Sources and Transmission of Country Risk[*]

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Abstract

We use textual analysis of earnings conference calls held by listed firms around the world to measure the amount of risk managers and investors at each firm associate with each country at each point in time. Flexibly aggregating this firm-country-quarter-level data allows us to systematically identify spikes in perceived country risk ("crises") and document their source and pattern of transmission to foreign firms. While this pattern usually follows a gravity structure, it often changes dramatically during crises. For example, while crises originating in developed countries propagate disproportionately to foreign financial firms, emerging market crises transmit less financially and more to traditionally exposed countries. We apply our measures to show that (i) elevated perceptions of a country's riskiness, particularly those of foreign and financial firms, are associated with significant falls in local asset prices, capital outflows, and reductions in firm-level investment and employment. (ii) Risk transmitted from foreign countries affects the investment decisions of domestic firms. (iii) Heterogeneous currency loadings on perceived global risk can help explain the cross-country pattern of interest rates and currency risk premia.

Keywords: country risk, contagion, investment, textual analysis, earnings calls

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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, sell, or be otherwise exposed as affecting their investment and employment decisions. Although such notions of country risk and its transmission across borders feature prominently in policy circles and boardrooms, documenting the sources of country risk and its channels of global transmission has proven more difficult.

This paper aims to provide a micro-to-macro approach to studying the sources and transmission of country risk. We measure perceived country risk at the firm-country-quarter level by computing the share of time that global firms' executives and investors spend discussing risks related to countries around the world. In particular, we apply natural language processing (NLP) to more than 300,000 English-language conference call transcripts of publicly listed firms headquartered in 82 countries to measure the perceived risks and opportunities that each firm associates with each of the 45 largest economies in the world, collectively covering more than 90% of world GDP.

The primitive of our analysis and our key contribution is to measure how much risk firm i headquartered in country $d(i)$ associates with country c in quarter t. The major advantage of this granular approach to measuring country risk is that it allows for flexible aggregations: for example, we can separate global risks from those associated with particular countries, firms, and industries; separate the perceptions of different types of firms, such as financial vs. non-financial firms; and trace the transmission of risk between countries. A second advantage is that our approach to measurement is based on the semantic content of text. This enables us to distinguish variation in perceived risk (the second moment) from variation in perceived opportunities (the first moment), and to understand the sources of risks and opportunities that firms face.

After validating our granular measure, we successively aggregate it into four different dimensions. In the first step of our analysis we average across all firms in our sample to obtain an aggregate measure of risk for each of our 45 countries: "Country Risk."[1] To validate these aggregate measures we show that increases in a country's perceived riskiness

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[1] Thus we use "Country Risk" to mean the perceived risk associated with a given country, not as a synonym for sovereign default risk as it is occasionally used (i.e. Eaton et al. (1986)).

are accompanied by sharp declines in equity prices, increases in equity volatility, and increases in sovereign credit default swap (CDS) spreads.

We then use these aggregate measures of country risk to systematically describe its sources. We first identify local and global spikes in risk ("crises") over the last two decades. Leveraging the semantic content of our measures, we use the excerpts of underlying text that drive the spike in the aggregate series to pinpoint the specific concerns that led investors and executives to focus their conversations on risks associated with the country in question. In this sense, our approach allows us to identify the perceived sources of variation in Country Risk without much guesswork.

Having identified and described the perceived sources of two global and 33 country-specific crises in our sample, we turn to studying the transmission of these risks across borders. To this end, we construct a measure of the aggregate flow of risk from each origin country to each destination country by calculating the average country risk firms headquartered in country d associate with country c at time t (that is, we average across all i in d). We refer to this measure as "Transmission Risk" and we find that during normal times, the transmission of risk across countries follows a gravity structure. In other words, firms on average worry more about risks originating in countries geographically closer to them, that speak the same language, and that were in a common colonial relationship.

However, despite this regular pattern of transmission of risk during normal times, we find that these patterns shift significantly during periods of crisis. To systematically quantify these shifts, we calculate the pattern of transmission for each of the 33 major country-specific crises identified in the first step of our analysis, and then regress this crisis-specific pattern onto the regular pattern of transmission from that origin country in non-crisis times. We argue that the predicted values, slope estimates, and R^2 from these regressions usefully characterize how a crisis associated with a particular origin country affects the perceived risk of firms based in other countries. For example, our analysis shows that the beginning of the Global Financial Crisis (GFC) in the United States in 2008 and the start of the Coronavirus pandemic in China in the first quarter of 2020 are the two crises with the largest degree of global transmission in our sample: they transmit risk to firms in virtually all parts of the world. By contrast, crises originating in emerging markets (such at the Thai Floods of 2011 and the Egyptian Revolution of 2011) tend to come with strong bilateral transmission of risk:

firms in countries traditionally exposed to the two countries increase their risk perceptions disproportionately, but there is a relatively limited impact on risks perceived by firms in other parts of the world.

Aside from variation in the degree of global and bilateral transmission, we also find that crises differ dramatically in the degree to which historical exposure can predict the transmission of risk during the crisis. For example, we find that the Fukushima nuclear disaster of 2011 engendered the crisis with the most irregular transmission pattern in our sample: We observe a strong transmission to countries that usually have relatively little perceived exposure to Japanese risk. One example of such irregular transmission is the effect of this event on German politics, where German engineering firms with no observable commercial links to Japan worry about the effect of the Japanese disaster on the prospects for nuclear power and the price of electricity in Germany.

We also use a similar regression-based approach to classify the extent to which crises are transmitted through financial or non-financial firms. We document a large degree of heterogeneity across crises; for example, financial firms experience nearly double the increase in perceived risk as non-financial firms from the Italian sovereign debt crisis but only half the increase as non-financial firms from the US-China Trade War. Across the 33 crisis events in our sample, we find that sovereign debt crises and those originating in developed markets tend to have a significantly higher degree of financial transmission than other types of crises. Similarly, crises originating in emerging markets and sovereign debt crises tend to have relatively stronger bilateral transmission.

Having characterized the sources and transmission of perceived country risk during our sample, we then use our measures to make progress on three inter-related questions: (i) the role of a country's perceived riskiness for capital flows and sudden stops; (ii) the role of foreigners' risk perceptions and a firms' perceptions of foreign risk in driving firm-level investment and employment; and (iii) the role of country and global risks for exchange rates and safe-haven currencies.

First, using our aggregate time series, we show that elevated levels of Country Risk coincide with foreign investors pulling capital out of the country: a one standard deviation increase in a country's perceived riskiness is associated with a 47% reduction in capital inflows relative to the sample mean. Importantly, this result holds even when global factors are controlled for. In this sense, our measures provide a useful contrast to a large literature that has demonstrated the importance of common (global shocks) for capital flows, but so-far struggled to identify country-specific variables that can account for capital flows (Calvo et al., 1996, e.g.).

Consistent with its significant effect on capital flows, we also find that elevated Country Risk is associated with significant reductions in firm-level investment and employment of firms based in the country. These firm-level effects of their home-country's perceived risk are large and significant, even when controlling directly the firm's own perceived risk and when including firm and year fixed effects. We view these results as providing strong evidence that fluctuations in country risk are an important determinant of real allocations, above and beyond its associations with asset prices and capital flows.

To dig deeper on whose perceptions of risk matter most for allocations, we next create measures of aggregate Country Risk as perceived by different subsets of firms. That is, we obtain multiple aggregate measures of risk for the same country that allow us to distinguish the perceptions of foreign vs. domestic firms and those of financial vs. non-financial firms, among others. We find that it is the perceptions of foreign and financial firms that best account for the patterns of capital inflows and sovereign credit spreads. Similarly, firm-level investment and employment load even more on the country risk-perceptions of financial firms than they do on the perceptions of firms in the same sector. We view this evidence as strongly supportive of the view that variation of the risk perceptions of financial firms and foreign firms are key to understanding the role of risk in the allocation of capital across countries and firms (Rey, 2015; Miranda-Agrippino and Rey, 2020; Jiang et al., 2020).

Second, having demonstrated the importance of aggregate Country Risk, we next turn to studying the propagation of foreign risks at the firm-level. For each firm i in quarter t we sum our measures of risk across all foreign countries c. This yields a measure of how much foreign risk each firm is exposed to in each quarter. We show that when a firm's "Foreign Risk" increases, it significantly reduces its investment and employment. This reduction occurs above and beyond not just fluctuations in the Country Risk of the firm's own home country, but also the firm's other perceived risks (those not related to foreign countries). Notably, we provide evidence that this kind of spillover of Foreign Risk to firm-level outcomes often operates through complicated exposures that are not always well-approximated by customer-supplier relationships or the firm's observable foreign investments. These results thus provide clear evidence that the propagation of foreign risk is an important driver of firm-level outcomes.

Finally, we average our measure of country risk across firms and countries to create a single time series of Global Risk as perceived by managers and investors around the world. In addition to providing a natural means to classify global crises, we use this measure to explore the connection between Global Risk and exchange rates (Lustig et al., 2011). In particular, 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 Japanese yen, and, to a lesser extent the euro, 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 these theories more directly than was previously possible.

Related Literature This paper contributes to four strands of the literature. First, a large literature studies the effects of time variation in global risk and risk premia on business cycles, asset prices, and capital flows. An important set of papers studies how fluctuations in risks affecting global financial institutions generate common variation in asset prices and macroeconomic activity around the globe (Bekaert et al., 2013; Rey, 2015; Miranda-Agrippino and Rey, 2020; Jiang et al., 2020; Di Giovanni et al., 2021; Akinci et al., 2021). Another strand of this literature studies the role of time variation in country risk for determining the comovement of asset prices, exchange rates, and capital flows across countries (Verdelhan, 2010; Colacito and Croce, 2011; Stathopoulos, 2017; Colacito et al., 2018b). Other papers find that heterogeneity in the stochastic properties of countries' loadings on global risk are key to several puzzles in international economics (Lustig et al., 2011; Hassan, 2013; Gourio et al., 2013; Colacito et al., 2018a; Richmond, 2019). The predominant approach in this literature is to infer variation in risk from asset prices and other aggregate variables. We contribute by providing a measurement framework that can directly quantify risks perceived by decision makers at global firms, systematically distinguish perceived global from country-specific risks, and separate variation in risk (the second moment) from variation in positive and negative shocks (the first moment). Beyond providing data to test these theories, our findings that the risk perceptions of global financial firms appear particularly impactful for capital flows, and that currencies' loadings on our text-based measure of global risk account for differences in currency returns provide direct empirical support for two key predictions of in this literature.

Second, we contribute to a growing literature that generates measures of risk from text. Baker et al. (2016) use newspapers to measure economic policy uncertainty. Hassan et al. (2019) and Handley and Li (2020) use the transcripts of earnings conference calls and 10K disclosures to measure firm-level risks 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 two main respects. First, measuring risk at the firm-country-quarter-level allows us to flexibly decompose perceptions of sub-groups of decision makers and to measure the transmission of risk from countries to firms. Second, these same decompositions enable us to understand directly from the underlying text what events drive a given peak in risk. In this sense, our work relates closely to Calomiris and Mamaysky (2019), Baker et al. (2021) and Indarte and Xu (2021) who explore the origins of fluctuations in asset prices using textual analysis of newspaper articles.

Third, a large literature studies contagion, the notion that crises can spread suddenly and in unpredictable ways across borders – a perennial concern for policymakers (Forbes, 2012). A major challenge in this literature is that it is generally hard to measure how shocks, particularly shocks to perceived risks, propagate across borders. Existing approaches tend to rely on inferring the degree of contagion from asset prices (Forbes and Rigobon, 2002; Bekaert et al., 2014b; Bae et al., 2015), or measure the propagation of specific shocks between customers and suppliers (Boehm et al., 2019; Carvalho et al., 2021). Hassan et al. (2020) use textual analysis to study the international spillovers of Brexit-related risks during one specific episode. We contribute by providing direct measurement of spillovers of perceived risks across borders, by showing these spillovers affect firm-level outcomes, and that the pattern of transmission of risks can differ significantly between crisis and non-crisis periods.

Finally, our work contributes to the literature on 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, emphasizing the importance of "push factors." 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 to demonstrate the importance of perceptions of country-specific risk, particularly those of global financial institutions, in driving global capital flows. In this sense, we bridge the gap between 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.[2]

The structure of the paper is as follows. Section 1 introduces our methodology for measuring country risk at the firm level and defines and validates our measures at the micro and macro level. Section 2 studies the time series of Country Risk and identifies crises and their sources. Section 3 examines the transmission of risk across countries in crisis and non-crisis times. Sections 4 - 6 apply our measures to study capital flows, the firm-level effects of foreign risks, and safe haven currencies, respectively. Section 7 concludes.

1. MEASURING COUNTRY RISK AT THE MICRO LEVEL

In this section, we describe how we use natural language processing to measure $CountryRisk_{i,c,t}$ at the firm-country-quarter level and then aggregate it to various levels for our analysis. We begin with a description of the micro-level methodology and data and then turn to the aggregation framework. Our objective is to measure the amount of time executives and investors at firm i spend discussing risks associated with country c in their earnings conference call held in quarter t, $CountryRisk_{i,c,t}$. To automate this process, we will use standard tools from natural language processing in combination with training libraries sourced from the Economist Intelligence Unit Country Commerce reports to determine which phrases and parts of text refer to which countries.

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[2] Bekaert et al. (2014a) examine the role of political risk, estimated from sovereign spreads in driving foreign direct investment. Kalemli-Özcan (2019) explores the differential transmission of risk movements for emerging and advanced economies.

1.1. 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 11,829 firms that are headquartered in 82 countries. Generally, firms have four calls per year, timed to coincide with earnings releases. A standard conference call takes the form of a management presentation followed by a question and answer session with the firm's analysts. On average, each call lasts around 45 minutes (Matsumoto et al., 2011). In order to prepare the earnings call transcripts for analysis, we remove all metadata and non-alphabetic characters, but do not force words to be lower case in order to facilitate the subsequent country name matching (e.g. to distinguish Turkey from the animal turkey).

Appendix Table 1 summarizes our country coverage. Of the 11,829 firms, 6,623 are headquartered in the United States. The next three countries with the highest coverage are Canada, the United Kingdom, and Australia with 918, 548, and 434 firms, respectively. This ordering reflects Eikon's focus on English-language transcripts and firms headquartered in English-speaking countries are, of course, more likely to conduct their conference calls in English.[3] Nevertheless, as can be seen in the table, there are 34 countries for which we have data from at least 20 locally headquartered firms, and many firms report substantial (Worldscope segment) sales to almost all of our countries except for Iran and Pakistan. The smallest economy in our sample (Hungary) accounts for 0.23% of the world's GDP in 2002. We thus expect a number of our sample firms having at least some concern about the goings on in each of the 45 countries.

Appendix Figure 1 shows that the largest listed firms in any given country are disproportionately likely to appear in our dataset. In this sense, one can best think of our measures as capturing the concerns of multinational firms and global investors. Consequently, we do not expect our measures to be sensitive to risks that are not commercially relevant for these firms. For example, large and devastating floods in Mozambique may be enormously consequential for humanity, but we do not expect them to feature in earnings calls if they are not commercially relevant for global firms. Even so, and particularly for the United States and Canada, the data also include smaller listed firms. All of our main results are robust to

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[3] 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. (2021) for a detailed discussion of these issues.

stratifying the sample of calls in a variety of ways, for example by systematically excluding smaller firms.

1.2. *Country-Specific Training Libraries*

A key step in measuring country risk is to identify when the conversations in conference calls focus on particular countries. To do so, we assemble a training library $\mathbb{T}^c$ for each of our $c = 1, \ldots, C$ countries. The primary source for our training library is the set of Country Commerce Reports published by the Economist Intelligence Unit. The Economist describes these reports as "a practical guide to a country's business regulations and business practices."[4] The reports offer a number of desirable features for our purposes. First, because the reports are designed to cover the country's key economic institutions, they include a range of terminology relevant to each country. Second, the reports take a standardized form, allowing us to reliably compare across countries. 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 focus our analysis to the largest 45 economies, collectively covering 92.36% of world GDP in 2002.[5]

For each of these countries, we obtain all reports for 2002-2019, remove non-alphabetic characters, and remove all pairs of adjacent words (bigrams) that are likely to be used in conversational language.[6] We collect the remaining text in a single training library for each country. In addition, we obtain a separate list of the country's adjectival and demonymic names, the names of administrative subdivisions, and the names of towns with more than 15,000 inhabitants in 2018, to which we give special attention below.[7]

We then assign to each bigram a weight that indicates how strongly it is associated with discussions of the country. To this end, we employ a simple pattern-based sequence-classification method, which identifies the bigram's relevance for a given country as the

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[4] See the description in `https://store.eiu.com/product/country-commerce`.

[5] We thus exclude Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Kenya, Nicaragua, Panama, Peru, Uruguay, and Vietnam, as we believe discussions of these economies are too infrequent to return reliable measures. Nevertheless, all of our main findings are robust to including these countries in the analysis.

[6] To this end, we use all bigrams from the University of Santa Barbara Corpus of Spoken American English Du Bois et al. (2000-2005), which is a large collection of transcripts of "naturally occurring spoken interaction from all over the United States." We pre-process the speech corpus in the same way as we pre-process the Country Commerce Reports; in addition, we remove bigrams that contain a country or city name.

[7] All adjectival and demonymic forms of the country name are from Wikipedia and the CIA World Factbook; the remaining names of places and towns from geonames.org.

interaction of two terms (Sparck, 1972; Salton and McGill, 1983; Salton and Buckley, 1988).[8] The first is the bigram's relative frequency in the training library of country c; the second is the log of the bigram's inverse frequency across training libraries – a penalty for bigrams that also appear in the training libraries of many other countries:

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

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, N_C is the total number of training libraries, and N_b is the number of training libraries in which b occurs at least once. The first term, commonly denoted "term frequency" (tf), thus 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 do not also occur in discussions of most other countries. For example, while the bigram "in Brussels" may be frequent in the training library for Belgium, it also appears in the training libraries of many other EU countries, so that the bigram is likely less informative about whether or not a given text excerpt contains discussions of Belgium.

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. Finally, because the name of the country itself is particularly important for our exercise, we assign to it the maximum $\omega(b, c)$ of any bigram or unigram containing the country's name.[9] For this step, we convert all two-word country names (such as 'United

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[8] 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.

[9] Because country names themselves tend to appear as parts of lists in the Country Commerce Reports (e.g. as part of a list of bilateral withholding tax rates), they are sometimes get substantially downweighted. This is because their *idf* becomes small as they appear across more Country Commerce Reports. Assigning a floor as described here remedies this problem.

States') to unigrams so that all country names are treated equivalently.

Table 1 gives intuition for the workings of our algorithm by showing the top 20 bigrams by $\omega(b, c)$ in our training library for Turkey, Japan, and Greece. While for each country variants of the country's name are among the most important bigrams ("Turkish", "Japanese", "Greek"), we can see how successful the Country Commerce Reports are in identifying important country-specific phrases and institutions. For instance, in Panel A for Turkey we see that the third most important bigram is "Gazette No" and the sixth is "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, the capitalized bigram "Economy Trade," as well as the bigrams "Industry METI" and "the METI" all reference to the powerful Ministry of Economy Trade and Industry. Similarly "the JFTC" and "the JPO" refer to the Japanese Fair Trade Commission and the Japanese Patent Office, respectively. For Greece, we see that the fifth most important bigram is "ND government," a short-hand referring to the "New Democracy" center-right political party; and "an AE" is similar to a US limited liability company. 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 names and phrases would be most useful in identifying conversations about a given country. Our approach — systematically extracting the expertise embedded in the Country Commerce Reports to identify the country in question — is therefore more comprehensive than simply waiting for a call participant to say "Turkey" or "Japan."

1.3. Measuring Firm-Level Country Risk, Sentiment and Exposure

With our country-specific training libraries in hand, we can turn to the measurement of country risk at the firm level. To create our measure of Country Risk, we build on the methodology of Hassan et al. (2019) by counting the number of mentions of bigrams indicative of conversations about country c in conjunction with a synonym for risk or uncertainty:[10]

$$CountryRisk_{i,c,t} = \frac{1}{B_{it}} \sum_{b}^{B_{it}} \{1[|b - r| \leq 10] \times \omega(b, c)\}, \tag{2}$$

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[10] We obtain all synonyms for risk, risky, uncertain, and uncertainty from Oxford Dictionary. Appendix Table 2 lists the top 100 risk synonyms.

where $b = 0, 1, ...B_{it}$ are the bigrams contained in the earnings call of firm i at time t and r is the position of the nearest synonym of risk or uncertainty.[11] Country Risk thus counts the number of mentions of country c within ten words of a synonym for risk or uncertainty, weighted by $\omega(b, c)$. This means bigrams that the training library more confidently ascribes to a given country also receive more weight. We then divide this sum by the total number of bigrams in the transcript to account for differences in the length of the earnings call.

To complement our key measure of Country Risk, we also create measures of firm-level exposure and sentiment. Country Exposure proxies for the overall perceived exposure a firm has to a given foreign country – it is a weighted count of the number of mentions of a given foreign country, again divided by the length of the transcript:

$$CountryExposure_{i,c,t} = \frac{1}{B_{it}} \sum_{b}^{B_{it}} \omega(b, c). \tag{3}$$

Finally, we construct a measure of country sentiment, which we primarily use as a control for whether the firm receives good or bad news about its activities relating to country c. Instead of conditioning on bigrams appearing close to a synonym for risk, this measure counts positive or negative tone words ("sentiment") used in conjunction with the same country-specific bigrams:

$$CountrySentiment_{i,c,t} = \frac{1}{B_{it}} \sum_{b}^{B_{it}} \left\{ \left(\sum_{g=b-10}^{b+10} S(g) \right) \times \omega(b, c) \right\}, \tag{4}$$

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.

1.4. Aggregations of Country Risk

Having measured $CountryRisk_{i,c,t}$ as the share of the conversation between management and investors at firm i headquartered in country $d(i)$ spent discussing risks associated with country c –note that this notion of risk captures all types of risk that listed firms may be

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[11] While one might worry this measure would be contaminated by negated phrases such as "less risky," from examining the underlying text snippets we concluded this is not a significant concern in practice.

concerned about, including (but not limited to) regulatory, supply chain, sovereign debt, environmental and political risks – we now turn to using this micro, firm-based, measure of country risk to achieve four core objectives.

First, to construct country level measures of risk we aggregate our firm-level measure of country risk across a set of firms K,

$$CountryRisk^{K}_{c,t} = \frac{1}{N_K} \sum_{i \in K} CountryRisk_{i,c,t}, \tag{5}$$

where N_K is the number of firms of type K in the dataset. In other words, $CountryRisk^{K}_{c,t}$ captures the average perceived risk emanating from country c at time t for the set of firms K. The power in this approach is that performing this type of aggregation for different sets of firms K will deliver measures of country risk capturing the risk-perceptions of different types of firms around the world. While our primary measure includes the full set of firms ($K = ALL$) for which we can measure $CountryRisk_{i,c,t}$, we also consider separately the perceptions of foreign firms (NHQ), financial firms (FIN), American firms (US), and firms only in a particular industry.

Second, we measure the aggregate transmission of risk from each origin country to each destination country at each point in time by summing over the risk that all firms based in country d perceive in country o at time t:

$$TransmissionRisk_{o \to d,t} = \frac{1}{N_d} \sum_{i \in d} CountryRisk_{i,o,t} \tag{6}$$

The measure is designed to capture how much risk is transmitted from country o to country d. We refer to this measure as Transmission Risk.

The third strand of our analysis explores the amount of foreign risk facing a particular firm. At the firm-quarter level, we define

$$ForeignRisk_{i,t} = \sum_{c \neq d(i)} CountryRisk_{i,c,t}. \tag{7}$$

for firm i at time t is the sum of the risk the firm associates with all countries around the world, excluding its home country.[12] We refer to this micro-level measure as Foreign Risk and use it to assess the firm-level spillovers of risk across borders.

Because the latter two aggregations sometimes rely on only a few dozen observations, we usually replace

$$CountryRisk_{i,c,t} \approx CountryExposure_{i,c,t} \times \widetilde{CountryRisk}_{c,t}^{NHQ}, \tag{8}$$

in (6) and (7), where $\widetilde{CountryRisk}_{c,t}^{NHQ}$ is our aggregate measure of country risk as perceived by all foreign firms from (5), after projecting it on country and time fixed effects. We find this procedure reduces measurement error because it relies on individual transcripts only to capture firm-quarter level variation in exposure, but harnesses information from the full sample to measure over-time variation in the origin country's riskiness. This reduction in measurement error makes the firm-quarter and origin-destination-quarter level observations from (6) and (7) easier to interpret (in that it reduces spurious variation), but has little effect on our main results, as we show below.

Finally, we aggregate our measures across all firms and destinations to create a text-based measure of global risk as the average of $CountryRisk_{i,c,t}$ over firms and countries

$$GlobalRisk_t = \frac{1}{N_I}\frac{1}{N_C}\sum_{i\in I}\sum_{c\in C} CountryRisk_{i,c,t}.$$

While our focus is on country risk, we conduct analogous aggregations of the exposure and sentiment firm i has towards country c at time t, and use them as controls where appropriate.

1.5. Validation and Summary Statistics

Before turning to our analysis of country risk, we validate our measures at the micro and macro-level.

Firm-level Exposure In Table 2, we validate our firm-level exposure measure. In particular, we regress firm i's average exposure to country c, $CountryExposure_{i,c} \equiv (1/T)\sum_t CountryExposure_{i,c,t}$ on other firm-level variables that should

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[12] $DomesticRisk_{i,t}$, or the risk the firm associates with its home country, would simply be $CountryRisk_{i,c(i),t}$, where $c(i)$ denotes the home country c of firm i.

correlate with a firm's material exposure to a country. If our text-based exposure measure is systematically behaving as it should, we would expect it to covary strongly with these variables.

The first variable we consider is whether the firm in question is headquartered in country c as listed in Compustat (the most recent `loc` variable, 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 call participants to discuss that particular country more during their earnings calls. To measure this variable, we use the Geographic Segment data from Worldscope.[13] Third, we use a firm's subsidiaries in 2016, as listed in Bureau van Dijk's Orbis database, as another observable exposure to a country. If firm i has a subsidiary in country c, we would expect it to discuss that country more during its earnings calls.

The regressions in Table 2 provide strong confirmation for our measure. Firms are 2.3 standard deviations more exposed to their headquarter country than other firms, and firms with an export link are on average 1.2 standard deviations more exposed than other firms. In the third column, we repeat the exercise using a dummy variable for whether a firm has a subsidiary in a given country. We once again find that the presence of a subsidiary dramatically increases firm level exposure to a country. These findings continue to hold in columns 4 and 5, when we consider the three variables simultaneously with and without country fixed effects, respectively.

Aggregate Country Risk and Sentiment Having documented the reliability of our exposure measure at the firm-level, we next turn to the aggregate measures. Table 3 presents summary statistics for our measures of country risk and sentiment.[14]

First, consistent with recent work that has emphasized the co-movement of global risk

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[13] This data is extracted from annual reports, where under GAAP and IFSR accounting rules, firms need to report all sales destinations from which they earn more than 10% of their revenue or have a "material interest." We therefore classify the firm as exporting to a particular country if the country is listed in this report in 2016. However, note this coarse measure will miss some 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, the Worldscope data would not classify the firm as having sales links to China or Japan.

[14] 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.

across countries (Rey, 2015; Miranda-Agrippino and Rey, 2020), we find a strong common component in both Country Risk and Country Sentiment. In particular, the first principal component of Country Risk explains 65.4% of country level variation. Similarly we find that that the first principal component of Country Sentiment explains 89% of the country level variation. We return to this issue in Sections 4 and 6, where we show direct evidence that these global co-movements give rise to episodes of retrenchment in capital flows and a strong factor structure in exchange rates.

Second, we find that the mean within-country correlation between $CountryRisk_{c,t}$ and $CountrySentiment_{c,t}$ is -0.28. As argued by Berger et al. (2020), we can thus confirm that the first moment (Country Sentiment) and second moment (Country Risk) are negatively correlated, where higher risk is often associated with lower sentiment (that is, bad news).[15] Consistent with this pattern, we also find that Country Risk is strongly countercyclical, with cyclicality measured using country level real GDP growth rates. By contrast, Country Sentiment is pro-cyclical.[16]

Nevertheless, the two series are not mirror images of each other, and they often diverge for economically important reasons. For instance, in Appendix Figure 2, we plot the time series of Country Risk and Country Sentiment (reversed) for Mexico. While the correlation between the two variables is -0.32, we note a major divergence between the two around the fourth quarter of 2016. At the time, the election of Donald Trump and his harsh rhetoric against Mexico caused a major spike in perceived risk in Mexico, yet Sentiment barely moved. We view this as validating our use of Sentiment as the first moment and Risk as the second moment: Trump's election did not change the mean economic outlook for Mexico, but it did dramatically increase its perceived volatility going forward. This example holds true more generally, where both measures have meaningful independent variation.

Finally, we provide further validation for these measures by documenting their strong co-

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[15] Thirty synonyms for risk or uncertainty used in our sample of earnings conference calls also have a negative connotation according to this definition. Examples include 'exposed,' 'threat,' 'doubt,' and 'fear.' Taking into account their frequency as found in our sample of earnings calls, this represents 9.4% and 0.97% of all synonyms for risk and negative sentiment, respectively. Our measures thus explicitly allow speakers to simultaneously convey risk and negative sentiment. However, this does not interfere with our ability to disentangle risk from sentiment: By definition, when we include both measures for risk and sentiment in a regression, we control for any variation that is common to each other (as a result of overlapping words).

[16] 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.

movement with asset prices. Table 4 shows that when Country Risk increases and Country Sentiment decreases stock returns fall. In particular, in column 2, a one percent increase in Country Risk is associated with a 0.213 (s.e.=0.035) percentage point drop in the country's (MSCI) stock return index, while a one percent increase in Country Sentiment is associated with a 0.267 (s.e.=0.050) percentage point increase in stock returns. The following columns show a similar pattern for CDS spreads: as country risk rises and sentiment falls, CDS spreads significantly increase. By contrast, column 6 shows that changes in realized volatility are *not* significantly associated with changes in Country Sentiment (the first moment), but instead load only on variation in Country Risk (the second moment). A one percent increase in Country Risk is associated with a 0.103 (s.e.=0.023) percentage point increase in realized volatility. To summarize, our validation shows that countries' stock prices drop and become more volatile when they are perceived to become riskier, and their CDS spreads widen.

2. Sources of Country Risk

Having validated our measures, we next systematically identify spikes ("crises") and demonstrate how we can use the underlying text to identify to what events managers and investors attribute to these spikes in country risk.

Figure 1 shows the time series of Greek Country Risk as an example. The top line 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, with the grey shaded region capturing the variation from non-financial firms. Aside from the Global Financial Crisis of 2008-2009 and the Coronavirus pandemic of 2020 (which, as we will show below, feature in all of our Country Risk graphs), the series shows three clear Greece-specific peaks, each attributable to key episodes in the Greek sovereign debt crisis. The first begins with the initial realization in the second quarter of 2010 that Greece had misreported its debts and that foreign banks were 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 is driven by concerns about Syriza's referendum and the possibility of a Greek Exit from the European Monetary Union. To arrive at this interpretation, we systematically read the 30 snippets of text with the highest $\omega(b, \text{``}\textit{Greece}\text{''})$ from the 100 transcripts with the highest level of $CountryRisk_{i,Greece,t}$ in the quarter in question and highlight the common theme in these conversations. Below the graph, we show two examples of text for each of the three episodes. As might be expected given the 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 Thailand as our second example. In this case, we see the major spikes in Thai risk come from the GFC, the severe flooding in late 2011, the military coup in the third quarter of 2014, and the Coronavirus pandemic. 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. We also see this in the high-impact snippets reported below the table. In contrast to the Greek snippets, where financial firms discuss the effects of the Greek crises on financial markets, here we see non-financial corporates discuss the risk of supply chain disruption.

As our third example, we examine the United States in Figure 3. The US occupies a unique position in our dataset as approximately half of our sample firms are based in the US. Therefore, for the US, it is particularly informative to decompose aggregate Country Risk, $CountryRisk_{USA,t}^{ALL}$ into US risk perceived by American firms, $CountryRisk_{USA,t}^{HQ}$, and the US risk perceived by non-American firms, $CountryRisk_{USA,t}^{NHQ}$. Again using our systematic reading of high-impact text snippets, the figure labels a number of spikes in US risk. Most notably we see firms discussing risks associated with the Iraq War, the GFC, the Deepwater Horizon oil spill, the fiscal cliff negotiations in late 2012, and the election of Donald Trump in 2016. While for most of these episodes foreign and domestic perceptions of US Country Risk moved in lockstep, in other instances the perceptions diverged. In particular, the Iraq War, and to a lesser extent the election of Donald Trump, saw a dramatic increase in foreigners' perceptions of US Country Risk, with the increase coming from American firms far more muted. By contrast, the concern around the Fiscal Cliff was far more concentrated in American firms. We make more systematic use of this kind of divergence in risk perceptions in our econometric analysis below.

Global and Local Crises

We now use our Country Risk measures to examine the recent history of each of the 45 countries in our sample. To structure our analysis we find it useful to (a) use a standardized definition of when a country or a set of countries is in a "crisis," as perceived by global investors and executives; and (b) distinguish between global and country-specific "crises." In particular, we define a global or local "crisis" to be a spike in the relevant time series that is larger than two standard deviations above the sample mean (after projecting on country fixed effects). While the threshold of two standard deviations is clearly arbitrary, it is a natural starting point; moreover, it is straightforward for future users of the data to change this threshold according to their specific research question or policy objective.

In order to identify global crises, we use our measure of Global Risk, which is calculated as the mean of Country Risk across our 45 countries. Figure 4 plots Global Risk as the solid blue line. A number of features of Global Risk are immediately apparent. First, there are two major spikes: the GFC and the recent global pandemic. In addition, the Great Moderation (e.g. Bernanke (2004), Galí and Gambetti (2009)) is clearly visible in the time series, with Global Risk from 2002-2006 lower than the entire period since the GFC. Moreover, the graph also shows a spike in 2011q4 during the height of the European sovereign debt crisis. Figure 4 also plots the line of two standard deviations above the sample mean (the dashed red line) and its associated global "crises" (marked with grey dots). Accordingly, the two global crises that we identify are the GFC during 2008q4-2009q2 and the recent global pandemic during 2020q2-2020q4 (with the European crisis remaining slightly below this threshold).

We next turn to identifying country-specific crises. Using our aforementioned threshold of two standard deviations, we consider a country to be in a crisis when its perceived level of Country Risk is at least two standard deviations above the sample mean. We additionally require the quarter to not also be a global crisis. Thus if a quarter in a country's time series satisfies those two conditions, we consider it a local crisis and mark it with a red dot in the country's graph. For each of these episodes we once again read all high-impact snippets of text of the top 30 firms that associate the highest risk with the country, and label the episode to summarize firms' predominant concerns at the time.

In Figure 5, we plot the aggregate time series of Country Risk of the twenty countries that have a local crisis according to our definition, with the ordering reflecting the number of country-specific crises. Appendix Figure 3 reports the equivalent graphs for all remaining countries that do not have a country-specific crisis.[17] In addition to identifying crises at the country level (column 1) and summarizing the predominant source of risk during each episode (column 2), the figure in column 3 summarizes the pattern of transmission of each crisis to foreign firms. In particular, the label "FIN" denotes disproportional transmission through foreign financial firms, while "NFC" indicates disproportional transmission to foreign non-financial corporates. The indicator "I" denotes crises with a particularly "irregular" transmission pattern. We discuss these classifications in detail in Section 3.

The figure shows a number of notable features. First, the time series for most countries show clearly the impact of the two global crises, although there is also substantial idiosyncratic variation. Second, for all but two of these crises, a clear narrative emerges from reading the discussions between executives and investors, so that we are able to label the episodes. As expected, many of the countries with the largest number of local crises are emerging markets. The time series for China shows four crisis episodes. The first two in 2012 and 2015-16 both center on the risk of lower growth and financial volatility. These are followed in 2018-2019 by the escalating US-China trade war. The final crisis, in the first quarter of 2020 captures the onset of the Coronavirus pandemic (which becomes a global crisis in the second quarter according to our definition). Brazil records its first crisis in 2002 during the turmoil leading up to the election of Lula da Silva, as well as a long-period of upheaval surrounding the corruption scandals and recession of 2015-2016. Great Britain records consecutive crises associated with the Brexit referendum, and then the possibility (and later execution) of a hard Brexit. Russia shows an economic crisis in 2011 and a long period of uncertainty surrounding the Crimean invasion 2014-15, and the concurrent sanctions and depreciation of the ruble. Other headline-grabbing episodes picked up by our measures of country risk include the Hong Kong protests of 2019-20, the European Sovereign Debt Crisis, Middle East wars, the Egyptian revolution of 2011, and the Fukushima disaster in Japan.

Aside from these prominent episodes, we record two episodes (Norway and Poland), where firms discuss local risks that are not tied to a single event at all. We label these instances

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[17] We also consider countries as having no local crises if its only crises immediately follow a global crisis and firms' concerns during that spike in measured country risk are congruent with either the GFC or the coronavirus pandemic.

"co-occurrence of local concerns," where for example for Poland in 2020q1, Banca Comerical Portugues SA discusses higher capital charges related to currency risk, 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.

Third, 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 (commercially relevant) risk 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 and the second is the failed Iranian Green Revolution of 2012.[18] These examples also highlight an important feature of our approach: because we rely on discussions 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 be.

3. THE TRANSMISSION OF COUNTRY RISK

Having described the sources of aggregate variation in country risk, we now turn to understanding the pattern of transmission of risks around the world. We begin by examining the regular flow or risks from a given origin country to a given destination country, before examining how different types of crises deviate from this usual pattern.

3.1. Regular Transmission of Country Risk

Table 5 lists the top origins and destinations of average Transmission Risk for a selection of countries,

$$\overline{TransmissionRisk}_{o\to d} = \sum_t \frac{1}{T} TransmissionRisk_{o\to d,t}.$$

From a cursory glance over the table, we can see that firms tend to worry more about risks originating in countries geographically closer to them. In addition, one can immediately

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[18] At 1.82 standard deviations, Country Risk of Iran is just below our threshold of two standard deviations in 2012q1; however, because of its clear spike we nevertheless include it in Figure 5.

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 4 we confirm this conjecture more systematically. Building on a large literature in trade and international finance (Head and Mayer (2014)), we run a gravity regression of bilateral Transmission Risk with source and destination fixed effects. We find that distance, geographical contiguity, and a common language are all significant explanatory factors for the transmission of risk across countries.

To add texture to this analysis, Appendix Table 5 decomposes the aggregate flow of risk to the United States by showing the top five origins of transmission risk for ten sectors within the United States. The table lists the firm in the S&P 500 with the largest transmission risk from each origin as an example. It shows 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 local oil resources, while Conoco Philips is involved in litigation trying to claw back assets expropriated in Venezuela.

3.2. Crisis Transmission

Next, we explore the extent to which the patterns of transmission change during crises to examine how these extreme events propagate around the world. We construct separate measures of $TransmissionRisk_{o \to d,\tau}$ for each of the crises listed in Figure 5. We then compare the pattern of transmission during each crisis with the usual pattern of transmission from that origin country by regressing the pattern of transmission during crisis τ in country o onto the usual pattern of transmission during non-crisis periods,

$$TransmissionRisk_{o \to d,\tau} = \alpha_{o,\tau} + \beta_{o,\tau} \overline{TransmissionRisk}_{o \to d, t \notin S^c} + \epsilon_{o \to d,\tau}, \tag{9}$$

where S^c is the set of time periods during which country c is in crisis.

Global Impact, Bilateral Transmission, and Regularity of Transmission. We illustrate the projection in specification (9) with the help of six example figures, plotted in Figure 6, that summarize how each crisis is transmitted to foreign firms. To understand these figures, note first that the 45 degree line represents the usual transmission of risk during non-crisis periods. The farther away a destination country is from this line, the more concerned it is with risks emanating from the origin country during the crisis than normal. Further, we refer to the the median predicted value from this projection as the crisis' "global impact" (how much risk is transmitted to the median country?);[19] and to the slope of the regression line as the degree of "bilateral transmission" (how much more concerned are countries that are traditionally concerned about the origin country?). Finally, the R^2 of the regression line measures the "regularlity" of transmission – the degree to which transmission during a crisis follows the usual pattern of transmission during non-crisis periods.

Panels (a) and (b) of Figure 6 plot the two crises with the highest global impact in our sample. Panel (a) shows the start of the GFC – the transmission of risk from the United States to foreign firms in 2008. During the start of the GFC, all recipient countries are clearly above this line, speaking to the significant impact this crisis had on countries around the world. Further, the GFC was a crisis with a high global impact (the second highest in our sample) affecting all countries regardless of their historical exposure to the United States, but only moderate bilateral transmission (the fitted line is close to one). Moreover, in keeping with this global transmission pattern, the GFC also stands out for its high degree of irregular transmission (an R^2 of 0.55 – much lower than most other crises in our sample). Panel (b) shows the same relationship for the beginning of the Coronavirus pandemic in China in the first quarter of 2020. It has the crisis with the highest global impact in our sample. All countries are again well above the 45 degree line, but now we also see a much larger degree of bilateral transmission to nearby countries: Hong Kong, Taiwan, Singapore, and Taiwan.

Panels (c) and (d) plot the two crises with the strongest bilateral transmission patterns, the Thai floods of 2011-12 and the start of the Greek sovereign debt crisis in 2010. Turning first to Thailand, we see that the countries that experience the largest increase in Transmission Risk, Singapore and Japan, are the countries that are also most exposed to Thailand

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[19] We prefer to use the median rather than the mean because the distribution is skewed to the right.

during non-crisis times. (The slope coefficient signals a 4.00 (s.e.=0.41) -fold increase in risk transmission to these countries.) Following the same method we used to identify the sources of country risk, we can again read influential snippets of text associated with each observation in the plot. We see, for example, that Japanese firms discuss the supply chain disruptions emanating from the Thai floods. Countries generally less exposed to Thailand, by contrast, discuss risk propagating from the floods dramatically less (the bulk of observations cluster close to the 45 degree line). Similarly, looking at the pattern of risk during the start of the Greek crisis in Panel (d), we see high levels of Transmission Risk to firms based in other euro area countries (increasing by a factor of 2.80 (s.e.=0.34), yet little propagation to countries outside the Euro area that are traditionally less exposed to Greece. This strongly local pattern of transmission is in stark contrast to the much more global transmission pattern at the start of the GFC in Panel (a).

Panels (e) and (f) of Figure 6 plot the pattern of transmission risk for the Hong Kong Protests and the Fukushima Nuclear Disaster, the crises with the highest and lowest R^2 in our sample, respectively. In the case of Hong Kong, one sees a tight fit around the regression line (with an R^2 of 0.94). Countries generally most exposed to Hong Kong, such as Singapore, Malaysia, China, and Taiwan, see large increases in risk, with other countries such as the United States, seeing relatively small increases. We contrast this regular transmission with Fukushima in Panel (f), the crisis with the lowest $R^2_{o,\tau}$ in our sample (0.28).[20] The plot shows large dispersion and unusually large impacts in Germany and Taiwan, among others. Systematically examining high-impact snippets of text from German firms reveals the reason: the Fukushima disaster was the ultimate catalyst for the end of nuclear power in Germany and thus threatened the viability of an entire industry in this faraway location, including that of firms that have no observable commercial links with Japan whatsoever. Other outliers are attributable to the unusual effects this event had on supply chains, fishing, and the insurance industry, among others.

Financial Transmission. Having illustrated these major features of the pattern of transmission, Figure 7 goes one step further by plotting separately transmission to financial (triangles) and non-financial firms (squares) for the case of the Italian Sovereign Debt Crisis

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[20] For a detailed analysis of this event also see Boehm et al. (2019) and Carvalho et al. (2021).

of 2011. The figure clearly shows that, in this instance, the transmission of Italian risk to foreign countries operated almost exclusively through financial firms (the triangles are far above the 45 degree line, while squares are not).

To examine the degree of financial transmission more systematically, we re-run specification (9) at the firm-level and add a dummy for financial firms:

$$(10)\;\; TransmissionRisk_{o \to i,\tau} = \alpha_{o,\tau} + \alpha^{Fin}_{o \to i,\tau} \mathbb{1}_{Fin} + \beta_{o,\tau} \overline{TransmissionRisk}_{o \to i, t \notin S^c} + \epsilon_{o \to i,\tau}.$$

If $\alpha^{Fin}_{o \to i,\tau}$ is positive, this means that during the crisis in question, financial firms saw their transmission risk from country o increase disproportionately more than did non-financial firms.

Transmission Patterns. Table 6 provides a concise summary of all patterns introduced in this subsection. In particular, it lists for each of our 33 local crises, the degree of financial transmission from specification (10), along with the three other features of crisis transmission from specification (9) outlined above. The table facilitates an easy comparison of the transmission pattern across the different crisis episodes in our sample.

For each crisis, column 1 shows its global impact (the predicted impact on the median country, normalized with the (panel) standard deviation of country risk). Immediately, we can see that the measure delivers a sensible ranking, with – as mentioned before – the start of the Coronavirus outbreak in 2020q1 in China ranked as the crisis with the largest global impact followed by the start of the GFC in the United States from 2008q1-2008q3. While large countries dominate the top of the rankings (with Japan, China, and the United States occupying the top 8 spots), we see the Greek sovereign debt crisis, Mexican trade war, Thai floods, Turkish coup, and Brexit follow. Crises with relatively low levels of global impact are the Green Revolution in Iran, and the echoes of Brexit and the European Sovereign debt crisis in Ireland, Italy, and Spain. Column 2 shows the degree of bilateral transmission. Because a coefficient of one indicates unchanged transmission relative to normal times, asterisks mark slope coefficients that are statistically significantly different than this benchmark (rather than zero). We find that most of the crises in our sample feature significant bilateral transmission – with significantly more severe transmission to traditionally exposed countries. Column 3 gives the regularity of transmission (the R^2 of specification (9)); and column 4 reports the relative financial transmission as the ratio of $\alpha^{Fin}_{o\to i,\tau}/\alpha_{o\to i,\tau}$ from specification (10), which measures the degree of transmission to foreign financial firms relative to the non-financial corporate sector. Asterisks indicate crises where $\alpha^{Fin}_{o\to i,\tau}$ is statistically distinguishable from zero (either positive or negative).[21]

In general, Table 6 shows a large degree of heterogeneity across crises, even when reducing our data to these four key indicators. To elicit these general patterns more systematically, we manually classify crises into four (possibly overlapping) groups: Developed Market crises, Natural Disasters, Sovereign Debt crises, and Political Instability, using the sources of each crisis as listed in Figure 5 as a guide. In Appendix Table 6, we then regress our four transmission indicators from Table 6 on dummies for these four different types of crises. A number of general patterns emerge. First, in column 1, we see that crises originating in developed markets and those centering on sovereign debt propagate disproportionately through foreign financial firms. Second, crises in emerging markets tend to propagate more bilaterally (locally) than those originating in developed markets. Third, none of these features seem to predict the degree of regularity of the transmission. In this sense, it seems hard to predict what type of crisis will propagate regularly as opposed to irregularly.

4. Capital Flows and Sudden Stops

Having characterized the sources and transmission of country risk, we now apply our measures to reexamine three classical questions on the role of country risk in the propagation and transmission of shocks across borders. We begin by exploring the relationship between country risk, capital flows, and sudden stops. A large literature, beginning with Calvo et al. (1996) studies the relative importance of push (i.e. global or source-country) factors and pull (i.e. recipient country specific) factors driving capital flows. Generally, the literature has found that capital flows contract in response to bad global news, but it has proven more difficult to identify local factors that can account for country-specific variation in capital inflows.

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[21] This test is also the basis for marking crises for disproportionate transmission to foreign financial firms (“FIN” in Figure 5 if positive and “NFC” if negative). Crises marked with an “I” in Figure 5 are those in the bottom quartile of Column 3 in Table 6.

Using our global and country-specific measures of Country Risk, we are able to revisit this result. In Panel A of Table 7, we examine country risk as a driver of global capital flows. Column 1 shows a univariate regression of total capital inflows to a country scaled by the stock of foreign investment[22] on Global Risk (conditional on country fixed effects). Consistent with the importance of push factors and the "fickleness" of capital flows (Caballero and Simsek, 2020), we find a negative and statistically significant effect. When we include Country Risk in column 2, the coefficient on Global Risk is attenuated, while the coefficient on Country Risk is negative and highly statistically significant: A one standard deviation increase in a country's risk is associated with 0.759 (s.e.=0.188) percentage point drop in inflows – corresponding to a 47% 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 insignificant. By contrast, we see that the coefficient on Country Risk 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 partial out all possible global variation in push factors. Column 5, also adds Country Sentiment to the specification. As expected, we find that more positive news about a country (more positive sentiment) is associated with a significant increase in capital inflows (0.724, s.e.=0.225). The coefficient on Country Risk is reduced by about half but remains strongly negative and statistically significant at the 5% level (-0.423, s.e.=0.184).

Panel B repeats this analysis, but replaces total capital flows on the LHS with a dummy for a "Sudden Stop" episode from Forbes and Warnock (2012, 2021). A sudden stop is measured as a major reduction in capital inflows, a feature the literature has emphasized as a key driver of crises in emerging markets Mendoza (2010). We find a similar pattern as for total capital inflows, with increases in both Country Risk and decreases in Country Sentiment strongly associated with sudden stop episodes.[23]

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[22] We measure total inflows as the sum of portfolio inflows, FDI inflows, and Other inflows from the Balance of Payments data. The outstanding stock of debt is defined equivalently using International Investment Position data. While we normalize capital flows by the outstanding stock for simplicity, Burger et al. (2019) demonstrate the strong explanatory power of lagged portfolio weights as a normalizing factor. Appendix Table 7 details the source of all variables used in this and all subsequent sections.

[23] Consistent with these results, rises in Global Risk but not Country Risk are associated with retrenchment (as defined by Forbes and Warnock (2021)), episodes during which capital holders return large amounts of funds to their home countries. See Appendix Table 8.

In Table 8, we unpack our aggregate Country Risk series to better understand the sources of its explanatory power. The first column of Panel A replicates our regression of capital inflows on Country Risk as perceived by all firms, $CountryRisk_{c,t}^{ALL}$ (this time without controlling for GDP growth, but with the full set of country and time fixed effects). Next, we instead include Country Risk as perceived by all firms headquartered in the United States. We find that the point estimate increases slightly. The coefficient decreases when we instead look at the effect of Country Risk as perceived by foreign firms, $CountryRisk^{NHQ}$ but continues to be strongly statistically and economically significant. We conclude that the information content of these three broad alternative aggregations of country risk are largely similar.[24]

Column 4 compares the information content of Country Risk with that of the World Uncertainty Index (WUI) (Ahir et al., 2018), a measure of uncertainty available for a much larger set of 143 countries. Rather than operating on firm-level texts, the WUI counts the frequency of synonyms of risk and uncertainty directly in the EIU Country Reports. While the WUI is weakly positively correlated with our measure of Country Risk (the within-country correlation is 0.19), controlling for it in the regression changes the coefficient on $CountryRisk^{NHQ}$ only slightly. Appendix Table 9 expands on this theme, comparing and contrasting the information content of $CountryRisk^{ALL}$ with that of both WUI and country-level indices of Economic Policy Uncertainty (EPU) (Baker et al., 2016), which are available for 22 countries and measure specifically the part of country risk associated with economic policy.[25]

In Panel B, we consider the differential explanatory power of heterogeneous risk perceptions.[26] Column 1 contrasts the explanatory power of Country Risk as perceived by the firms

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[24] The correlations between the three measures are all above 92%.

[25] The within-country correlation between these 22 EPU measures and $CountryRisk^{ALL}$ is 0.41. Across specifications, we find that these alternative text-based measures also tend to correlate with capital inflows, CDS spreads, as well as the firm-level outcomes we discuss in detail below, with the the predicted sign. However, the table also shows that $CountryRisk_{c,t}^{ALL}$ is more strongly associated with all of these aggregate and firm-level outcomes. The reason for this better fit is likely twofold. First, both alternative text-based measures ultimately rely on the writings of journalists rather than on conversations between executives and investors at global firms, who may be more directly involved in decisions moving capital and investments. Second, both WUI and EPU are constructed by counting the frequency of mentions of risk (or economic policy uncertainty) in national publications, allocating risk based on who is writing the text (a newspaper in a given country and the analyst at EIU responsible for a country, respectively), whereas our procedure isolates explicitly which country the speaker associates a given risk with. In this sense, both alternative measures are conceptually more similar to $\overline{FirmRisk_{i,t}}_{c,t}$ (discussed below) than $CountryRisk_{c,t}^{ALL}$.

[26] While we focus on exploring the relative explanatory power of different aggregations, one could instead

based in that particular country (HQ) and firms based in other, foreign, countries (NHQ). We see that the perceptions of domestic firms (HQ) are insignificant, demonstrating that, on average, the explanatory power for capital flows is coming from foreign rather than domestic risk perceptions. While it is possible that this pattern arises because perceptions of domestic firms are measured with more error than the perceptions of the more numerous foreign firms, it also suggests that foreigners' perceptions may be an important variable in and of itself, 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 Column 2 we find similar results when instead proxying for domestic perceptions with the average number of times participants in earnings calls of firms headquartered in the country mention a synonym for risk or uncertainty, $\overline{FirmRisk_{i,t}}_{c,t} := (1/N)\sum_{i\in c(i)} FirmRisk_{i,t}$, 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 measure captures the total risk as perceived by firms based in the country, regardless of where this risk is coming from. Remarkably, adding this control again barely attenuates the coefficient on $CountryRisk^{NHQ}$. This finding shows clearly that our procedure of 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 columns 3 and 4, we consider the relative explanatory power of the risk perceptions of financial (FIN) and non-financial (NFC) firms, motivated the literature on the Global Financial Cycle where fluctuations in financial risk are argued to be the key driver of capital flows and asset prices. We find that both are strongly predictive of aggregate capital inflows, with the perceptions of financial firms having a stronger effect (albeit not statistically significantly so).[27] By contrast, in Column 4, we see that it is exclusively the perception of financial firms explaining portfolio inflows. These purchases of stocks and bonds are sometimes referred to as "hot money" as they are notoriously flighty (Edison and Reinhart (2001)), and so this points to the perceptions of financial firms as being particularly critical in explaining this important component of capital flows.

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imagine using the micro data to ask what combination of firm-level perceptions best explains or predicts capital flows, or other variables of interest.

[27] We have 2,123 financial (SIC code in 6000 to 6800) and 9,752 non-financial firms in our sample.

In sum, these results 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, $CountryRisk_{c,t}$, it is a country specific variable capturing the perceptions of global firms and executives, in particular those at foreign and financial firms. In this sense, 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.

Weighted Measures of Country Risk In addition to these variations, including and excluding sets of firms from different aggregations of country risk, we also consider weighting and stratifying the sample by firm size. In Appendix Table 10, we find that variations of our measure that over-weight larger firms, for example by excluding small firms (and thus in particular small American firms that are over-represented in our sample), explain the patterns of capital flows slightly better than our baseline (unweighted measures). However, these apparent gains in precision are small and not statistically significant.

5. FIRM-LEVEL OUTCOMES

5.1. Firm-Level Investment, Employment and 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 whether increases in Country Risk coincide with declines in firm-level investment and employment. Importantly, we want to see whether Country Risk can account for firm level investment and employment decisions above and beyond the firm's perception of its own risk, $FirmRisk_{i,t}$. In Table 9, we run regressions of the form

$$y_{i,t} = \delta_i + \delta_t + \delta_c + \beta \, CountryRisk^{NHQ}_{c(i),t} + \gamma FirmRisk_{i,t} + \epsilon_{i,t} \tag{11}$$

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 δ_i, δ_c and δ_t stand for firm, country, and time fixed effects, respectively. We consider investment in Panel A and employment in Panel B.

We see $CountryRisk^{NHQ}$ enters negatively and strongly significantly, meaning that increases in foreigners' risk perceptions are associated with falls in firm-level investment and employment, even after including firm fixed effects. Column 2 additionally controls for $\mathit{FirmRisk}_{i,t}$, but nevertheless returns an almost identical coefficient of interest (-0.204, s.e.=0.022). What is striking about this result is that increases in Country Risk are associated with drops in employment and investment at firms based in the country in question *above and beyond* any risk perceptions of the firm itself. The estimate implies that a one standard deviation increase in country risk is associated with a 20.1% decrease in the firm's investment rate (and a 3.1% decrease in employment growth in Panel B).

In column 3, we split Country Risk into perceptions of foreign (NHQ) and domestic firms (HQ), while column 4 separates the perceptions of financial firms (FIN) from those of companies in the firm's own 1-digit SIC industry ($OWNIND$), excluding financial firms. Consistent with our results on capital flows above, we find that the explanatory power comes almost entirely from the perceptions of foreign firms and financial firms.

In sum, the evidence is broadly consistent with the view that variation financial firms' perceptions of a country's riskiness affect real allocations, even when holding constant the firm's perceptions of its own riskiness and the perceptions of firms in its own industry. In this sense, our findings offer support for the predictions of a broad class of models that emphasizes the role of financial intermediaries in driving real allocations. In particular, one possible explanation for the results in Tables 4 and 7-9 is that global financial intermediaries' perceptions of a country's riskiness affect capital flows and asset prices at the country-level, and thus domestic firms' cost of capital — so that this variation affects their ability to invest and hire, even if their own perception of risk remains unchanged.

5.2. *The Transmission of Foreign Risk*

Having demonstrated the importance of Country Risk as a driver of firm-level investment and employment, we now examine whether *firm-level* perceptions of risks from outside a firm's home country, Foreign Risk, also affect these firm-level decisions.

Column 1 of Table 10 adds $\mathit{ForeignRisk}_{i,t}$ as defined in equation (7) to specification (11), which already controls for Country Risk and the firm's other (not foreign-related) Firm Risk. The coefficient on Foreign Risk is negative and highly statistically significant, suggesting that specifically foreign risks lower firm-level investment, over and above the effect of other risks unrelated to foreign countries. The estimate (-0.058, s.e.=0.010) implies that a one standard deviation increase in the firm's Foreign Risk reduces its investment rate by 5.8% – an effect quantitatively similar to that of other (overall) firm risk (-0.04, s.e.=0.007). The transmission of foreign risks that we characterized in detail in Section 3 thus appears to have real effects on firm-level outcomes. In column 2, we further tighten the specification by including $Country \times Year$ fixed effects. These fixed effects fully absorb $CountryRisk^{NHQ}_{c(i),t}$, yet the coefficient estimates on Foreign Risk remain largely unchanged.

Using our measures of aggregate country risk, there are potentially other channels through which foreign risk perceptions correlate with firm level investment and employment choices. In particular, in Columns 3 and 4, we consider versions where instead of using our text-based Exposure weights in equation (8), we construct alternative measures of Foreign Risk that use firm-level accounting data to weight the various countries. In the first alternate specification, we measure exposure to a given foreign country as the share of a firm's subsidiaries based in a particular country using the 2016 data from Orbis.[28] While the sign is negative on this alternative version of Foreign Risk, it is not statistically significant when we horse-race it against our direct measure of Foreign Risk. In Column 4, we replace our exposure weights with information from the Worldscope Geographic Segment data on the country's sales share, using the share of sales (converted to USD) in a given country as the weight, with similar results.

The greater explanatory power of $ForeignRisk_{it}$ constructed using our text-based exposure measure rather than accounting measures based on subsidiaries and sales speaks to the idea that the true nature of global interconnectedness is far more complicated that can be gleaned from accounting statements alone, and it echoes our finding in Section 3 that the patterns of transmission of risks are highly dynamic and can shift significantly during during crises in ways not well-approximated by accounting data.

To put these findings in perspective, it is useful to ask how much of the variation in overall firm-risk among our sample firms can be accounted for by Foreign Risk. In particular, we

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[28] For instance, if an American firm has 4 subsidiaries, one of which is in Canada and three of which are in Mexico, the weighting $ShareOrbisLinks_{i,CAN}$=0.25 and $ShareOrbisLinks_{i,MEX}$=0.75.

project firm-level risk on Foreign Risk and the risk associated with firm i's home country

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

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. It is thus perhaps not surprising that we have the statistical power to disentangle the marginal effects of these three types of risk on firm-level outcomes.

Panel B shows strikingly similar results for firm-level employment growth, where increases in Foreign Risk are also clearly associated with decreases in hiring. The most demanding specification in column 2 implies that a one standard deviation increase in a firm's foreign risks is associated with a 0.8% decrease in hiring. As above, the employment data also show little incremental explanatory power for international risk transmission constructed using accounting data. Appendix Table 11 shows almost identical results when constructing Foreign Risk without our procedure for reducing measurement error (8).

We conclude that the dynamic transmission of risk across borders appears to have direct effects on firm-level outcomes, so that, for example, crises abroad and fluctuations of risk in foreign countries significantly affect hiring and investment at US firms, even after domestic risks are controlled for.

6. Exchange Rates and Safe Haven Currencies

In this final section, we turn to our fourth measure, Global Risk, to revisit the link between exchange rates and risk. A large literature in international macroeconomics (Meese and Rogoff (1983), Rossi (2013)) has found that currency movements in the data are largely disconnected from macroeconomic variables. 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 constructed from asset prices. This literature has shown ample evidence of a factor structure in exchange rates, with some exchange rates loading more or less on variation in these global risk factors. However, a remaining challenge is that the majority of the existing evidence is internal to asset prices, effectively explaining variation in exchange rates with risk factors that are themselves constructed from variation in asset prices. In this section, we explore the hypothesis that exchange rates fluctuate in response to changes in risk directly using our measures of country and global risk. That is, rather than using factors constructed from asset returns, we relate exchange rate movements to variation in our text-based measures of risk.[29]

We begin in Table 11 with a panel regression, examining the ability of changes in our country risk and sentiment measures to explain changes in the quarterly exchange rate against the US dollar. In column 1, we run a univariate regression (conditional on country fixed effects) of changes in exchange rates on Country Risk and find that a one log point increase in the latter is associated with a 0.13 log point depreciation of the country's currency against the dollar.[30] That is, currencies generally tend to depreciate against the US dollar when their countries become riskier. The regression in column 2 then adds the change in Global Risk. Consistent with the conventional view that the US dollar is a "safe haven" currency, we find that when Global Risk increases, all currencies tend to depreciate against the the US dollar (the base currency in this regression). Column 3 introduces year-quarter fixed effects, and Column 4 adds changes in Country Sentiment as a control, with similar results: when Country Sentiment decreases or Country Risk increases, the country's currency tends to depreciate.

Having shown the significant explanatory power of Country Risk and Sentiment for changes in exchange rates, we now return to the question of the explanatory power of heterogeneous loadings on Global Risk. In particular, we run a regression of the form

$$\Delta e_{c,t} = \alpha_c + \beta_c \cdot \Delta log(GlobalRisk_t) + \epsilon_{c,t}$$

where $\Delta e_{c,t}$ is the period-average change in the equal-weighted broad exchange rate.[31] We move from the bilateral exchange rate to a broad exchange rate to more easily see whether currencies tend to appreciate or depreciate relative to all other currencies in response to

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[29] Kalemli-Özcan and Varela (2021) examine the relationship between the failure of UIP and risk measures.

[30] We use Germany's country risk for the euro and drop data on all other euro area currencies.

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

spikes in Global Risk. Panel A of Figure 8 plots these β_c 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 8, we plot these estimated β_c coefficients on the x-axis and the R^2 of the regression on the y-axis. Currencies that are relatively more managed or even pegged during the sample period are in gray, while freely floating currencies are in green.[32] 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 as perceived by managers and investors increases. By contrast, among the floating currencies, it is only the yen, US dollar, and euro that have their broad exchange rate load positively on global risk. That is, these three "safe haven" currencies appreciate systematically when risks as perceived by global investors and executives are high.

In panels (c) and (d) of Figure 8, 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 US dollar than have currencies that either appreciate or depreciate less. We view these results as providing direct evidence 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)).

7. Conclusion

Understanding the international propagation of risks and crises is essential for policymakers concerned with sudden stops, contagion, the stability of the international financial systems,

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[32] We use the de facto exchange rate classifications from Ilzetzki et al. (2019) and classify currencies as freely floating if their average Ilzetzki et al. (2019) rating from 2003 to 2020 averages at least a 12 in their "fine" classification – that means currencies that are as flexible or more flexible than a "De facto moving band +/-5% Managed floating." We classify the Euro as floating throughout.

and the cross-border impacts of monetary and fiscal policies. A major obstacle to studying these phenomena, however, is a lack of measurement: aggregate measures of country risk are often silent as to whose perceptions of a given risk are changing, why they are changing, and how these same risks affect firms and decision makers in other countries.

In this paper, we argue that granular measurement of the risks and opportunities that managers and investors at each of thousands of listed firms around the world associate with a given foreign country at a point in time is a key step in making progress on these questions. By flexibly aggregating our firm-country-quarter-based measures we are able to disentangle local from global crises, name the sources that managers attribute these crises to, and characterize in detail the transmission of these risks to firms around the world.

We use our new measures to deliver several main insights: First, almost all large spikes of risk in our sample had a clearly attributable source, which include political crises, natural disasters, sovereign default, trade disputes, and other economic worries. Second, while the transmission of risk across borders typically follows a gravity structure, it often changes dramatically during crises. For example, sovereign debt crises and those originating in developed markets tend to have a significantly higher degree of financial transmission than natural disasters and episodes of political instability. Similarly, crises originating in emerging markets and sovereign debt crises tend to have relatively stronger bilateral transmission. Third, elevated perceptions of a country's riskiness are associated with significant falls in local asset prices, a depreciated exchange rate, capital outflows, a higher likelihood of sudden stops, and reductions in firm-level investment and employment. Fourth, the risk perceptions of foreign firms and financial firms appear particularly useful for explaining the variation in many of these variables. Fifth, we provide direct evidence of a novel type of contagion: risk transmitted from foreign countries significantly affects the investment decisions of domestic firms. Finally, we show direct evidence that heterogeneous currency loadings on perceived global risk help explain the cross-country pattern of interest rates and currency risk premia.

Beyond these immediate applications, we believe our methodology opens the door to a range of future research questions. The underlying micro data and all of our aggregate time series are posted at `country-risk.net`, allowing researchers to explore a range of questions on global risk perceptions and their consequences.

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

Ngram	$\omega(b,c)$	Frequency	Ngram	$\omega(b,c)$	Frequency
Panel A: Turkey					
Turkey/Turkish	805.22	2,738	the Undersecretariat	87.61	112
Gazette No	246.57	398	Izmir	82.21	87
Turk Eximbank	171.04	181	the Directive	76.56	135
Ankara	144.58	153	in prioritydevelopment	76.54	81
Official Gazette	131.89	495	prioritydevelopment regions	74.65	79
of Turkeys	128.48	187	in Turkeys	73.71	78
Istanbul	127.94	244	Region VI	71.18	91
the lira	114.34	121	Undersecretariat of	71.18	91
the GDFI	94.50	100	Patent Institute	70.01	113
an AS	88.63	129	the AKP	68.04	72
Panel B: Japan					
Japan	244.15	2,820	Standards Law	83.63	206
Economy Trade	215.39	466	Japanese	81.28	3,801
the JFTC	207.15	371	Tokyo	81.13	626
Health Labour	138.47	248	Antimonopoly Law	78.70	215
Industry METI	136.24	244	Labour Standards	75.78	207
the METI	115.58	207	AntiMonopoly Law	73.89	182
The JFTC	107.21	192	inhabitant tax	73.49	159
the JPO	86.55	155	Okinawa	72.03	129
the Diet	85.99	154	and Welfare	70.96	246
enterprise tax	84.58	183	Osaka	69.42	171
Panel C: Greece					
Greece/Greek	607.83	2,897	The ND	73.09	114
Athens	339.67	640	New Democracy	69.89	109
Hellenic	249.73	649	Greeks	64.75	101
ND government	130.15	203	gov gr	61.55	96
Piraeus	127.91	241	Strategic Reference	61.55	96
Share sale	88.48	138	Attica	59.63	93
an AE	80.78	126	ministerial decisions	59.20	127
Thessaloniki	80.67	152	Alpha Bank	58.34	91
by Law	79.83	511	objective value	57.70	90
the EA	76.30	119	of Development	54.90	236

Notes: This table lists the top 20 ngrams when sorted on $\omega(b,c)$ (the $tf \times idf$ in the training library) for three selected countries. Column 2 shows the $\omega(b,c)$ 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); and column 3 shows the frequency of the ngram in the country-specific library. A country-specific training library consists of (a) all adjacent two-word combinations (bigrams) from the country's Economist Intelligence Unit (EIU) Country Commerce Reports published between 2002 and 2019; and (b) all unigrams in the EIU that are also in a custom country-specific names list that consists of country names, region names, and city names of cities with more than 15,000 inhabitants in 2018 (from Geonames.org), and all adjectival demonymic forms of the country name (from Wikipedia and the CIA World Factbook). We impose that an ngram that is a country name gets assigned the highest $tf \times idf$ of all ngrams in the country library that contain the country name.

Table 2: Country Exposure and observed firm links

	$Exposure_{i,c}$ (*std.*)				
	(1)	(2)	(3)	(4)	(5)
$\mathbb{1}(Headquarter)_{i,c}$	2.337***			2.229***	2.943***
	(0.040)			(0.078)	(0.102)
$\mathbb{1}(Exports)_{i,c}$		1.225***		1.026***	1.195***
		(0.025)		(0.025)	(0.029)
$\mathbb{1}(Subsidiary)_{i,c}$			0.595***	0.262***	0.299***
			(0.008)	(0.006)	(0.007)
R^2	0.114	0.059	0.059	0.168	0.205
N	533,925	215,325	387,225	168,570	168,570
Country FE	no	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 1; summary statistics are provided in Panel A of Table 3. Column 5 includes country fixed effects. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 3: Summary statistics

PANEL A: FIRM-COUNTRY	Mean	Median	St. Dev.	Min	Max	N
$\textit{CountryExposure}_{i,c}$ *(std.)*	0.77	0.62	1.00	0.00	82.33	533,925
$\mathbb{1}(\textit{Headquarter})_{i,c}$	0.02	0.00	0.14	0.00	1.00	533,925
$\mathbb{1}(\textit{Exports})_{i,c}$	0.06	0.00	0.24	0.00	1.00	215,325
$\mathbb{1}(\textit{Subsidiaries})_{i,c}$	0.16	0.00	0.36	0.00	1.00	387,225
PANEL B: COUNTRY-QUARTER	**Mean**	**Median**	**St. Dev.**	**Min**	**Max**	**N**
$\textit{CountryRisk}^{ALL}_{c,t}$ *(std.)*	3.69	3.50	1.00	2.15	10.11	3,240
$\textit{CountryRisk}^{NHQ}_{c,t}$ *(std.)*	4.22	4.04	1.00	2.57	11.84	3,240
$\textit{CountryRisk}^{FIN}_{c,t}$ *(std.)*	3.87	3.70	1.00	2.16	11.72	3,240
$\textit{CountryRisk}^{NFC}_{c,t}$ *(std.)*	3.33	3.12	1.00	1.93	9.89	3,240
$\textit{CountrySentiment}^{ALL}_{c,t}$ *(std.)*	3.00	2.90	1.00	-0.46	7.40	3,240
$\overline{\textit{FirmRisk}_{i,c,t}}_{c,t}$ *(std.)*	3.17	3.00	1.00	0.62	12.25	2,256
$\textit{Realized MSCI volatility}_{c,t}$	10.05	8.70	6.17	1.72	115.88	2,961
$\textit{MSCI equity return}_{c,t}$	0.02	0.03	0.10	-0.86	0.62	2,958
$\textit{Total inflows}_{c,t}$ *(%)*	1.68	1.51	2.25	-16.11	18.62	2,792
$\textit{Sovereign CDS spread}_{c,t}$ (pct)	1.87	0.74	3.92	0.01	29.01	2,713
$\textit{Real GDP growth}_{c,t}$	0.93	1.05	5.89	-26.48	29.24	2,882
$\Delta \log(\textit{Spot rate}_{c,t})$	-0.01	0.00	0.13	-3.66	0.37	2,592
PANEL C: FIRM-YEAR	**Mean**	**Median**	**St. Dev.**	**Min**	**Max**	**N**
$\textit{CountryRisk}^{NHQ}_{c(i),t}$ *(std.)*	3.41	3.71	1.00	1.35	5.02	90,355
$\textit{CountryRisk}^{FIN}_{c(i),t}$ *(std.)*	4.06	4.32	1.00	1.64	5.68	90,355
$\textit{CountryRisk}^{OWNIND}_{c(i),t}$ *(std.)*	1.63	1.86	1.00	0.00	10.56	90,355
$\textit{FirmRisk}_{i,t}$ *(std.)*	1.21	0.98	1.00	0.00	18.01	93,759
$\Delta \log(\textit{employment rate}_{i,t})$	0.04	0.02	0.19	-0.71	0.75	70,963
$\log(\textit{investment rate}_{i,t})$	-1.92	-1.89	0.94	-5.04	0.52	74,999
$\textit{ForeignRisk}_{i,t}$ *(std.)*	2.80	2.63	0.78	0.00	12.72	93,759

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, $\textit{CountryExposure}_{i,c}$ *(std.)* is the average over time of firm i's Country Exposure to country c, normalized by the standard deviation; and $\mathbb{1}(\textit{Headquarter})_{i,c}$, $\mathbb{1}(\textit{Exports})_{i,c}$, $\mathbb{1}(\textit{Subsidiaries})_{i,c}$ are binary variables equal to one if firm i is headquartered in country c, reports sales to country c, or has at least one subsidiary in country c, respectively. In Panel B, $\textit{CountryRisk}^{ALL}_{c,t}$ *(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; $\textit{CountryRisk}^{NHQ}_{c,t}$ *(std.)*, $\textit{CountryRisk}^{FIN}_{c,t}$ *(std.)*, and $\textit{CountryRisk}^{NFC}_{c,t}$ *(std.)* are the same but based on firms not headquartered in c at t, financial (SIC $\in [6000, 6800)$), and non-financial (SIC $\notin [6000, 6800)$) firms respectively; $\textit{CountrySentiment}^{ALL}_{c,t}$ *(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; $\overline{\textit{FirmRisk}_{i,c,t}}_{c,t}$ *(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),normalized by the standard deviation in the panel; $\textit{Realized MSCI volatility}_{c,t}$ is the standard deviation of the daily MSCI stock return for country c during quarter t (based on local currency), $\textit{MSCI equity return}_{c,t}$ is the $t-1$ to t change in log of the quarter-average MSCI stock return index (based on local currency) for country c and quarter t; $\textit{Total inflows}_{c,t}$ *(%)* are inflows of equity and debt to country c during quarter t relative to the country's stock of capital in the previous quarter; $\textit{Sovereign CDS spread}_{c,t}$ is the end-of-quarter 5-year sovereign CDS spread of country c and quarter t (in percent); $\textit{Real GDP growth}_{c,t}$ is the quarter-to-quarter percent change in real GDP of country c and quarter t; and $\log(\textit{spot rate}_{c,t})$ is the log difference of the quarter-average bilateral exchange rate of country c with the USD for quarter t. In Panel C, $\textit{CountryRisk}^{NHQ}_{c(i),t}$ *(std.)*, $\textit{CountryRisk}^{FIN}_{c(i),t}$ *(std.)*, and $\textit{CountryRisk}^{OWNIND}_{c(i),t}$ *(std.)* are Country Risk of the country firm i is headquartered in $c(i)$ in year t as perceived by firms headquartered outside of country c, financial firms, and firms in the same industry (excluding the finance sector), respectively, each normalized by its standard deviation in the panel; $\textit{FirmRisk}_{i,t}$ *(std.)* is the number of risk words per word mentioned in any earnings call of firm i in year t; $\Delta \log(\textit{employment rate}_{i,t})$ is the year-to-year difference in the log of employment, winsorized at the first and last percentile; $\log(\textit{investment rate}_{i,t})$ 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 $\textit{ForeignRisk}_{i,t}$ (*std.*) is the sum over countries of $\textit{CountryRisk}_{i,c,t}$, normalized by its standard deviation in the firm-year panel. See also Appendix Table 7 for details on the construction of the outcome variables.

Table 4: Country Risk, Country Sentiment, and asset prices

	MSCI equity return$_{c,t}$		Δ*CDS spread*$_{c,t}$		Δ*Realized volatility*$_{c,t}$	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta\log(CountryRisk^{ALL}_{c,t}\ (std.))$	–0.399***	–0.213***	3.926***	2.768***	0.098***	0.103***
	(0.045)	(0.035)	(1.014)	(0.805)	(0.018)	(0.023)
$\Delta IHS(CountrySentiment^{ALL}_{c,t}\ (std.))$		0.267***		–1.456***		0.008
		(0.050)		(0.515)		(0.011)
R^2	0.099	0.230	0.057	0.081	0.015	0.016
N	2,918	2,918	2,626	2,626	2,917	2,917

Notes: This table shows coefficient estimates and standard errors from regressions at the country-quarter level. *IHS*($\cdot$) denotes the inverse hyperbolic sine transformation. All variables are as defined in Table 3; their construction is detailed in Appendix Table 7. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 5: Top five origins and destinations of transmission risk for selected countries

Firms headquartered in	discuss risks from	Risks originating in	transmit most to
United States	China	China	Hong Kong
	Canada		Singapore
	Mexico		Taiwan
	Japan		South Korea
	Brazil		Japan
Canada	United States	Greece	Austria
	China		Belgium
	Mexico		Italy
	Australia		Spain
	United Kingdom		France
United Kingdom	Ireland	Russia	Finland
	China		Austria
	United States		Turkey
	Australia		Denmark
	Spain		Italy
Australia	New Zealand	Brazil	Chile
	China		Luxembourg
	United Kingdom		Spain
	United States		Mexico
	Singapore		France
China	Hong Kong	Turkey	Greece
	United States		Austria
	Japan		Italy
	Taiwan		Russia
	Singapore		Netherlands
India	China	United Kingdom	Ireland
	United Kingdom		Australia
	United States		France
	Brazil		Sweden
	South Africa		Denmark
Japan	China	Argentina	Chile
	Thailand		Luxembourg
	United States		Spain
	Indonesia		Mexico
	Singapore		Brazil
Germany	China	Egypt	Greece
	Russia		Turkey
	United States		Italy
	Spain		France
	Poland		Israel
Sweden	Norway	Iran	Turkey
	China		Russia
	Russia		South Africa
	Poland		Greece
	United Kingdom		South Korea
Brazil	Argentina	Japan	South Korea
	China		Hong Kong
	Colombia		Israel
	Mexico		Singapore
	Chile		Switzerland

Notes: This table lists for ten selected countries in which firms are headquartered (column 1), the top five countries those firms discuss risks about (column 2); it also lists for ten selected countries that firms perceive risk in about (column 3), the top five countries those firms are headquartered in (column 4). The set of 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 an appropriate sorting of $\overline{TransmissionRisk_{o\to d,t}}_{o\to d} = \frac{1}{T_{o,d}} \sum_t TransmissionRisk_{o\to d,t}$ by o for a given d (column 2) or by d for a given o (column 4). $TransmissionRisk_{o\to d,t}$ is defined in Equation 6.

Table 6: Crisis transmission patterns

	Global Impact $\widehat{y}$	Bilateral Transmission $\widehat{\beta}_{o\to d,\tau}$	Regularity of Transmission R^2	Financial Transmission $\widehat{\alpha}^{FIN}_{o\to i,\tau}/\widehat{\alpha}_{o\to i,\tau}$
China: Start of Coronavirus outbreak (2020q1)	3.68	2.58***	0.905	−1.89***
United States: Lehman; start of GFC (2008q1-08q3)	2.26	0.92	0.554	1.70**
Japan: Fukushima disaster (2011q2-11q3)	2.12	1.91*	0.281	−1.06
China: US-China trade war (2018q4-19q4)	2.08	1.73***	0.924	−2.03***
China: Equity market volatility (2015q3-16q1)	1.84	1.91***	0.938	−0.94
United States: S&P downgrade (2011q3-11q4)	1.75	1.01	0.762	−0.61
United States: Deepwater Horizon oil spill (2010q2)	1.63	0.93	0.673	−1.98
China: Risk of 'hard landing' (2012q4)	1.54	1.41***	0.964	−1.68
Greece: Grexit referendum (2015q3)	1.49	2.82***	0.712	3.90***
Mexico: Trump; trade risks (2017q1)	1.44	1.45***	0.793	−1.48
Thailand: Flood disaster (2011q4-12q1)	1.40	4.00***	0.683	−0.77
Turkey: Failed coup attempt (2016q3)	1.39	1.44*	0.467	−0.67
United Kingdom: Brexit referendum (2016q3-16q4)	1.37	1.51***	0.857	0.44***
Russia: Crimean crisis (2014q2-15q4)	1.35	2.68***	0.881	−1.47*
Brazil: Corruption scandal (2015q1-16q2)	1.28	1.68***	0.915	−1.89**
Venezuela: Aftermath of oil strike (2003q1)	1.18	5.09*	0.304	−1.88
Greece: First bailout (2010q1-10q2)	1.17	2.80***	0.734	1.83***
Turkey: Currency and debt crisis (2018q4-19q1)	1.16	1.79***	0.628	1.10*
United Kingdom: Lead-up to Brexit (2019q1-20q1)	1.14	1.17**	0.855	−1.22
Thailand: Military coup (2014q3)	1.02	1.79***	0.856	−2.04
Nigeria: Oil workers' strike (2003q2)	1.01	1.95	0.380	−1.95
Russia: Economic uncertainty (2011q4)	1.00	1.42***	0.822	−1.51
Greece: Second bailout (2011q1-12q3)	1.00	3.13***	0.722	6.73***
Turkey: FX volatility (2019q4)	0.98	0.97	0.502	−2.22
Spain: Sovereign debt crisis (2011q4)	0.97	1.55***	0.906	1.24**
Ireland: Brexit (2020q1)	0.97	0.98	0.751	−1.15
Spain: Bailout (2012q3-12q4)	0.97	1.67***	0.884	0.14
Turkey: FX volatility (2016q1)	0.96	1.08	0.603	−1.28
Egypt: Egyptian revolution (2011q1-11q2)	0.92	3.49***	0.902	−0.89
Ireland: Sovereign debt crisis (2011q4)	0.90	1.10	0.874	10.85***
Hong Kong: Protests against extradition bill (2019q3-19q4)	0.85	1.49***	0.938	−0.21
Italy: Sovereign debt crisis (2011q4)	0.80	1.26***	0.894	2.32***
Iran: Green Revolution (2012q1)	0.80	1.21	0.579	−1.96

Notes: This table lists four characteristics of each local crisis defined in Figure 5: Global Impact, Bilateral Transmission, Regularity of Transmission, and Financial Transmission. The first three characteristics are based on a regression of $TransmissionRisk_{o\to d,\tau}$ on $\overline{TransmissionRisk}_{o\to d,t\notin S^c}$ as defined in Equation 9. Global Impact is the predicted value of $TransmissionRisk_{o\to d,\tau}$ for the country with the median of Transmission Risk, $\overline{TransmissionRisk_{o\to d,t\notin S^c}}^{median}$, using the estimated coefficients from the regression; Bilateral Transmission is the estimated coefficient on $\overline{TransmissionRisk}_{o\to d,t\notin S^c}$, $\widehat{\beta}_{o,\tau}$, with ***, **, and * denoting the statistical significance of $\widehat{\beta}_{o\to d,\tau}$ being different from *one*; and Regularity of Transmission is the R^2 of the regression. Financial Transmission is the ratio of $\widehat{\alpha}^{FIN}_{o\to i,\tau}/\widehat{\alpha}_{o\to i,\tau}$ from a firm-level regression of $TransmissionRisk_{o\to i(d),\tau} - \overline{TransmissionRisk}_{o\to i(d),t\notin S^c}$ on a constant, $\widehat{\alpha}_{o\to i,\tau}$, and an indicator equal to one if the firm is a financial firm, $\widehat{\alpha}^{FIN}_{o\to i,\tau}$, with ***, **, and * denoting the statistical significance of $\widehat{\alpha}^{FIN}_{o\to i,\tau}$ being different from zero.

Table 7: Country Risk, capital flows, and sudden stops

PANEL A	*Total inflows*$_{c,t}$ *(%)*				
	(1)	(2)	(3)	(4)	(5)
$\mathit{CountryRisk}^{ALL}_{c,t}$ *(std.)*		–0.759***	–0.735***	–0.647***	–0.423**
		(0.188)	(0.182)	(0.144)	(0.184)
$\mathit{GlobalRisk}_{t}$ *(std.)*	–0.485***	–0.240**	–0.244**		
	(0.082)	(0.108)	(0.112)		
Real GDP growth$_{c,t}$			–0.008	0.023**	
			(0.008)	(0.010)	
$\mathit{CountrySentiment}^{ALL}_{c,t}$ *(std.)*					0.724***
					(0.225)
R^2	0.105	0.119	0.125	0.269	0.261
N	2,792	2,792	2,657	2,657	2,792
PANEL B	$\mathbb{1}$(*Stop episode for total flows*$_{c,t}$)				
	(1)	(2)	(3)	(4)	(5)
$\mathit{CountryRisk}^{ALL}_{c,t}$ *(std.)*		0.082**	0.079**	0.086**	0.060*
		(0.037)	(0.038)	(0.034)	(0.032)
$\mathit{GlobalRisk}_{t}$ *(std.)*	0.092***	0.066***	0.067***		
	(0.009)	(0.015)	(0.015)		
Real GDP growth$_{c,t}$			–0.001	0.000	
			(0.001)	(0.001)	
$\mathit{CountrySentiment}^{ALL}_{c,t}$ *(std.)*					–0.070**
					(0.028)
R^2	0.088	0.095	0.096	0.337	0.342
N	2,734	2,734	2,627	2,627	2,734
Country FE	yes	yes	yes	yes	yes
Quarter FE	no	no	no	yes	yes

Notes: This table shows coefficient estimates and standard errors from regressions at the country-quarter level. The outcome in Panel B, $\mathbb{1}$(*Stop episode for total flows*$_{c,t}$), is a dummy equal to one if there is a stop episode for total capital flows of country c in quarter t as defined in Forbes and Warnock (2021). All other variables are defined as in Table 3. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 8: Capital flows and heterogeneous perceptions of Country Risk

PANEL A	*Total inflows*$_{c,t}$ *(%)*			
	(1)	(2)	(3)	(4)
$CountryRisk^{ALL}_{c,t}$ *(std.)*	–0.700***			
	(0.159)			
$CountryRisk^{US\ firms}_{c,t}$ *(std.)*		–0.863***		
		(0.214)		
$CountryRisk^{NHQ}_{c,t}$ *(std.)*			–0.541***	–0.518***
			(0.190)	(0.190)
$WUI_{c,t}$ *(std.)*				–0.094*
				(0.055)
R^2	0.251	0.247	0.248	0.249
N	2,792	2,792	2,792	2,792

PANEL B	*Total inflows*$_{c,t}$ *(%)*			*Portfolio*$_{c,t}$ *(%)*
	(1)	(2)	(3)	(4)
$CountryRisk^{NHQ}_{c,t}$ *(std.)*	–0.511***	–0.496***		
	(0.181)	(0.170)		
$CountryRisk^{HQ}_{c,t}$ *(std.)*	0.010			
	(0.074)			
$\overline{\text{FirmRisk}_{i,t}}_{c,t}$ *(std.)*		–0.179*		
		(0.090)		
$CountryRisk^{FIN}_{c,t}$ *(std.)*			–0.468***	–1.109**
			(0.102)	(0.424)
$CountryRisk^{NFC}_{c,t}$ *(std.)*			–0.291*	0.006
			(0.165)	(0.260)
R^2	0.275	0.332	0.254	0.134
N	2,589	2,079	2,792	2,936
Country FE	yes	yes	yes	yes
Quarter FE	yes	yes	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 3. All regressions include country and year-quarter fixed effects. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 9: Firm outcomes and heterogeneous perceptions of Country Risk

PANEL A	$\log(\textit{investment rate}_{i,t})$			
	(1)	(2)	(3)	(4)
$CountryRisk^{NHQ}_{c(i),t}$ *(std.)*	–0.207***	–0.204***	–0.205***	
	(0.022)	(0.022)	(0.022)	
$FirmRisk_{i,t}$ *(std.)*		–0.042***		
		(0.007)		
$CountryRisk^{HQ}_{c(i),t}$ *(std.)*			–0.009	
			(0.006)	
$CountryRisk^{FIN}_{c(i),t}$ *(std.)*				–0.213***
				(0.025)
$CountryRisk^{OWNIND}_{c(i),t}$ *(std.)*				–0.020
				(0.013)
R^2	0.511	0.512	0.511	0.512
N	71,673	71,673	71,673	66,735
PANEL B	$\Delta\log(\textit{employment}_{i,t})$			
	(1)	(2)	(3)	(4)
$CountryRisk^{NHQ}_{c(i),t}$ *(std.)*	–0.032***	–0.031***	–0.031***	
	(0.005)	(0.005)	(0.005)	
$FirmRisk_{i,t}$ *(std.)*		–0.009***		
		(0.001)		
$CountryRisk^{HQ}_{c(i),t}$ *(std.)*			–0.003**	
			(0.001)	
$CountryRisk^{FIN}_{c(i),t}$ *(std.)*				–0.031***
				(0.005)
$CountryRisk^{OWNIND}_{c(i),t}$ *(std.)*				0.004
				(0.004)
R^2	0.233	0.233	0.233	0.234
N	67,266	67,266	67,266	55,833
Firm FE	yes	yes	yes	yes
Year FE	yes	yes	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 3. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 10: Firm-level transmission of Foreign Risk

	All firms			
Panel A	$\log(investment\ rate_{i,t})$			
	(1)	(2)	(3)	(4)
$ForeignRisk_{i,t}$ *(std.)*	–0.058***	–0.057***	–0.059***	–0.059***
	(0.010)	(0.010)	(0.010)	(0.010)
$CountryRisk^{NHQ}_{c(i),t}$ *(std.)*	–0.205***			
	(0.022)			
$FirmRisk_{i,t}$ *(std.)*	–0.040***	–0.038***		
	(0.007)	(0.007)		
$\sum_{c\neq c(i)} Subsidiaries_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$			–0.008	
			(0.052)	
$\sum_{c\neq c(i)} Exports_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$				–0.007
				(0.018)
R^2	0.512	0.525	0.525	0.525
N	71,673	73,771	73,771	73,771
Panel B	$\Delta\log(employment_{i,t})$			
	(1)	(2)	(3)	(4)
$ForeignRisk_{i,t}$ *(std.)*	–0.009***	–0.008***	–0.008***	–0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
$CountryRisk^{NHQ}_{c(i),t}$ *(std.)*	–0.031***			
	(0.005)			
$FirmRisk_{i,t}$ *(std.)*	–0.009***	–0.008***		
	(0.001)	(0.001)		
$\sum_{c\neq c(i)} Subsidiaries_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$			–0.017	
			(0.011)	
$\sum_{c\neq c(i)} Exports_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$				–0.001
				(0.004)
R^2	0.234	0.244	0.244	0.244
N	67,266	69,509	69,509	69,509
Firm FE	yes	yes	yes	yes
Year FE	yes	n/a	n/a	n/a
Country×Year FE	no	yes	yes	yes

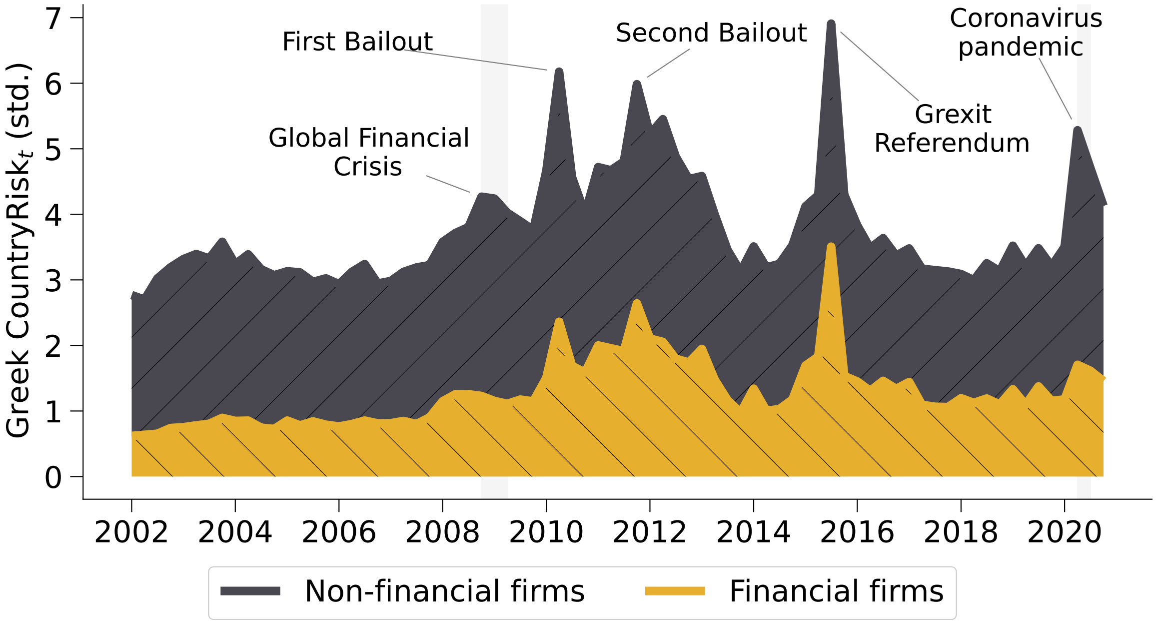
Notes: This table shows coefficient estimates and standard errors from regressions at the firm-year level. $\sum_{c\neq c(i)} Subsidiaries_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ and $\sum_{c\neq c(i)} Exports_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ are defined similarly to $ForeignRisk_{i,t} = CountryExposure_{i,c} \times \widetilde{CountryRisk}^{NHQ}_{c,t}$ but replace the first term in the sum with $Subsidiaries_{i,c}$ and $Exports_{i,c}$, respectively. $Subsidiaries_{i,c}$ is the share of subsidiaries firm i has in country c in 2016; $Exports_{i,c}$ is the average dollar amount of sales by firm i to country c between 2002 and 2016, if available. All other variables are defined as in Table 3. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Table 11: Exchange rates, Country Risk, and Global Risk

	$\Delta\log(Spot\ exchange\ rate_{c,t})$			
	(1)	(2)	(3)	(4)
$\Delta\log(CountryRisk_{c,t}$ *(std.)*	–0.131***	–0.059**	–0.059**	–0.044*
	(0.025)	(0.025)	(0.023)	(0.022)
$\Delta\log(GlobalRisk_{c,t})$		–0.270***		
		(0.056)		
ΔIHS($CountrySentiment_{c,t}$ *(std.)*				0.039*
				(0.021)
R^2	0.151	0.156	0.214	0.214
N	2,556	2,556	2,556	2,556
Country FE	yes	yes	yes	
Quarter FE	no	no	yes	

Notes: This table shows coefficient estimates and standard errors from regressions at the country-quarter level. All variables are defined as in Table 3. IHS(·) denotes the inverse hyperbolic sine transformation. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

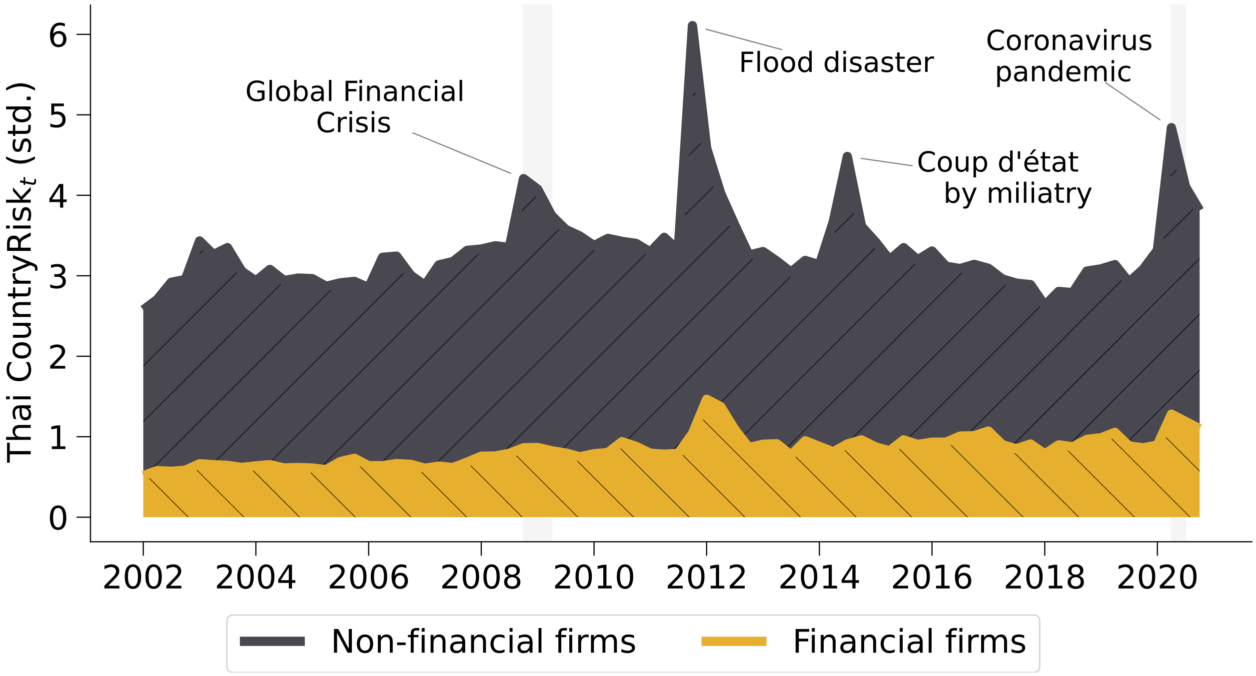
Figure 1: Sources of Greek Country Risk



Summary	Example text excerpts from high-impact snippets
First bailout (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) "[...] of exposure to banking and sovereign risk in Greece, Italy, Spain, Portugal, and Ireland combined [...]" (National Bank of Canada, May 28, 2010)
Second bailout (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) "[...] '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)
Grexit referendum (2015q3)	"[...] concern related to the possible impact of a Greek eurozone exit has led to persistent volatility in currencies [...]" (BlackRock Inc, July 15, 2015) "[...] 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)

Notes: This figure plots the time series of Greek $CountryRisk_{c,t}$ as defined in equation (5) 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. The text excerpts are selected from the highest-ranking snippets among all snippets from the top 30 highest-ranked firms when sorted on Country Risk for Greece.

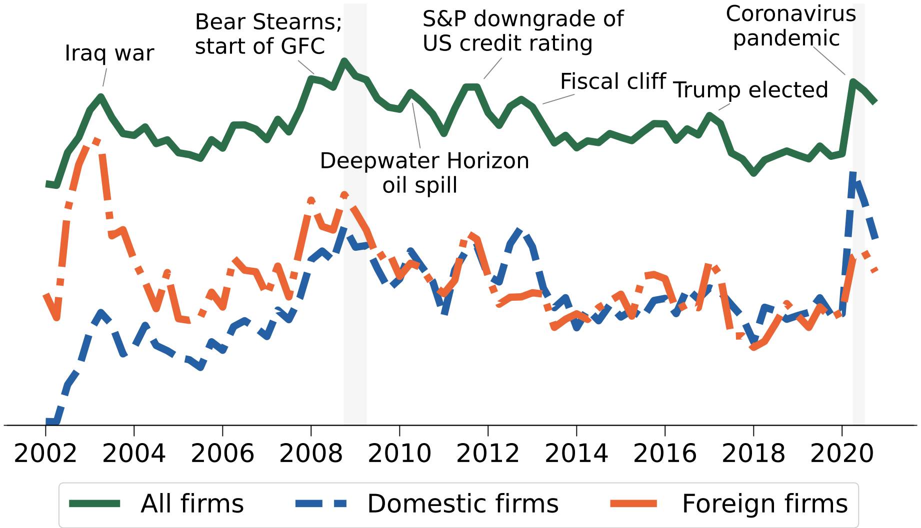
Figure 2: Sources of Thai Country Risk



Summary	Example text excerpts from high-impact snippets
Flood disaster (2011q4-12q1)	“[...] follow the disk drive industry know the ((severe)) flooding in Thailand has created substantial ((disruption)) and uncertainty for the entire hard disk [...] (Hutchinson Technology Inc; November 1, 2011) “[...] about the potential credit impacts of the unfortunate events in Thailand At Scotia Capital I can (assure) you that the variable compensation [...]” (Bank of Nova Scotia; December 2, 2011) “[...] risk of supply constraints resulting from the recent flooding in Thailand Working capital decreased by approximately million to million during the first [...] (March Networks Corp, December 9, 2011)
Military coup (2014q3)	“[...] which accounts for a major proportion of our sales In Thailand sales volume decreased due to political instability following the coup detat [...]” (Mitsubishi Motors Corp; July 30, 2014) “[...] sales and margins However JECs joint venture with Trane in Thailand was negatively affected by the political uncertainty there that has led [...]” (Jardine Matheson Holdings Ltd; August 3, 2014) “[...] the BRICs was offset by losses in other countries including Thailand which was pressured by geopolitical risk On a yeartodate basis we [...] (International Flavors & Fragrances Inc)

Notes: This figure plots the time series of Thai $CountryRisk_{c,t}$ as defined in equation (5) 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. The text excerpts are selected from the highest-ranking snippets among all snippets from the top 30 highest-ranked firms when sorted on Country Risk for Thailand.

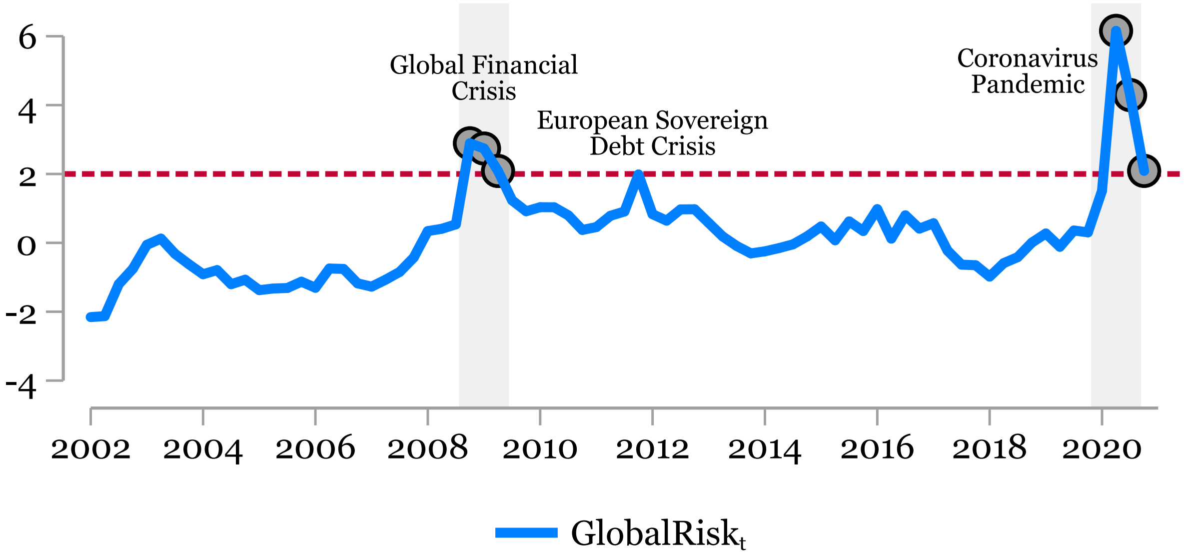
Figure 3: Sources and Perceptions of United States' Country Risk



Summary	Example text excerpts from high-impact snippets
Iraq war (2003q1)	"[...] the US and other parts of the world and related US military action overseas For further descriptions of these risks and uncertainties [...]" (Charles River Laboratories International Inc, February 4, 2003) "[...] 'experiencing in the capital markets the slower recovery in the US and the geopolitical uncertainty Turning to slide three youll see we [...]" (Bank of Montreal, February 25, 2003)
GFC (2008q1 onwards)	"[...] tightening of global credit markets The economic uncertainties in the US and the volatility in equity markets that has resulted from those [...]" (Canaccord Genuity Group Inc, February 7, 2008) "[...] uncertainties in growing economies including high oil prices inflation and US subprime financial crisis We may expect continued paucity of the market [...] (Samsung Electronics Co Lt, April 24, 2008)
S&P downgrade (2011q3)	"[...] recovering with uncertainty and instability Especially recently Standard Poors ((downgraded)) US credit rating from AAA to AA which resulted in stock market [...]" (PetroChina Co Ltd, August 25, 2011) "[...] macro uncertainty and particularly the fiscal uncertainty here in the US I was hoping you could comment on how if at all [...]" (Calamos Asset Management Inc, August 2, 2011)
Fiscal cliff (2012q4)	"[...]the US fiscal cliff and all the macros in the US coupled with EU uncertainty and coupled with maybe some growth uncertainty [...]" (Jefferies Group LLC, Dec. 18, 2012) "[...] fiscal cliff the challenges in the Eurozone the uncertainty of US tax policy and the unknown impact of the US elections all [...]" (Equity One Inc, Nov. 2, 2012)
Trump elected (2016q4)	"[...] the regulatory uncertainty around Affordable Care Act linked to the US election cycle as well as certain uncertainties around MA and enrollment [...]" (Syntel Inc, October 20, 2016) "[...] the overall state of the economic climate primarily in the US and the possibility of changing international trade policies worldwide Thank you [...]" (Collectors Universe Inc, February 2, 2017

Notes: This figure plots the time series of United States $CountryRisk_{c,t}$ as defined in equation (5), decomposed into Country Risk as perceived by all, domestic, and foreign firms, respectively. The text excerpts are selected from the highest-ranking snippets among all snippets from the top 30 highest-ranked firms when sorted on Country Risk for the United States.

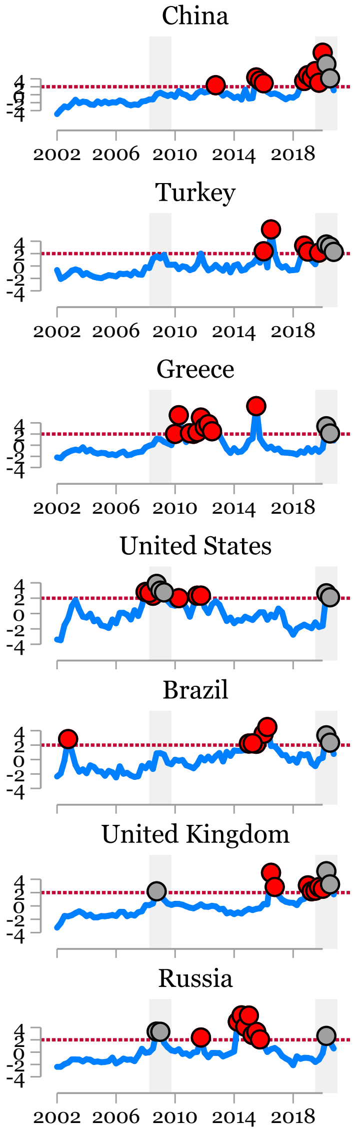
Figure 4: Time series of *GlobalRisk*$_t$



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

Figure 5: Country Risk, Crises, and Patterns of Transmission

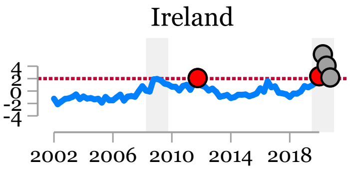
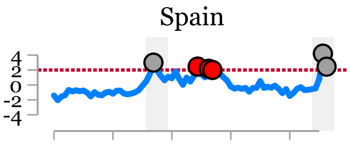
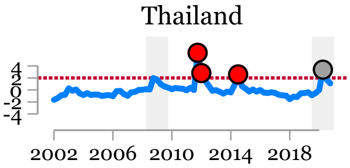
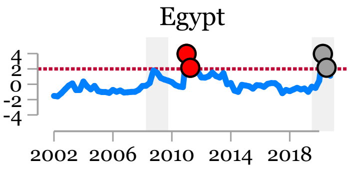
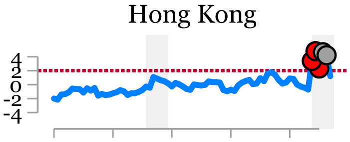
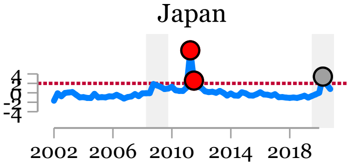
	Source	Transmission
China		
2012q4	Risk of 'hard landing'	
2015q3-16q1	Equity market volatility	
2018q4-19q4	US-China trade war	NFC
2020q1	Start of Coronavirus outbreak	NFC
Turkey		
2016q1	FX volatility	
2016q3	Failed coup attempt	I
2018q4-19q1	Currency and debt crisis	FIN
2019q4	FX volatility	I
Greece		
2010q1-10q2	Sovereign debt crisis, first bailout	FIN
2011q1-12q3	Sovereign debt crisis, second bailout	FIN
2015q3	Grexit referendum, third bailout	FIN
United States		
2008q1-08q3	Lehman, start of GFC	FIN, I
2010q2	Deepwater Horizon oil spill	
2011q3-q4	S&P downgrade	
Brazil		
2002q4	Lula election	
2015q1-16q2	Corruption scandal	NFC
Great Britain		
2016q3-q4	Brexit referendum	FIN
2019q1-20q1	Lead-up to Brexit	
Russia		
2011q4	Economic uncertainty	
2014q2-15q4	Crimean crisis	NFC



● Global crisis
● Local crisis

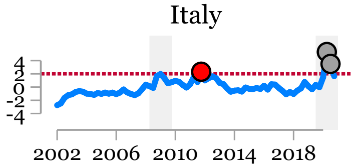
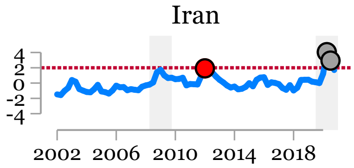
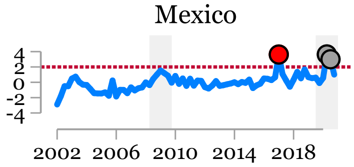
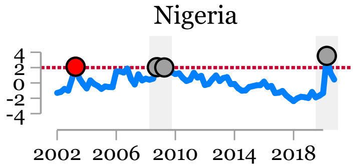
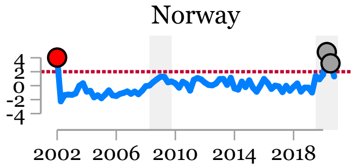
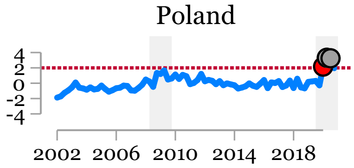
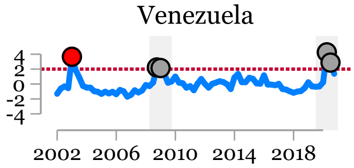
Notes: This table describes and plots country crises based on $CountryRisk_{c,t}$ for the country indicated in column 1. A global crisis (gray dots in the figures) is defined as $GlobalRisk_t$ being above two standard deviations (see also Figure 4); a local crisis (red dots in the figures) is defined as the country's $CountryRisk_{c,t}$ being above two standard deviations in the panel (the red horizontal dashed line). Column 1 indicates the country and crisis. For Brazil, we assume that 2015q4, which is just below the threshold of two standard deviations, is nevertheless part of the crisis that started in 2015q1. Column 2 indicates the Source of crises. It is a description summarizing discussions of top 30 highest-ranked firms when sorted on Country Risk in that quarter. Column 3 indicates the Transmission of crises: I is based on column 3 of Table 6 and indicates that the Regularity of Transmission is in the lowest quartile; NFC and FIN are based on column 4 of Table 6 and indicate a statistically significant difference in the transmission of risk from o to d for non-financial and financials, respectively.

Figure 5: Country Risk, Crises, and Patterns of Transmission (continued)

Where and when	Source	Transmission	
Ireland			
2011q4	Sovereign debt crisis	FIN	
2020q1	Brexit		
Spain			
2011q4	Sovereign debt crisis	FIN	
2012q3-12q4	Sovereign debt crisis and bailout		
Thailand			
2011q4-12q1	Flood disaster		
2014q3	Military coup		
Egypt			
2011q1-11q2	Egyptian revolution		
Hong Kong			
2019q3-20q1	Protests against extradition bill		
Japan			
2011q2-q3	Fukushima disaster	I	

● Global crisis
● Local crisis

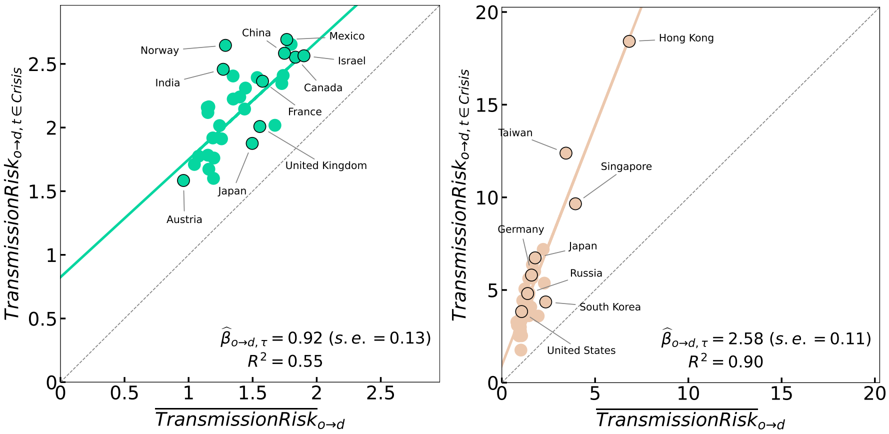
Figure 5: Country Risk, Crises, and Patterns of Transmission (continued)

Where and when	Source	Transmission	
Italy			
2011q4	European sovereign debt crisis	FIN	
Iran			
2012q1	Green Revolution	I	
Mexico			
2017q1	Trump; trade risks		
Nigeria			
2003q2	Oil workers' strike	I	
Norway			
2002q1	Cooccurrence of local concerns		
Poland			
2020q1	Coocurrence of local concerns		
Venezuela			
2003q1	Aftermath of oil strike	NFC, I	

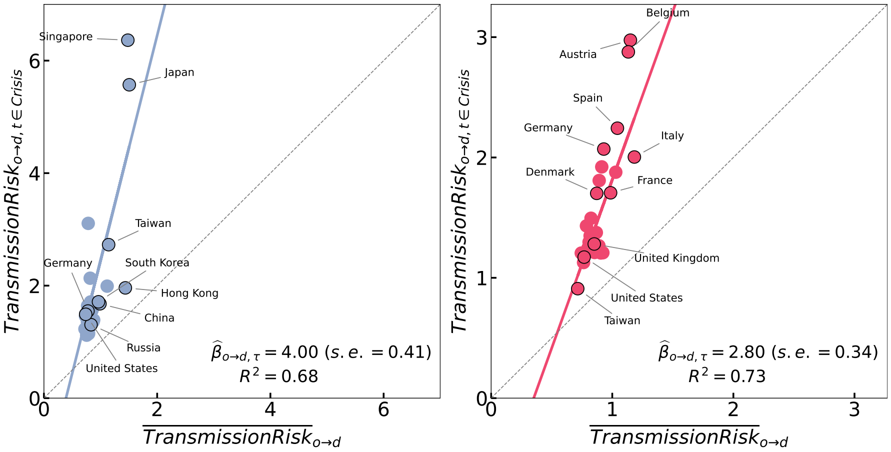
● Global crisis
● Local crisis

Figure 6: Patterns of Transmission during Major Crises

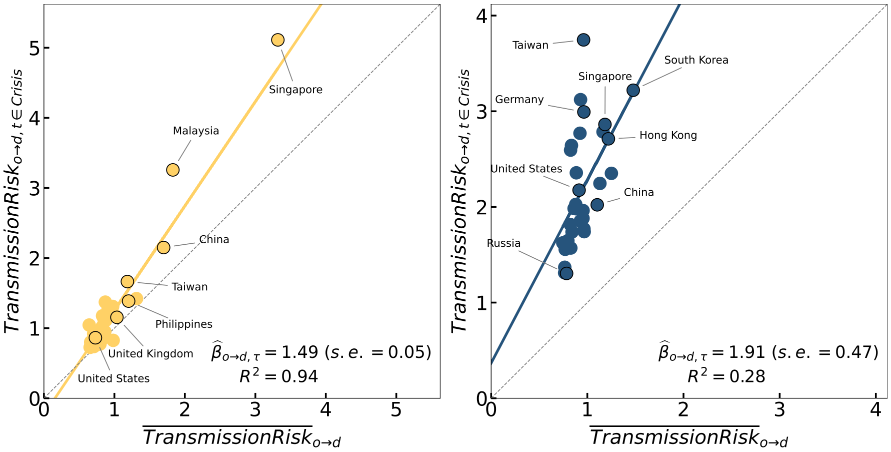
(a) Start of GFC, USA (2008q1-q3) (b) Start of Covid, China (2020q1)



(c) Thai Floods (2011q4-12q1) (d) First bailout, Greece (2010q1-q2)

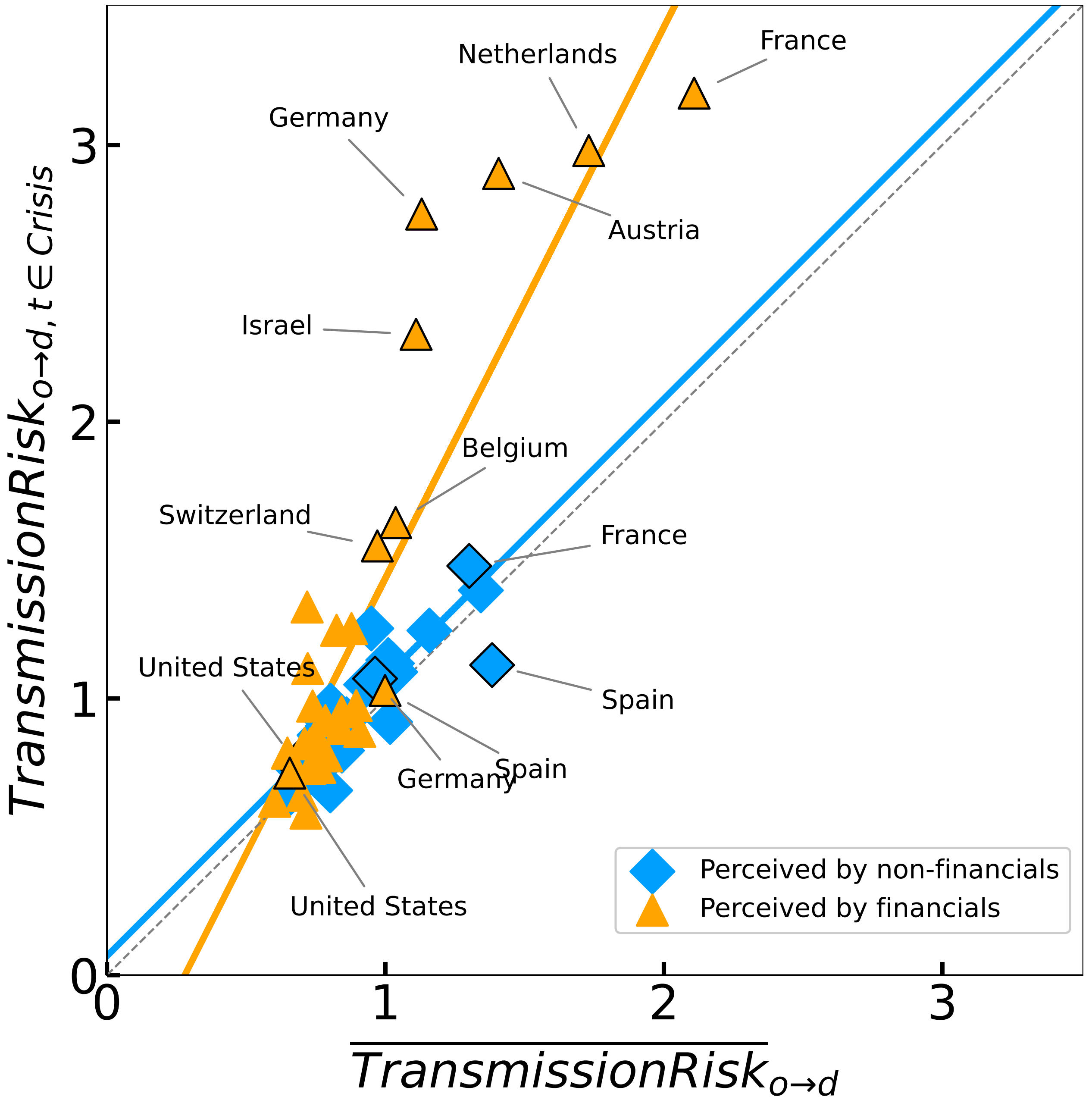


(e) Hong Kong protests (2019q3-19q4) (f) Fukushima (2011q2-q3)



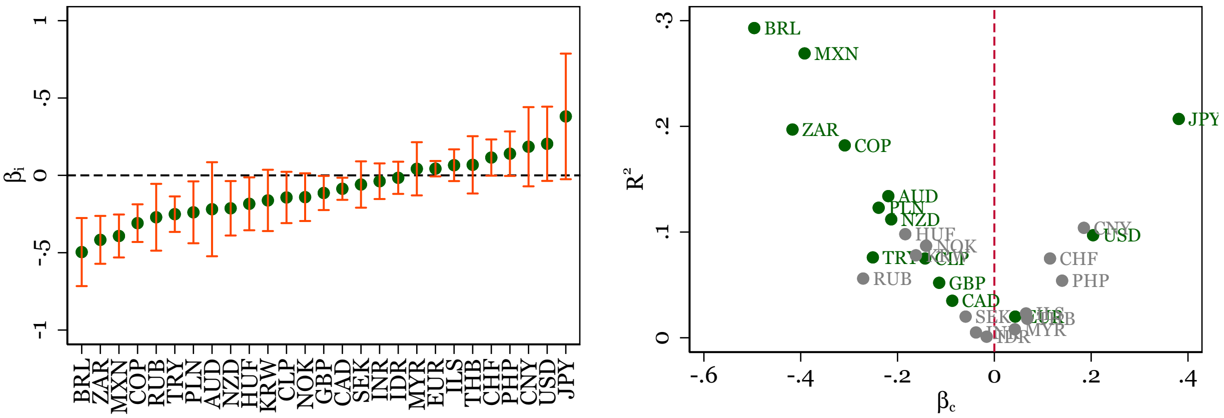
Notes: This figure plots for six different crises, each in one panel, $TransmissionRisk_{o\to d,\tau}$ against $\overline{TransmissionRisk}_{o\to d,t\notin S^c}$, the fitted regression line from a linear regression as defined in Equation 9, and the 45 degree line (in gray). The crises are selected from Table 6 and the fitted regression line corresponds to the regression on which the values reported in that table are based on.

Figure 7: Italy: European sovereign debt crisis (2011q4)



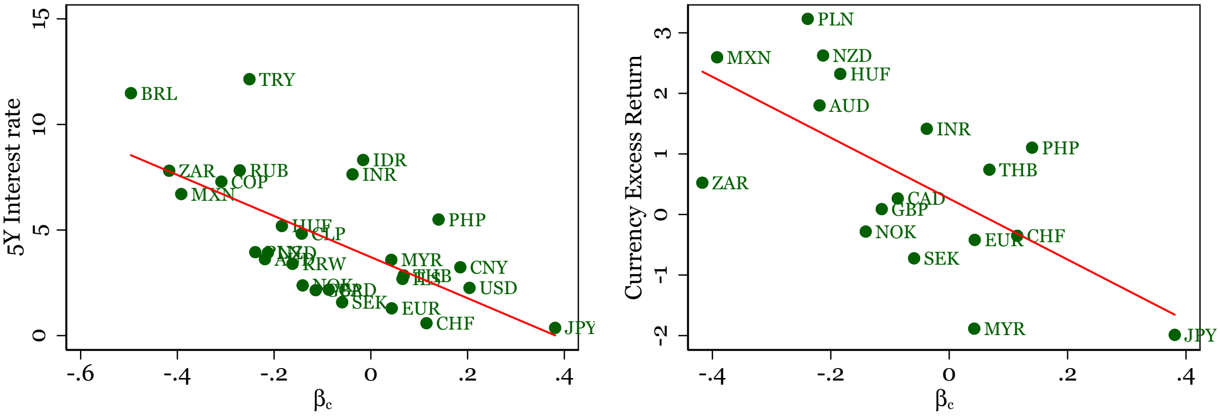
Notes: This figure plots for two set of firms, financials and non-financials, $TransmissionRisk_{o \to d, \tau}$ against $\overline{TransmissionRisk}_{o \to d, t \notin S^c}$, the fitted regression line from a linear regression as defined in Equation 9, and the 45 degree line (in gray). The crisis is selected from Table 6.

Figure 8: Exchange Rates and Global Risk



(a) Estimated Betas

(b) R^2 and β



(c) β and the Cross-Section of Interest Rates

(d) β and the Cross-Section of Excess Returns

Notes: This figure plots the coefficient β_i for regressions of the form

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

against a number of variables. Panel (a) reports the point estimates and (robust) 95% confidence interval. Panel (b) plots the point estimates of β_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 β_i against the average 5-year government nominal interest rates from Du et al. (2018). Panel (d) plots the β_i against the average excess return against the USD from Hassan and Zhang (2020).