | |
| $\sum_{c\neq c(i)} Share\overline{CountryExposure}_{i,c,t_{i,c}} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)* | | | | | –0.213*** | –0.206*** | | |
| | | | | | (0.072) | (0.072) | | |
| $\sum_{c\neq c(i)} CountryRisk_{i,c,t}$ *(std.)* | | | | | | | –0.048*** | –0.045*** |
| | | | | | | | (0.007) | (0.010) |
| $FirmRisk_{i,t}$ *(std.)* | | –0.038*** | | –0.039*** | | –0.039*** | | –0.005 |
| | | (0.007) | | (0.007) | | (0.007) | | (0.010) |
| $R^2$ | 0.525 | 0.526 | 0.524 | 0.525 | 0.524 | 0.525 | 0.525 | 0.525 |
| $N$ | 73,741 | 73,741 | 73,741 | 73,741 | 73,741 | 73,741 | 73,741 | 73,741 |
| PANEL B | $\Delta$ log(*employment*$_{i,t}$) | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $TransmissionRisk^{NHQ}_{i,t}$ *(std.)* | –0.009*** | –0.008*** | | | | | | |
| | (0.002) | (0.002) | | | | | | |
| $\sum_{c\neq c(i)} \overline{CountryExposure}_{i,c,t_{i,c}} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)* | | | –0.078*** | –0.077*** | | | | |
| | | | (0.029) | (0.029) | | | | |
| $\sum_{c\neq c(i)} Share\overline{CountryExposure}_{i,c,t_{i,c}} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)* | | | | | –0.054*** | –0.053*** | | |
| | | | | | (0.017) | (0.017) | | |
| $\sum_{c\neq c(i)} CountryRisk_{i,c,t}$ *(std.)* | | | | | | | –0.007*** | –0.001 |
| | | | | | | | (0.001) | (0.002) |
| $FirmRisk_{i,t}$ *(std.)* | | –0.008*** | | –0.009*** | | –0.009*** | | –0.008*** |
| | | (0.001) | | (0.001) | | (0.001) | | (0.002) |
| $R^2$ | 0.244 | 0.244 | 0.243 | 0.244 | 0.243 | 0.244 | 0.244 | 0.244 |
| $N$ | 69,484 | 69,484 | 69,484 | 69,484 | 69,484 | 69,484 | 69,484 | 69,484 |
| PANEL C | log(1 + *end-of-year 52wk price*$_{i,t}$(%)) | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $TransmissionRisk^{NHQ}_{i,t}$ *(std.)* | –0.014*** | –0.013*** | | | | | | |
| | (0.004) | (0.004) | | | | | | |
| $\sum_{c\neq c(i)} \overline{CountryExposure}_{i,c,t_{i,c}} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)* | | | –0.168*** | –0.164*** | | | | |
| | | | (0.060) | (0.060) | | | | |
| $\sum_{c\neq c(i)} Share\overline{CountryExposure}_{i,c,t_{i,c}} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)* | | | | | –0.128*** | –0.126*** | | |
| | | | | | (0.039) | (0.039) | | |
| $\sum_{c\neq c(i)} CountryRisk_{i,c,t}$ *(std.)* | | | | | | | –0.008*** | 0.001 |
| | | | | | | | (0.003) | (0.005) |
| $FirmRisk_{i,t}$ *(std.)* | | –0.012*** | | –0.012*** | | –0.012*** | | –0.013*** |
| | | (0.003) | | (0.003) | | (0.003) | | (0.005) |
| $R^2$ | 0.404 | 0.404 | 0.404 | 0.404 | 0.404 | 0.404 | 0.404 | 0.404 |
| $N$ | 88,166 | 88,166 | 88,166 | 88,166 | 88,166 | 88,166 | 88,166 | 88,166 |
| Firm FE | yes | yes | yes | yes | yes | yes | yes | yes |
| Country×Year FE | yes | yes | yes | yes | yes | yes | yes | yes |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the firm-year level. $\sum_{c\neq c(i)} \overline{CountryExposure}_{i,c,t_{i,c}} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)* is defined similarly as $TransmissionRisk_{i,t} := \sum_{c\neq c(i)} CountryExposure_{i,c,t} \times \widetilde{CountryRisk}_{c,t}$ but with $\overline{CountryExposure}_{i,c,t_{i,c}}$ replacing $CountryExposure_{i,c,t}$, where $\overline{CountryExposure}_{i,c,t_{i,c}}$ is the average over time of firm $i$'s exposure to country $c$. Similarly, in $\sum_{c\neq c(i)} Share\overline{CountryExposure}_{i,c,t_{i,c}} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)*, $Share\overline{CountryExposure}_{i,c,t_{i,c}}$ replaces $CountryExposure_{i,c,t}$, where $Share\overline{CountryExposure}_{i,c,t_{i,c}}$ is the share in country $c$'s total exposure of firm $i$'s exposure to country $c$. Finally, $\sum_{c\neq c(i)} CountryRisk^{NHQ}_{i,c,t}$ is the sum over all countries (except the country of headquarter) of firm $i$'s $CountryRisk_{i,c,t}$. All remaining variables are defined as in Table 2. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Appendix Table 7: Horse race of $Exposure_{i,c,t}$ against alternative measures of firm-country links in $TransmissionRisk_{i,t}$

| | All firms | | | US firms | | |
|---|---|---|---|---|---|---|
| | log(*investment rate*$_{i,t}$) | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $TransmissionRisk^{NHQ}_{i,t}$ *(std)* | –0.065*** | –0.065*** | –0.065*** | –0.118*** | –0.118*** | –0.118*** |
| | (0.008) | (0.008) | (0.008) | (0.013) | (0.013) | (0.013) |
| $\sum_{c\neq c(i)} \mathbb{1}(SegmentSale_{i,c}) \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std)* | | –0.090 | | | 0.193 | |
| | | (0.157) | | | (0.228) | |
| $\sum_{c\neq c(i)} SegmentSale_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std)* | | | –0.051 | | | –0.163 |
| | | | (0.037) | | | (0.215) |
| $R^2$ | 0.525 | 0.525 | 0.525 | 0.499 | 0.499 | 0.499 |
| $N$ | 73,741 | 73,741 | 73,741 | 47,175 | 47,175 | 47,175 |
| | $\Delta$ log(*employment*$_{i,t}$) | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $TransmissionRisk^{NHQ}_{i,t}$ *(std)* | –0.009*** | –0.009*** | –0.009*** | –0.020*** | –0.020*** | –0.020*** |
| | (0.002) | (0.002) | (0.002) | (0.003) | (0.003) | (0.003) |
| $\sum_{c\neq c(i)} \mathbb{1}(SegmentSale_{i,c}) \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std)* | | 0.002 | | | 0.041 | |
| | | (0.034) | | | (0.046) | |
| $\sum_{c\neq c(i)} SegmentSale_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std)* | | | –0.012 | | | 0.003 |
| | | | (0.008) | | | (0.026) |
| $R^2$ | 0.244 | 0.244 | 0.244 | 0.236 | 0.236 | 0.236 |
| $N$ | 69,484 | 69,484 | 69,484 | 45,766 | 45,766 | 45,766 |
| | log(1 + *end-of-year 52wk price*$_{i,t}$(%)) | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $TransmissionRisk^{NHQ}_{i,t}$ *(std)* | –0.014*** | –0.014*** | –0.014*** | –0.028*** | –0.028*** | –0.028*** |
| | (0.004) | (0.004) | (0.004) | (0.008) | (0.008) | (0.008) |
| $\sum_{c\neq c(i)} \mathbb{1}(SegmentSale_{i,c}) \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std)* | | –0.147** | | | –0.048 | |
| | | (0.072) | | | (0.117) | |
| $\sum_{c\neq c(i)} SegmentSale_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std)* | | | –0.010 | | | –0.021 |
| | | | (0.015) | | | (0.085) |
| $R^2$ | 0.404 | 0.404 | 0.404 | 0.377 | 0.377 | 0.377 |
| $N$ | 88,166 | 88,166 | 88,166 | 53,832 | 53,832 | 53,832 |
| Year FE | n/a | n/a | n/a | yes | yes | yes |
| Firm FE | yes | yes | yes | yes | yes | yes |
| Country×Year FE | yes | yes | yes | n/a | n/a | n/a |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the firm-year level. $\sum_{c\neq c(i)} \mathbb{1}(SegmentSale_{i,c}) \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)* is defined similarly as $TransmissionRisk_{i,t} := \sum_{c\neq c(i)} CountryExposure_{i,c,t} \times \widetilde{CountryRisk}_{c,t}$ but with $\mathbb{1}(SegmentSale_{i,c})$ replacing $CountryExposure_{i,c,t}$, where $\mathbb{1}(SegmentSale_{i,c})$ is a dummy equal to one if firm $i$ reported a sale to country $c$ anytime between 2002-2019. $\sum_{c\neq c(i)} \mathbb{1}(SegmentSale_{i,c}) \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ *(std.)* is defined analogously but instead of a dummy it uses the average sales (in USD) of firm $i$ to country $c$. The remaining variables are defined as in Table 2. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Appendix Table 8: $TransmissionRisk_{c(i),c}$ follows a gravity structure

| | $\log(TransmissionRisk_{c(i),c})$ | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Log of distance (km)$_{c(i),c}$ | | –0.163*** | –0.125*** |
| | | (0.010) | (0.011) |
| $\mathbb{1}$(Contiguity$_{c(i),c}$) | | 0.215*** | 0.156*** |
| | | (0.058) | (0.052) |
| $\mathbb{1}$(Common language$_{c(i),c}$) | | 0.184*** | 0.177*** |
| | | (0.025) | (0.026) |
| $\mathbb{1}$(Ever in colonial relationship$_{c(i),c}$) | | 0.061* | 0.060 |
| | | (0.032) | (0.037) |
| $\mathbb{1}$(Log of trade flows in 2019$_{c(i),c}$) | | | 0.037*** |
| | | | (0.005) |
| $R^2$ | 0.980 | 0.986 | 0.986 |
| $N$ | 3,466 | 3,417 | 2,316 |
| Source×destination FE | yes | yes | yes |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the country-country level. Similar to Table 12, $TransmissionRisk_{c(i),c}$ is defined as the sum over the relevant components of $TransmissionRisk_{i,t} := \sum_{c \neq c(i)} CountryExposure_{i,c,t} \times \widetilde{CountryRisk}_{c,t}$ for country-country pairs. For example, for country-country pair $(c(i), c)$, we take the sum over all firms headquartered in country $c(i)$ of the relevant components about country $c$: $\sum_{i \in c(i), c=c} CountryExposure_{i,c,t} \times \widetilde{CountryRisk}_{c,t}$. Standard errors are robust. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Appendix Table 9: Stylized Facts about Risk and Sentiment

| PANEL A | *CountryRisk*$_{c,t}$ *(std.)* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| First PC of *CountryRisk*$_{c,t}$ *(std.)* | 0.153*** | | |
| | (0.003) | | |
| *CountryRisk*$_{c,t-1}$ *(std.)* | | 0.922*** | |
| | | (0.011) | |
| *Real GDP growth*$_{c,t}$ | | | –0.011*** |
| | | | (0.003) |
| $R^2$ | 0.515 | 0.856 | 0.004 |
| $N$ | 3,240 | 3,195 | 2,882 |

| PANEL B | *CountrySentiment*$_{c,t}$ *(std.)* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| First PC of *CountrySentiment*$_{c,t}$ *(std.)* | 0.149*** | | |
| | (0.001) | | |
| *CountrySentiment*$_{c,t-1}$ *(std.)* | | 0.933*** | |
| | | (0.009) | |
| *Real GDP growth*$_{c,t}$ | | | 0.003 |
| | | | (0.003) |
| $R^2$ | 0.845 | 0.874 | 0.000 |
| $N$ | 3,240 | 3,195 | 2,882 |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the country-quarter level. The first PC of *CountryRisk*$_{c,t}$ is defined as the first principal component of *CountryRisk*$_{c,t}$; the first PC of *CountryRisk*$_{c,t}$ is defined similarly. All other variables are defined as in Table 2. Standard errors are robust. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Appendix Table 10: Capital flows to the US when Risk Increases

| | $(Inflows_{c,t}/stock_{c,t-1})$*100 | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| $CountryRisk_{c,t}$ *(std.)* | –1.068*** | –1.141*** | –1.122*** |
| | (0.264) | (0.272) | (0.311) |
| $USA_c \times CountryRisk_{c=USA,t}$ *(std.)* | | 1.353*** | 1.033*** |
| | | (0.278) | (0.385) |
| $GlobalRisk_t$ *(std.)* | –0.082 | –0.069 | |
| | (0.123) | (0.124) | |
| *Real GDP* $growth_{c,t}$ | –0.003 | –0.003 | |
| | (0.013) | (0.013) | |
| $R^2$ | 0.096 | 0.098 | 0.132 |
| $N$ | 2,796 | 2,796 | 2,936 |
| Country FE | yes | yes | yes |
| Year-quarter FE | no | no | yes |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the country-quarter level. $USA_c$ is a dummy equal to one if the country is the United States, and zero otherwise. All other variables are defined as in Table 2. Standard errors are robust. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Appendix Table 11: Country Crises

| Panel A | log(*investment rate*$_{i,t}$) | |
|---|---|---|
| | (1) | (2) |
| $TransmissionRisk^{NHQ}_{i,t}$ (std) | –0.065*** | |
| | (0.008) | |
| $CrisisTransmission^{NHQ}_{i,t}$ (std) | | –0.020*** |
| | | (0.006) |
| $R^2$ | 0.525 | 0.524 |
| $N$ | 73,741 | 73,741 |
| **Panel B** | $\Delta$ log(*employment*$_{i,t}$) | |
| | (1) | (2) |
| $TransmissionRisk^{NHQ}_{i,t}$ (std) | –0.009*** | |
| | (0.002) | |
| $CrisisTransmission^{NHQ}_{i,t}$ (std) | | –0.006*** |
| | | (0.002) |
| $R^2$ | 0.244 | 0.243 |
| $N$ | 69,484 | 69,484 |
| **Panel C** | log(1 + *end-of-year 52wk return*(%))$_{i,t}$ | |
| | (1) | (2) |
| $TransmissionRisk^{NHQ}_{i,t}$ (std) | –0.014*** | |
| | (0.004) | |
| $CrisisTransmission^{NHQ}_{i,t}$ (std) | | –0.022*** |
| | | (0.003) |
| $R^2$ | 0.404 | 0.404 |
| $N$ | 88,166 | 88,166 |
| Firm FE | yes | yes |
| Year×Country FE | yes | yes |

*Notes*: This table shows coefficient estimates and standard errors from regressions at the firm-year level. All variables are defined as in Table 2. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Appendix Table 12: Global Risk and Local Risk: EW-Broad

| | $\Delta log\left(\widetilde{Risk_{C,t}}\right)$ | $R^2$ | $\Delta log\left(GlobalRisk_t\right)$ | $R^2$ | $\Delta log\left(\widetilde{Risk_{C,t}}\right)$ | $\Delta log\left(GlobalRisk_t\right)$ | $R^2$ |
|---|---|---|---|---|---|---|---|
| AUD | 0.179 | 0.048 | -0.216 | 0.106 | -0.211 | 0.171 | 0.149 |
| BRL | -0.126 | 0.045 | -0.347*** | 0.175 | -0.357*** | -0.139 | 0.230 |
| CAD | 0.0327 | 0.032 | -0.0164 | 0.004 | -0.0292 | 0.0374 | 0.043 |
| CHF | 0.134 | 0.009 | 0.206** | 0.175 | 0.203* | 0.0780 | 0.178 |
| CLP | -0.0932 | 0.034 | -0.0599 | 0.018 | -0.102* | -0.135 | 0.079 |
| CNY | -0.00171 | 0.000 | 0.258* | 0.217 | 0.281** | 0.108 | 0.236 |
| COP | 0.233** | 0.081 | -0.247*** | 0.171 | -0.215** | 0.139 | 0.197 |
| EUR | 0.0861 | 0.005 | 0.135*** | 0.132 | 0.134*** | 0.0700 | 0.135 |
| GBP | -0.195 | 0.058 | -0.0138 | 0.001 | 0.00243 | -0.196 | 0.058 |
| HUF | -0.0529 | 0.008 | -0.0825 | 0.021 | -0.0860 | -0.0584 | 0.031 |
| IDR | 0.0879 | 0.019 | 0.0704* | 0.038 | 0.0794** | 0.109 | 0.067 |
| ILS | -0.0827 | 0.030 | 0.156*** | 0.157 | 0.174*** | -0.120*** | 0.219 |
| INR | -0.0483 | 0.005 | 0.0712 | 0.032 | 0.0736 | 0.00943 | 0.032 |
| JPY | -0.105*** | 0.029 | 0.549* | 0.288 | 0.538* | -0.0779** | 0.304 |
| KRW | 0.0559 | 0.001 | -0.0486 | 0.010 | -0.0535 | -0.0330 | 0.010 |
| MXN | -0.0719 | 0.033 | -0.321*** | 0.335 | -0.330*** | -0.0884* | 0.384 |
| MYR | -0.0967 | 0.013 | 0.167** | 0.161 | 0.167** | -0.00388 | 0.161 |
| NOK | 0.0333 | 0.024 | -0.203*** | 0.257 | -0.199*** | 0.00938 | 0.259 |
| NZD | 0.159 | 0.023 | -0.156 | 0.093 | -0.146 | 0.102 | 0.102 |
| PHP | -0.181 | 0.041 | 0.253*** | 0.289 | 0.266*** | 0.0534 | 0.292 |
| PLN | -0.0227 | 0.003 | -0.102 | 0.026 | -0.113 | -0.0386 | 0.033 |
| RUB | -0.122 | 0.021 | -0.175 | 0.041 | -0.156 | -0.0925 | 0.052 |
| SEK | 0.0279 | 0.004 | 0.0271 | 0.005 | 0.0242 | 0.0241 | 0.007 |
| THB | 0.0160 | 0.005 | 0.217** | 0.212 | 0.218** | -0.00403 | 0.212 |
| TRY | 0.0218 | 0.005 | -0.132** | 0.036 | -0.129** | 0.0177 | 0.039 |
| USD | 0.0802 | 0.014 | 0.275** | 0.232 | 0.272** | 0.0239 | 0.234 |
| ZAR | -0.0770 | 0.002 | -0.396*** | 0.272 | -0.404*** | -0.176 | 0.283 |
| Mean | -.004 | .0219 | -.004 | .1297 | -.003 | -.007 | .1491 |

Notes: This table plots the coefficient $\beta_i$ and $R^2$ for three regressions of the form

$$\Delta e_{i,t}^{B} = \alpha_i + \beta_{i,1}\Delta\log\widetilde{Risk}_{i,t} + \beta_{i,2}\Delta\log GlobalRisk_t + \epsilon_{i,t}$$

The first regression includes only $\Delta\log\widetilde{Risk}_{i,t}$, the second includes only $\Delta\log GlobalRisk_t$ and the third includes both. The row "Mean" is the equal-weighted mean of all the $\beta_i$ and $R_i^2$.

Appendix Table 13: Global Risk and Local Risk: USD

| | $\Delta log\left(\widetilde{Risk_{C,t}}\right)$ | $R^2$ | $\Delta log\left(GlobalRisk_t\right)$ | $R^2$ | $\Delta log\left(\widetilde{Risk_{C,t}}\right)$ | $\Delta log\left(GlobalRisk_t\right)$ | $R^2$ |
|---|---|---|---|---|---|---|---|
| AUD | 0.125 | 0.015 | -0.376 | 0.152 | 0.112 | -0.372 | 0.164 |
| BRL | -0.0794 | 0.008 | -0.689*** | 0.326 | -0.105 | -0.697*** | 0.341 |
| CAD | -0.0183 | 0.002 | -0.264** | 0.159 | 0.00763 | -0.266** | 0.159 |
| CHF | -0.174 | 0.012 | -0.107 | 0.031 | -0.163 | -0.105 | 0.042 |
| CLP | -0.0437 | 0.003 | -0.340* | 0.187 | -0.207* | -0.408** | 0.237 |
| CNY | -0.0243 | 0.004 | -0.0391** | 0.021 | -0.0422 | -0.0474* | 0.033 |
| COP | 0.312** | 0.057 | -0.480*** | 0.254 | 0.105 | -0.454*** | 0.260 |
| EUR | 0.193 | 0.010 | -0.181 | 0.070 | 0.195 | -0.181 | 0.080 |
| GBP | -0.166 | 0.021 | -0.309* | 0.193 | -0.115 | -0.302* | 0.203 |
| HUF | -0.0604 | 0.004 | -0.408** | 0.175 | -0.0843 | -0.414** | 0.184 |
| IDR | 0.0479 | 0.002 | -0.252* | 0.146 | -0.00497 | -0.253** | 0.146 |
| ILS | -0.0609 | 0.011 | -0.155* | 0.084 | -0.0417 | -0.150* | 0.089 |
| INR | 0.160 | 0.031 | -0.245*** | 0.185 | -0.0264 | -0.252*** | 0.186 |
| JPY | -0.0560 | 0.018 | 0.140 | 0.042 | -0.0492 | 0.133 | 0.056 |
| KRW | 0.511*** | 0.050 | -0.354* | 0.222 | -0.0219 | -0.357 | 0.222 |
| MXN | -0.0191 | 0.001 | -0.572*** | 0.441 | -0.0188 | -0.572*** | 0.442 |
| MYR | 0.120 | 0.013 | -0.175*** | 0.112 | 0.0275 | -0.171*** | 0.112 |
| NOK | 0.0808 | 0.033 | -0.354** | 0.176 | 0.0396 | -0.336** | 0.183 |
| NZD | 0.184 | 0.014 | -0.389** | 0.171 | 0.0961 | -0.381* | 0.174 |
| PHP | -0.0279 | 0.001 | -0.0353 | 0.007 | -0.0741 | -0.0536 | 0.014 |
| PLN | 0.0128 | 0.000 | -0.420* | 0.167 | -0.0438 | -0.433** | 0.171 |
| RUB | -0.296 | 0.058 | -0.458*** | 0.128 | -0.217 | -0.413*** | 0.158 |
| SEK | -0.0328 | 0.002 | -0.270 | 0.103 | 0.0137 | -0.272 | 0.103 |
| THB | -0.0180 | 0.010 | -0.122*** | 0.098 | -0.00705 | -0.119*** | 0.100 |
| TRY | 0.0388 | 0.006 | -0.452*** | 0.178 | 0.0236 | -0.448*** | 0.180 |
| ZAR | 0.0326 | 0.000 | -0.634*** | 0.297 | -0.0636 | -0.636*** | 0.298 |
| Mean | .0285 | .0148 | -.305 | .1586 | -.025 | -.306 | .1668 |

Notes: This table plots the coefficient $\beta_i$ and $R^2$ for three regressions of the form

$$\Delta e_{i,t}^{USD} = \alpha_i + \beta_{i,1}\Delta \log \widetilde{Risk}_{i,t} + \beta_{i,2}\Delta \log GlobalRisk_t + \epsilon_{i,t}$$

The first regression includes only $\Delta \log \widetilde{Risk}_{i,t}$, the second includes only $\Delta \log GlobalRisk_t$ and the third includes both. The row "Mean" is the equal-weighted mean of all the $\beta_i$ and $R_i^2$.

Appendix Table 14: Global Sentiment and Local Sentiment: EW-Broad

| | $\Delta log\left(\widetilde{Sent_{C,t}}\right)$ | $R^2$ | $\Delta log\left(GlobalSent_t\right)$ | $R^2$ | $\Delta log\left(\widetilde{Sent_{C,t}}\right)$ | $\Delta log\left(GlobalSent_t\right)$ | $R^2$ |
|---|---|---|---|---|---|---|---|
| AUD | 0.177* | 0.053 | 0.0596 | 0.104 | 0.0557 | 0.152* | 0.143 |
| BRL | 0.229*** | 0.217 | 0.101*** | 0.190 | 0.0678 | 0.169*** | 0.288 |
| CAD | 0.0287* | 0.041 | -0.00216 | 0.001 | -0.0352** | 0.0817** | 0.129 |
| CHF | 0.520*** | 0.138 | -0.0578** | 0.178 | -0.0426 | 0.260 | 0.200 |
| CLP | 0.0695 | 0.021 | -0.00907 | 0.005 | -0.00456 | 0.0648 | 0.022 |
| CNY | -0.141 | 0.018 | -0.0771* | 0.250 | -0.0990*** | -0.393** | 0.372 |
| COP | -0.124 | 0.015 | 0.0623*** | 0.140 | 0.0634*** | -0.142 | 0.159 |
| EUR | 0.378*** | 0.132 | -0.0382*** | 0.136 | -0.0243 | 0.232 | 0.167 |
| GBP | 0.318* | 0.039 | 0.000887 | 0.000 | 0.0172 | 0.418* | 0.051 |
| HUF | 0.150 | 0.041 | 0.0382 | 0.058 | 0.0466 | 0.194 | 0.124 |
| IDR | 0.0764 | 0.009 | 0.00370 | 0.001 | 0.00571 | 0.0847 | 0.013 |
| ILS | -0.0255 | 0.001 | -0.0451*** | 0.169 | -0.0451*** | -0.0206 | 0.170 |
| INR | 0.137 | 0.036 | -0.0218 | 0.039 | -0.0263** | 0.167* | 0.090 |
| JPY | 0.0256*** | 0.015 | -0.149* | 0.273 | -0.150* | 0.0287*** | 0.293 |
| KRW | 0.0347 | 0.001 | 0.00687 | 0.003 | 0.0219 | 0.216 | 0.012 |
| MXN | 0.191* | 0.152 | 0.0724** | 0.220 | 0.0568** | 0.110** | 0.260 |
| MYR | 0.0780 | 0.005 | -0.0533** | 0.211 | -0.0585** | -0.134 | 0.224 |
| NOK | 0.0760** | 0.056 | 0.0501*** | 0.202 | 0.0474*** | 0.0583* | 0.234 |
| NZD | -0.0485 | 0.002 | 0.0562 | 0.157 | 0.0561 | -0.00873 | 0.157 |
| PHP | 0.309*** | 0.132 | -0.0778*** | 0.354 | -0.0739*** | 0.0473 | 0.356 |
| PLN | 0.123 | 0.046 | 0.0564 | 0.101 | 0.0546 | 0.114 | 0.140 |
| RUB | 0.349** | 0.189 | 0.0575* | 0.056 | 0.0372 | 0.324* | 0.211 |
| SEK | 0.0701 | 0.018 | 0.00417 | 0.001 | 0.00296 | 0.0690 | 0.018 |
| THB | 0.00380 | 0.001 | -0.0615** | 0.221 | -0.0616** | 0.00446 | 0.222 |
| TRY | 0.209** | 0.110 | 0.0379** | 0.038 | 0.0409*** | 0.215** | 0.154 |
| USD | -0.167 | 0.026 | -0.0808** | 0.259 | -0.0998** | 0.210 | 0.286 |
| ZAR | -0.131 | 0.002 | 0.110*** | 0.269 | 0.114*** | 0.257 | 0.277 |
| Mean | .1079 | .0561 | .0016 | .1346 | -.001 | .1029 | .1767 |

Notes: This table plots the coefficient $\beta_i$ and $R^2$ for three regressions of the form

$$\Delta e^B_{i,t} = \alpha_i + \beta_{i,1}\Delta \log \widetilde{Sentiment}_{i,t} + \beta_{i,2}\Delta \log GlobalSentiment_t + \epsilon_{i,t}$$

The first regression includes only $\Delta \log \widetilde{Risk}_{i,t}$, the second includes only $\Delta \log GlobalRisk_t$ and the third includes both. The row "Mean" is the equal-weighted mean of all the $\beta_i$ and $R^2_i$.

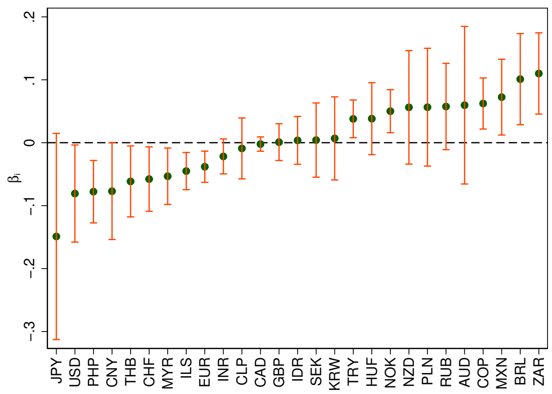
Appendix Table 15: Exchange Rates, Risk, and Sentiment

| | (1) $\Delta e_{i,t}^{USD}$ | (2) $\Delta e_{i,t}^{USD}$ | (3) $\Delta e_{i,t}^{USD}$ | (4) $\Delta e_{i,t}^{USD}$ | (5) $\Delta e_{i,t}^{B}$ | (6) $\Delta e_{i,t}^{B}$ | (7) $\Delta e_{i,t}^{B}$ | (8) $\Delta e_{i,t}^{B}$ |
|---|---|---|---|---|---|---|---|---|
| $\Delta log\left(\widetilde{Risk_{C,t}}\right)$ | -0.017 | -0.022 | | | -0.013 | -0.013 | | |
| | (0.019) | (0.015) | | | (0.016) | (0.016) | | |
| $\Delta log\left(GlobalRisk_t\right)$ | -0.306*** | | | | -0.006 | | | |
| | (0.032) | | | | (0.028) | | | |
| $\Delta log\left(\widetilde{Sent_{C,t}}\right)$ | | | 0.052*** | 0.056*** | | | 0.052*** | 0.053*** |
| | | | (0.020) | (0.015) | | | (0.015) | (0.015) |
| $\Delta log\left(GlobalSent_t\right)$ | | | 0.084*** | | | | 0.001 | |
| | | | (0.009) | | | | (0.007) | |
| Constant | -0.001 | -0.004*** | -0.003** | -0.004*** | -0.001 | -0.001 | -0.001 | -0.001 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Observations | 1,713 | 1,713 | 1,713 | 1,713 | 1,431 | 1,431 | 1,431 | 1,431 |
| R-squared | 0.158 | 0.539 | 0.163 | 0.548 | 0.059 | 0.059 | 0.075 | 0.076 |
| Country FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Quarter FE | No | Yes | No | Yes | No | Yes | No | Yes |

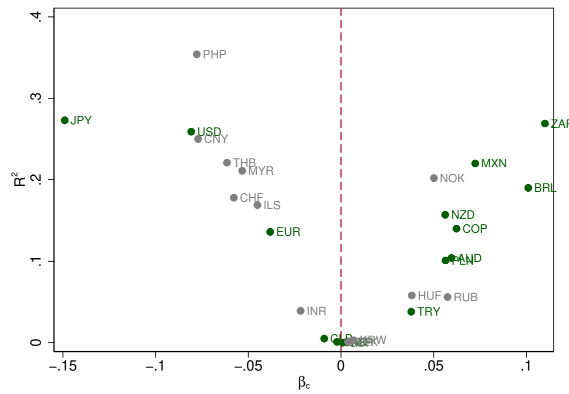
Notes: $\Delta e_{i,t}^{USD}$ denotes the quarterly log change in the exchange rate of country $i$ against the USD, with an increase indicating an appreciation of currency $i$. $\Delta e_{it}^{B}$ is the equal-weighted broad exchange rate of currency $i$.

Appendix Figure 1: Exchange Rates and Global Sentiment: Equal-Weighted Broad Exchange Rate

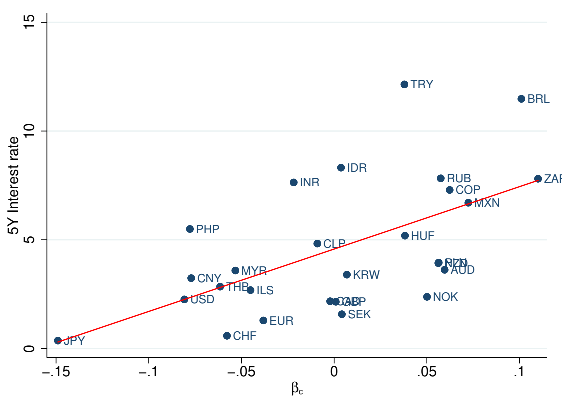
(a) Estimated Beta



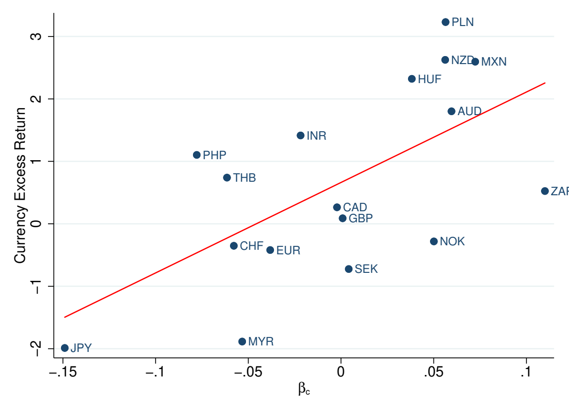

(b) $R^2$ and $\beta$




(c) Equal Weighted




(d) $\beta$ and exccess return against USD



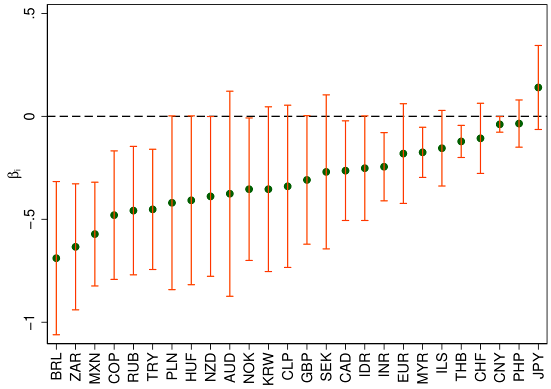

Notes: This figure plots the coefficient $\beta_i$ for regressions of the form

$$\Delta e^B_{i,t} = \alpha_i + \beta_i \Delta \log GlobalSentiment_t + \epsilon_{i,t}$$

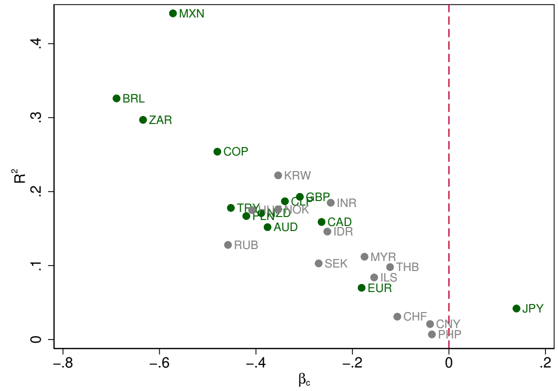
against a number of variables. Panel (a) reports the point estimates and two standard error bands. Panel (b) plots the point estimates of $\beta_i$ on the x-axis and the $R^2$ of the regression on the y-axis . The dashed vertical line denotes $\beta_i = 0$. If a marker is in gray, it indicates that on average over the sample period, the exchange rate was less flexible than a "managed float" in the Ilzetzki et al. (2019) classification. Panel (c) plots the $\beta_i$ against the average 5-year government nominal interest rate from Du et al. (2018). Panel (d) plots the $\beta_i$ against the average excess return against the USD from Hassan and Zhang (2020).

Appendix Figure 2: Exchange Rates and Global Risk: Bilateral against USD

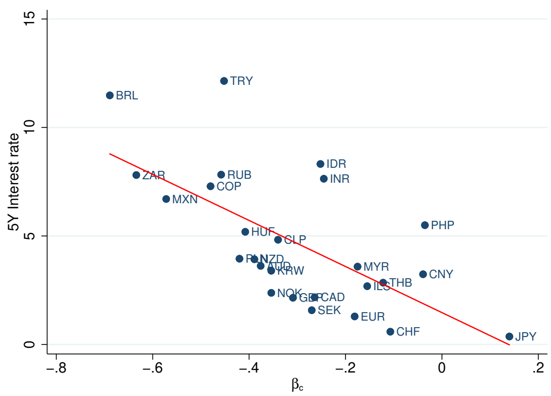
(a) USD



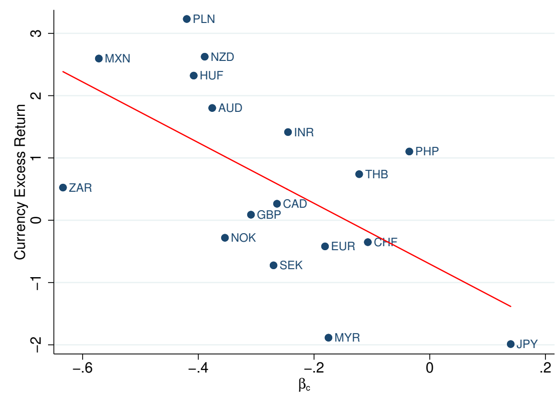

(b) $R^2$ and $\beta$




(c) Equal Weighted




(d) $\beta$ and exccess return against USD




Notes: This figure plots the coefficient $\beta_i$ for regressions of the form

$$\Delta e_{i,t}^{USD} = \alpha_i + \beta_i \Delta \log GlobalSentiment_t + \epsilon_{i,t}$$

against a number of variables. Panel (a) reports the point estimates and two standard error bands. Panel (b) plots the point estimates of $\beta_i$ on the x-axis and the $R^2$ of the regression on the y-axis . The dashed vertical line denotes $\beta_i = 0$. If a marker is in gray, it indicates that on average over the sample period, the exchange rate was less flexible than a "managed float" in the Ilzetzki et al. (2019) classification. Panel (c) plots the $\beta_i$ against the average 5-year government nominal interest rate from Du et al. (2018). Panel (d) plots the $\beta_i$ against the average excess return against the USD from Hassan and Zhang (2020).