

The Price of Forbearance*

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Abstract

Regulatory forbearance is a fiscal transfer. Insolvent borrowers survive only as long as the government can afford to stand behind the banks that carry their loans, so their equity should load on the sovereign's capacity to backstop its banking system. I show that this exposure is priced. In Japan, an intermediary leverage factor prices portfolios of zombie firms but not the broad cross-section. Decomposing it, what prices zombies is the sovereign risk component of intermediary risk, while the orthogonal component prices bank-dependent firms that are not necessarily zombies. After the November 1997 failures that tested the government's backstop, zombies underperformed other firms. When support is direct rather than intermediated, the same exposure is priced without banks. I show that a U.S. sovereign risk factor prices portfolios of federal government suppliers, which underperformed after the 2011 downgrade.

JEL Codes: G12, G21, G28, H63

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1 Introduction

When regulators allow banks to roll over loans to insolvent borrowers rather than recognize the losses, the government implicitly commits to absorb the losses if the banks cannot. Forbearance is therefore a fiscal transfer, and the borrowers kept alive this way—zombie firms—rely on the government’s budget capacity to stand behind the banks that carry their loans. I show that this dependence is priced. Zombies’ expected returns compensate for the risk that a budget-constrained government stops supporting forbearance. The same dependence of firms on the government exists where government support is direct rather than intermediated: in the U.S., government suppliers rely on the government’s budget capacity through commercial sales. In both cases, when the government’s budget constraint grows more binding, government-dependent firms’ returns decrease compared to their less government-dependent peers’ returns, and firms with greater sovereign risk exposure have higher expected returns to compensate for bearing sovereign risk.

Beginning in the 1990s, Japanese banks restructured loans to insolvent borrowers—zombie firms—to avoid recognizing non-performing loans and their associated capital write-down (Peek and Rosengren, 2005; Caballero et al., 2008). Following Caballero et al. (2008), I identify zombies as firms that borrow at below-market rates. Banks rolled over loans many times in an environment of regulatory forbearance and implicit government support, and zombies had large effects on productivity and competition (Hayashi and Prescott, 2002; Caballero et al., 2008). Zombies rely on banks to continue evergreening their loans, and banks rely on the government to continue allowing forbearance.

The fiscal nature of forbearance became explicit after 2020. Japan’s pandemic-era business support was through government-affiliated lenders and through private-bank loans that were publicly guaranteed and interest-subsidized, and Hoshi et al. (2023) find that firms with low pre-pandemic credit scores were the most likely to apply for and receive these subsidies and concessional loans. The pandemic programs put the government’s budget behind weak borrowers directly, compared to evergreening in the 1990s that provided support through banks. In both cases the continued support depends on the government’s capacity to pay for it.

I construct intermediary and sovereign risk factors. The Japanese intermediary factor is constructed using shocks to intermediary leverage and reflects the constraints of intermediaries,

and I proxy for government constraints using a sovereign risk factor, *GovFac*, constructed from sovereign credit-default swap (CDS) spreads, which reflect the market’s expectation of default (Chernov et al., 2020). The sovereign risk factor proxies for the shadow price of the government’s budget constraint, and it reflects the risk that a transfer of taxpayer wealth to a government-dependent firm does not occur. Suppose the need for such a transfer arises: if the government carries a higher default risk, then the associated higher CDS spread reflects a higher financing cost of government interventions, and politicians may be less willing to act. Such wealth transfers can occur in many flavors, including capital injections, emergency loans, lax regulatory oversight, or purchase orders, but ultimately, transfers require government resources. The government must have the budget capacity to execute the transfer.

Japanese zombies are exposed to sovereign risk through the intermediary sector. I show that the intermediary factor prices zombie firms sorted into 25 size-and-book-to-market portfolios but does not price non-zombie portfolios or Japanese Fama–French portfolios. I decompose the intermediary factor into two components: a part driven by sovereign risk and a part orthogonal to sovereign risk. The component of intermediary risk correlated with sovereign risk drives the intermediary pricing of zombies, and the orthogonal component does not price zombie portfolios. Non-zombies are not dependent on the government and are not priced by either component. Zombies also have a 30% higher beta to sovereign risk than non-zombies in daily returns, and the difference disappears when I control for bank returns, consistent with zombies’ indirect dependence on the government. The price of forbearance is the sovereign risk component of intermediary risk. A one standard deviation increase in a zombie portfolio’s beta to the sovereign risk component corresponds to a 1.9 percentage point increase in its annualized risk premium.

Zombie firms are not just bank-dependent firms. Zombies have greater government dependence, and this difference is reflected in asset pricing tests. I classify firms as bank-dependent using three measures: external finance dependence, bank beta, and the absence of a long-term issuer rating. I form bank-dependent portfolios, and I show that the overall intermediary factor also prices bank-dependent portfolios, but the component of intermediary risk that is unrelated to sovereign risk drives the result.

Banks and the government are closely linked. Unlike virtually all other industries, banks are widely believed to have recourse to the government purse in bad states, due to the negative externalities of bank failures and financial instability. In Japan, banks also hold

large positions in government bonds, and bank returns covary with sovereign CDS (Acharya et al., 2014; Gennaioli et al., 2014). The link between banks and the government is the mechanism through which zombies depend on the government, and the comparison with bank-dependent firms separates zombies’ government dependence from a high bank beta. If zombies were only high-bank-beta firms, then the sovereign risk component of intermediary risk would also price bank-dependent portfolios, and it does not.

Zombies also have substantial negative abnormal returns around salient financial events. In November 1997, four Japanese financial institutions failed, and the interbank market seized until the Finance Minister and the Governor of the Bank of Japan reaffirmed their commitment to the banking system. After each of the four failures, zombies earned lower cumulative abnormal returns than non-zombies.

Sovereign risk exposure exists outside of Japan and can take different forms. In the U.S., government suppliers rely on the government through commercial sales. Government suppliers rely on the government to translate taxpayer funding into purchase orders, and a budget-constrained government may cut orders. I classify firms with at least 10% of sales to the U.S. government as government suppliers; suppliers span many industries, including defense contractors like Raytheon and Northrop Grumman, but also Aetna, Con Edison, and Walgreens. I show that a U.S. sovereign risk factor prices monthly size-and-book-to-market portfolios of government suppliers and that the market, size, and value factors do not span the sovereign risk factor. A one standard deviation increase in a portfolio’s beta corresponds to a 4.8 percentage point increase in the annualized risk premium. The sovereign risk factor does not price the Fama–French portfolios, which have no heterogeneity in sovereign risk exposure. Government suppliers have greater sovereign risk exposure than non-suppliers, and their betas increase with their government sales ratios. Firms with sales to the federal government are most likely to be affected by government belt-tightening, and I show that government suppliers face lower abnormal returns than non-suppliers after the 2011 U.S. sovereign debt downgrade.

Parajuli (2023) shows that firms with higher government sales dependency have higher returns and attributes the premium to mispricing. My results are consistent with a risk-based explanation: government suppliers’ returns covary with sovereign risk, suppliers with greater government dependence have higher betas, and suppliers have lower returns than other firms when the government becomes more constrained.

Government support in the U.S. stems from sales rather than credit because U.S. banks do not evergreen loans (Favara et al., 2024). Banks’ dependence on the government is not unique to Japan: international banks with a higher probability of government support, measured by Fitch bank support ratings, have greater domestic sovereign risk exposure. In Appendix C, I also show that large U.S. banks and auto companies have higher betas to sovereign risk after bailout announcements. These results overlap with existing work on government guarantees (Kelly et al., 2016a; Gandhi et al., 2020; Berndt et al., 2025).

Section 2 presents the framework. Section 3 describes the data and factor construction. Section 4 presents the Japanese results. Section 5 presents the U.S. results for government suppliers and the international evidence on bank support ratings. Section 6 concludes.

Related Literature

This paper connects to four literatures: zombie lending, intermediary asset pricing, implicit government guarantees and sovereign risk, and the asset pricing of firms’ government dependence.

Zombie lending and forbearance. Zombie lending has been studied most closely in Japan, where the lost decade of the 1990s turned into two lost decades of low productivity growth (Hayashi and Prescott, 2002; Hoshi and Kashyap, 2004). Peek and Rosengren (2005) show that troubled firms were more likely to receive bank credit, and Caballero et al. (2008) show that zombies congested their industries and depressed the investment and employment of healthy firms. Bank recapitalizations that were too small encouraged evergreening rather than new lending (Giannetti and Simonov, 2013). Zombies have since spread across advanced economies (Adalet McGowan et al., 2018; Banerjee and Hofmann, 2022), and in Europe weakly capitalized banks kept lending to weak firms, with costs for competitors, productivity, and inflation (Acharya et al., 2019; Schivardi et al., 2022; Blattner et al., 2023; Bonfim et al., 2023; Acharya et al., 2024). Hu and Varas (2021) show that zombie lending can arise in equilibrium in a lending relationship, Bruche and Llobet (2014) study how regulators can deter it, and Acharya et al. (2021) show that it can trap monetary policy in prolonged accommodation.

Hoshi et al. (2023) show that Japan’s COVID-19 support—concessional loan programs of at least 3 percent of GDP—was more likely to reach firms with low pre-pandemic credit

scores. Forbearance is ultimately fiscal, and I treat the support zombies receive as a claim on the government’s budget. Although alternative definitions of zombies add profitability screens (Fukuda and Nakamura, 2011; Banerjee and Hofmann, 2022), Acharya et al. (2022) find that only interest-rate-subsidy definitions detect spillovers onto healthy firms, which supports the interest-rate-gap measure of Caballero et al. (2008) that I use. Favara et al. (2024) show that U.S. banks do not lend to zombies, and Faria-e Castro et al. (2024) find evergreening only by lenders with a concentrated share of a firm’s debt. In the United States, government support therefore reaches firms directly rather than through bank forbearance, which is why the U.S. sections study government suppliers, and why I study forbearance in Japan, where it is best documented. These papers study the causes and real effects of forbearance, while I study how forbearance is priced. Zombies’ expected returns compensate for the risk that the government stops condoning forbearance, and Ross (2025) shows that zombies also depress momentum returns in Japan.

Intermediary asset pricing. When intermediaries’ balance-sheet capacity declines and funding constraints bind, intermediaries have a high marginal utility of wealth, and assets that do not pay off in those states must offer higher expected returns (Brunnermeier and Pedersen, 2009; He and Krishnamurthy, 2012, 2013; Brunnermeier and Sannikov, 2014). Shocks to broker-dealer leverage (Adrian et al., 2014) and to primary dealers’ capital ratios (He et al., 2017) price many asset classes, and intermediary health matters most for assets that households are least willing to hold (Haddad and Muir, 2021). I build Japanese versions of the Adrian et al. (2014) and He et al. (2017) factors and add two results. First, within Japanese equities, the intermediary factor prices only firms that depend on banks, which parallels the cross-asset-class finding in Haddad and Muir (2021). Second, under forbearance, the intermediary factor is partly a sovereign risk factor: its component correlated with sovereign CDS innovations prices zombies, while the orthogonal component prices ordinary bank-dependent firms.

Government guarantees and sovereign risk. Implicit guarantees are valuable to bank shareholders (O’Hara and Shaw, 1990; Gandhi and Lustig, 2015; Kelly et al., 2016a), more so where the government is fiscally stronger (Gandhi et al., 2020), and less so since the crisis (Berndt et al., 2025). Bank and sovereign credit risk also move together. Bailouts in 2008

raised sovereign CDS spreads (Acharya et al., 2014), sovereign downgrades lower the stock prices of banks expected to receive government support (Correa et al., 2014), and sovereign distress weakens domestic banks (Gennaioli et al., 2014; Farhi and Tirole, 2018).

Forbearance depends on the same fiscal capacity. Regulators can let banks carry non-performing loans if the government can recapitalize the banks, as Japan’s government did with capital injections in 1998 and 1999 (Hoshi and Kashyap, 2010; Giannetti and Simonov, 2013). When the government’s capacity is in doubt, so is banks’ forbearance, and where banks forbear, intermediary risk should load on sovereign risk. I measure the government’s capacity with innovations in sovereign CDS spreads, which price sovereign default risk (Pan and Singleton, 2008), reflect fiscal default risk for the United States (Chernov et al., 2020), and rose more during the pandemic for governments with less fiscal space (Augustin et al., 2022). Much of their variation is common across countries (Longstaff et al., 2011), so I test whether the factor is spanned by standard factors and whether it prices portfolios that should not be exposed to the government. I show that the value of government support to a firm, whether a guarantee or forbearance, depends on the government’s fiscal capacity.

Government dependence and expected returns. The U.S. results show that sovereign risk is also priced when dependence is direct. Parajuli (2023) shows that dependence on government sales predicts higher returns and attributes the premium to the profitability of government contracts and to mispricing rather than to risk. I find the same premium and show that it lines up with portfolios’ betas to the sovereign risk factor and that suppliers underperform when the government becomes more constrained, which points to risk, and to the same risk that prices Japanese zombies. Belo et al. (2013) show that exposure to government spending is priced conditional on the president’s party, Cohen and Malloy (2016) show that government-dependent firms invest less, and Dhaliwal et al. (2016) find that concentration in government customers lowers a supplier’s cost of equity because the government is a safer customer than a private firm. My results show that there is a limit to that safety: when sovereign CDS spreads indicate a tighter budget constraint, government suppliers underperform. The sovereign risk factor differs from measures of political and policy uncertainty (Pastor and Veronesi, 2013; Kelly et al., 2016b; Baker et al., 2016; Hassan et al., 2019). These measures capture uncertainty about the government’s actions, while sovereign CDS spreads focus on whether the government has the capacity to pay for it.

2 Conceptual Framework

Zombies rely on banks to evergreen their loans, and banks rely on government permission to forbear. I use a three-date framework to distinguish this dependence from ordinary firms' need for bank credit and to connect both to expected returns. Equity trades at date 0. At date 1, uncertainty is resolved, the government decides whether to permit forbearance, and banks decide whether to renew loans. Firms pay at date 2. I normalize discounting from date 1 to date 2 to one, and all expectations condition on date-0 information.

Forbearance and fiscal capacity. I consider a continuum of impaired borrowers. Keeping borrower i operating avoids disruption worth H_i to the government but commits it to an expected fiscal cost $c_i > 0$ in present value, over and above the cost of prompt resolution. The government weighs these benefits against other public spending. Let ψ denote the shadow value of public funds and $S_i \in \{0, 1\}$ indicate permission to forbear. The government grants permission when $H_i \geq c_i \psi$. A fall in fiscal resources raises ψ and makes the government more selective about which loans receive permission.

I define $G = \mathbb{E}[\psi] - \psi$, so positive G means greater government capacity. Disruption values are uncertain at date 0, observed by the government at date 1, and independent across borrowers and of aggregate news. With uniformly distributed disruption values and interior thresholds, the permission probability is

$$q_i(G) \equiv \Pr(S_i = 1 \mid G) = \bar{q}_i + \kappa_i G, \quad \kappa_i > 0, \quad (1)$$

where $\bar{q}_i$ is the average permission probability. Appendix A gives the government's allocation problem and the derivation.

Firm exposure. Forbearance allows banks to postpone write-downs on impaired loans (Peek and Rosengren, 2005). I focus on loans that banks are willing and able to renew whenever permission is granted and choose to resolve otherwise. Zombie equity pays $X_i^Z = V_i S_i$, where $V_i > 0$ is fixed, so government permission for forbearance determines continuation.

Let B denote mean-zero news about private bank capacity, independent of G . I write

firms' conditional payoffs as

$$\mathbb{E}[X_i | G, B] = \bar{X}_i(1 + \chi_i G + \delta_i B), \quad \bar{X}_i = \mathbb{E}[X_i] > 0. \quad (2)$$

The coefficients measure cash-flow exposure relative to the firm's average payoff. For a zombie, $\bar{X}_i = V_i \bar{q}_i$, $\chi_i = \kappa_i / \bar{q}_i > 0$, and $\delta_i = 0$. A firm exposed only through ordinary bank lending has $\chi_i = 0$ and $\delta_i \geq 0$: greater bank capacity supports profitable investment. I assume that forbearance on existing impaired loans does not expand capacity for new lending. For a government supplier, I set $\chi_i = \xi s_i$, where s_i is its government sales ratio and $\xi > 0$ translates that ratio into cash-flow exposure. I set $\delta_i = 0$ to isolate government sales.

Intermediary pricing. Following He et al. (2017), I assume intermediaries are the marginal investors. Their effective capital is $K = \bar{K} + a_G G + a_B B$, with $a_G \neq 0$ and $a_B > 0$. A CRRA continuation value gives a pricing kernel m that declines with K , normalized so that $\mathbb{E}[m] = 1/R_f$, where R_f is the gross risk-free return. The appendix states the kernel and regularity conditions.

Let $P_i = \mathbb{E}[m X_i]$ and $R_i = X_i / P_i$. For $j \in \{G, B\}$, define $\beta_{ij} = \text{Cov}(R_i, j) / \text{Var}(j)$ and $\lambda_j = -\text{Cov}(m, j) / \mathbb{E}[m]$. Expected excess returns satisfy

$$\mathbb{E}[R_i] - R_f = \beta_{iG} \lambda_G + \beta_{iB} \lambda_B. \quad (3)$$

This relation is exact for (2). The appendix derives prices, betas, and their comparative statics. The risk prices are common across firms, while exposures differ.

In the empirical tests, *GovFac* proxies for G and the intermediary factor for $K - \bar{K}$. Projecting the intermediary factor on *GovFac* is the empirical counterpart of splitting $K - \bar{K}$ into $a_G G$ and $a_B B$.

Prediction 1: The sovereign risk component prices zombies. A zombie's beta to G rises with $\kappa_i / \bar{q}_i$: the more its renewal depends on the government's budget, the more its return moves with fiscal news. Differences in expected returns across zombies are differences in this beta, so the sovereign component of intermediary risk prices zombies. Bank capacity does not enter a zombie's payoff, so the orthogonal component does not price zombies.

Prediction 2: Ordinary bank dependence is a different exposure. A firm that depends on banks only for ordinary credit has $\chi_i = 0$ and $\delta_i \geq 0$. Its beta to B rises with δ_i , and the component of intermediary risk orthogonal to sovereign risk prices it. Bank-dependent portfolios in the data contain some zombies, so they can carry both exposures.

Prediction 3: Zombies underperform when the government’s constraint tightens. Bad fiscal news lowers the probability that the government permits forbearance and lowers expected zombie payoffs. After bad news about the government’s capacity, zombies have lower returns than non-zombies. The response is due to banks’ renewal decisions and does not depend on the sign of λ_G .

Prediction 4: Government suppliers face sovereign risk directly. A supplier’s beta to G rises with its government sales ratio s_i . Suppliers with more government sales have lower returns after bad fiscal news and higher expected returns when $\lambda_G > 0$. The sovereign price of risk can differ across countries.

Section 4 tests the predictions in Japan: Predictions 1 and 2 by pricing zombie and bank-dependent portfolios with the intermediary factor and its two components, and Prediction 3 using zombies’ sovereign betas and the November 1997 bank failures. Section 5 tests Prediction 4 using U.S. government suppliers.

3 Data

U.S. Data I use CRSP return data and Compustat annual financial statement data. I follow Fama and French (1992) to merge the return data and accounting data. In this way, I match accounting data in calendar year $t - 1$ with return data for July t to June $t + 1$ to give a 6-month minimum gap between the fiscal year-end and the return data.

I use the Compustat Segments dataset to calculate a firm’s government sales ratio—the percent of sales to the U.S. government—on an annual basis. Firms are required to report operating segments that represent more than 10% of revenues and customers that make up more than 10% of total reported sales in their financial reports under Statements of Financial Accounting Standards (SFAS) 131.¹ Firms classify customers as one of seven customer

¹Before 1997, Financial Accounting Standards Board (FASB) No. 14 required firms to report the data.

types: company, geographic region, market, state government, local government, domestic government, or foreign government. I calculate the government sales ratio as the sales to the U.S. domestic government as a fraction of total sales for each company and year.² The Compustat Segments data began in 1976.

Japanese Data I use Japanese market data and accounting data from Datastream and Worldscope. The data cover 1979 to 2018 and consist of the universe of Japanese stocks in Datastream and Worldscope. I restrict my sample to companies with a book value in the previous six months and at least 12 months of return history, and I exclude financials (including REITs) and stocks that have a share price less than \$1 at the start of each month. I follow Asness et al. (2013) and restrict the data to a sample of liquid stocks. Each month, I sort stocks by market capitalization in descending order. Starting with the largest market capitalization stock, I include all stocks until the cumulative market capitalization is 90% of the total market capitalization for that month.

Identifying Zombies I identify zombies following Caballero et al. (2008): I compare a firm’s actual interest payment, $R_{i,t}$, to an estimated lower-bound $R_{i,t}^*$. The lower-bound stands for the interest payments a firm i could expect if it borrowed at no spread to the prime rate at time t :

$$R_{i,t}^* = r_{t-1}^s S_{i,t-1} + \left(\frac{1}{5} \sum_{j=1}^5 r_{t-j}^\ell \right) L_{i,t-1} \quad (4)$$

where $S_{i,t}$ is short-term debt and $L_{i,t}$ is long-term debt, and r_t^s and r_t^ℓ are the Bank of Japan’s short-term and average long-term prime rates, which reflect the prime lending rate at which principal banks lend.

I construct the interest-rate gap, $X_{i,t}$, as the difference between the actual interest payment and the lower bound, scaled by the total debt:

$$X_{i,t} \equiv \frac{R_{i,t} - R_{i,t}^*}{B_{i,t-1}} = r_{i,t} - r_{i,t}^*. \quad (5)$$

²I exclude sales labeled as sales to the domestic government but have a customer name linked to foreign domestic governments and agencies (e.g. “Brazilian Air Force” or “Canadian Government”).

In principle, only the highest-quality companies should borrow at effective rates near the prime rate, and most corporate borrowers would expect to borrow at a nontrivial spread to the prime rate. Following Caballero et al. (2008), I define companies with an interest-rate gap below 0 as *crisp* zombies, and companies borrowing near the prime rate—those with an interest-rate gap of 0 to 50 bps—as *fuzzy* zombies. I lag the interest-rate gap by six months to match the accounting data lag and ensure the balance sheet data are in the investors’ information set.

Zombie-ness is persistent: switches from zombie to non-zombie or vice versa occur roughly 1.5% of the time. The interest-rate gap is uncorrelated with firm size. Before removing small and illiquid stocks to restrict the sample to a liquid sample, size has a correlation of -0.1% with the interest-rate gap, a correlation of 4.8% with an indicator for crisp zombie, and a correlation of 3.8% with an indicator for crisp or fuzzy zombie. Cleaning the dataset to the liquid set of stocks increases the share of zombies from 20% to 48%.

Sovereign Risk Factors I derive my measure of sovereign risk using the sovereign credit-default swap (CDS) spread. A CDS swaps credit risk of the reference entity, which can be either a private entity or a sovereign. Investors that buy sovereign CDS buy insurance from credit events such as a missed coupon payment, a default, or a debt restructuring. The CDS spread reflects the market’s expectation of default, and issuers with higher CDS spreads face higher financing costs. All else equal, governments with higher CDS spreads will face higher financing costs should the sovereign turn to markets to finance an intervention.

I construct each country’s sovereign risk factor using innovations to the sovereign CDS spread from an AR(1) regression:

$$SovereignCDS_t = \rho_0 + \rho_1 SovereignCDS_{t-1} + u_t. \quad (6)$$

I convert the innovation into a growth rate by dividing by the lagged CDS spread

$$GovFac_t = -1 \times \frac{u_t}{SovereignCDS_{t-1}}, \quad (7)$$

and I multiply by -1 so that $GovFac_t$ decreases when the government is constrained. The U.S. factor is $GovFac$, and the Japanese factor is $GovFac_{JP}$. I create the factor following a method analogous to He et al. (2017). As expected, the U.S. sovereign risk factor is correlated

with news-implied and financial-statement-implied measures of government risk from other papers. See Appendix B for details.

The CDS data are from Markit and begin in 2002, with U.S. sovereign CDS data are available starting in 2003. Since the too big to fail event occurred in 1984, I form a synthetic U.S. sovereign CDS spread using the par-equivalent CDS spread approach, an industry standard and described in Beinstein and Scott (2006). See Appendix B for details. I use innovations to the synthetic U.S. sovereign CDS spread and Equations 6 and 7 to create the synthetic U.S. sovereign risk factor, $GovFac_{synthetic}$.

Intermediary Risk Factors in Japan I construct Japanese versions of the two quarterly intermediary factors in Adrian et al. (2014) and He et al. (2017). Adrian et al. (2014) use shocks to intermediary leverage to construct the risk factor $LevFac$. I use the balance sheet data of financial dealers and brokers to form the Japanese leverage factor, $LevFac_{JP}$. The data come from Japan’s Flow of Funds and begin in 1998.

He et al. (2017) use innovations to intermediary capital ratios to form a risk factor, which I will call $CapFac$. I construct the Japanese capital ratio factor, $CapFac_{JP}$, from members of the “Japanese Government Bond Market Special Participants Scheme.” The program began in October 2004 and mirrors the U.S. primary dealer system. I manually map the members to holding companies following He et al. (2017)’s approach. I use book debt and market equity data from Datastream to construct the intermediary capital ratio.

4 Zombies and Sovereign Risk in Japan

In Japan, zombies rely on the government through the intermediary sector. Zombies depend on banks to continue evergreening their loans, and zombies depend on the government to continue allowing forbearance. The government faces a budget constraint and can allocate only so many resources toward forbearance or subsidized credit. I study Japan given the existing work that documents the country’s unique zombie history—in this context, Japan is the extreme example, but I expect similar effects anywhere the government condones zombies.

Figure 1 shows widespread zombies in Japan: in recent years, nearly half of my sample is considered a zombie.³ I show that zombies’ government dependence through the intermediary

³The fraction of zombie firms in my dataset is similar to the percent from Caballero et al. (2008), which uses Nikkei Needs data.

sector is reflected in their pricing.

This section tests Predictions 1 and 2. In the model, a zombie’s payoff depends on whether the government permits its loan to be renewed, so zombie expected returns should vary with exposure to the component of intermediary risk that moves with sovereign risk. I find that Japanese intermediary risk factors price zombie portfolios and that this component drives the result.

Zombies are not just bank-dependent firms. Zombies differ from bank-dependent companies in their government dependence: zombies are both bank dependent and government dependent. Prediction 2 states that viable borrowers financed at the private-credit margin are priced by the component of intermediary risk orthogonal to sovereign news. To test the difference between bank dependence and government dependence, I test if the bank-dependent portfolios are priced by the intermediary factor and its components. Bank-dependent portfolios are priced by intermediary risk (like zombies) because they are priced by the orthogonal component (unlike zombies). These results, combined with the zombie portfolios’ pricing results, show that the difference between bank dependence and government dependence is reflected in pricing.

Figure 2 summarizes the asset pricing results for zombie and bank-dependent portfolios. The intermediary factor prices both, but for distinct reasons. Zombies rely on the government through the intermediary sector; the sovereign risk component of intermediary risk prices zombie portfolios because zombies’ expected returns reflect the riskiness of whether assets will pay off in bad states as determined by the tightness of the government’s constraints. Bank-dependent firms are not differentially affected by the government’s capacity, and they face intermediary risk unrelated to sovereign risk.

4.1 Cross-Sectional Regressions

I split my sample of Japanese companies into two buckets, zombies and non-zombies. For each bucket, I construct 25 size-and-book-to-market portfolios. The portfolios are quarterly to match the intermediary factor’s frequency and are value-weighted. I form portfolios using 98% of the market capitalization (rather than 90%). Using 90% of the market capitalization gives similar price of risk results, but the number of observations is occasionally considerably lower. I calculate the price of risk for a risk factor using the portfolio returns and a two-step procedure. First, I estimate each portfolio i ’s beta to the risk factor using time-series

regressions of each portfolio's excess return on the factor:

$$R_{i,t}^e = \alpha_i + \beta'_{i,f} \mathbf{f}_t + \varepsilon_{i,t}, \quad i = 1, \dots, N, \quad t = 1, \dots, T, \quad (8)$$

where $\mathbf{f}_t$ is a vector of risk factors. Then I run a cross-sectional regression of portfolio excess returns on the betas estimated in Equation 8:

$$\mathbb{E}[R_{i,t}^e] = \lambda_0 + \hat{\beta}'_{i,f} \lambda_f + \xi_i, \quad i = 1, \dots, N. \quad (9)$$

Using $\mathbf{f}_t = LevFac_{JP,t}$ gives the intermediary factor's price of risk, λ_{LevFac} .

Prediction 1 says that the intermediary factor should price zombie portfolios. Table 1 shows the price of risk from cross-sectional regressions using a single factor model. The intermediary leverage factor, $LevFac_{JP}$, explains the cross-section variation of zombie portfolios but does not price non-zombies or Fama–French portfolios. The results are robust to using the capital ratio factor instead of the leverage ratio factor, adding a market factor, and including the ten momentum portfolios. Unlike the U.S., the Japanese leverage and capital factors are negatively correlated, and they have opposite price of risk signs. I discuss the signs in detail in Appendix D.

I use the intermediary leverage factor to calculate the predicted returns for zombie and non-zombie portfolios, and I plot the realized returns against the predicted returns in Figure 3. For zombie portfolios, predicted and realized returns line up near the 45-degree line. For non-zombies, the predicted returns cluster in a small range, while realized returns spread over a broader range, reflecting the failure of the intermediary factor to price non-zombie portfolios.

The cross-sectional results show that zombie returns are differentially affected by banks' ability to take on leverage. Bad times for banks are worse for some zombies. As described in Adrian et al. (2014), the intermediary stochastic discount factor (SDF) is a negative function of the leverage factor. Times of low leverage—when banks are lending less per yen of equity—correspond to times of high marginal utility for intermediaries and low returns for the riskiest firms. To compensate for low returns in bad times, these zombies have high expected returns. Other zombies have strong returns in bad times, so they serve as a good hedge and have lower expected returns. For non-zombies, the covariance of returns with the intermediary SDF is not informative for expected returns.

In the model, zombies differ in how sensitive their renewal probability is to fiscal news (χ_i in Equation 2), and a zombie whose continuation commits more fiscal resources has a larger sovereign beta (Appendix Equation A.7).

Zombies' dependence on the government manifests through the intermediary sector. Under forbearance, Japanese intermediary risk and sovereign risk are correlated. Japanese broker-dealer leverage and sovereign CDS are 66% correlated in level terms, and their log changes have a 44% correlation. In the model, this is the case $a_G \neq 0$: fiscal news moves intermediaries' capital, so the intermediary factor has a component that moves with sovereign risk. I show that the correlation between intermediary risk and sovereign risk leads to the zombie intermediary asset pricing result.

I split the intermediary factor into two parts: a component correlated with the sovereign risk factor, $LevFac_{predicted}$, and an orthogonal component, $LevFac_{residual}$. I regress the Japanese intermediary factor on the Japanese sovereign risk factor:

$$LevFac_{JP,t} = \underbrace{\alpha + \beta GovFac_{JP,t}}_{LevFac_{predicted,t}} + \underbrace{\varepsilon_t}_{LevFac_{residual,t}} \quad (10)$$

$LevFac_{predicted}$ is the predicted dependent variable. $LevFac_{residual}$ is the regression residual. I use the two components of $LevFac_{JP}$ to price portfolios following the two-step procedure in Equations 8 and 9 and $\mathbf{f} = LevFac_{predicted}$ and $\mathbf{f} = LevFac_{residual}$, separately, to calculate the prices of risk.

Table 1 shows that $LevFac_{predicted}$ prices zombie portfolios with a positive price of risk, while the orthogonal component, $LevFac_{residual}$, does not explain the cross-sectional variation of zombie returns. In a horse race between the two components, the predicted component has the larger t -statistic (Table A.2, Panel C). The sovereign risk component is also priced in the Fama–French portfolios (column 8), consistent with sovereign risk being priced in Japanese equities generally. What distinguishes zombies is that the intermediary factor itself prices them but not the Fama–French portfolios (column 1 versus column 7), and that its pricing power comes from the sovereign component. Non-zombies, which do not rely on the government's budget capacity in the same way, are priced by neither the intermediary factor nor either of its components (columns 4–6). Section 4.2 shows that zombies also carry a 30% larger sovereign beta than non-zombies in daily returns, a difference that disappears once bank returns are controlled for. Zombie portfolios are differentially exposed to the risk that

the government stops supporting forbearance, and that exposure is why intermediary risk prices them.

The results are robust to using the capital ratio factor instead of the leverage factor to separate the two components, adding a market factor, and including the ten momentum portfolios.⁴

Zombies vs. Bank-Dependent Firms Zombies differ from bank-dependent firms in their government dependence. Like zombies, bank-dependent portfolios are priced by intermediary risk. Unlike zombies, the component of intermediary risk that is orthogonal to sovereign risk drives the pricing result.

I identify bank-dependent firms using three measures: external-finance dependence, bank beta, and the absence of a long-term issuer rating. First, I construct a measure for external-finance dependence in the spirit of Rajan and Zingales (1998), which represents the amount of a firm’s desired investment that it cannot finance through internal cash flows alone. I use Datastream/Worldscope data on capex and cash flows from operations to construct firms’ external-finance dependence, which is the ratio of capital expenditures less cash flows from operations to capex. To calculate the time-series of external-finance dependence for each firm, I calculate the external-finance ratio using data as available in the previous ten years. Second, I measure bank betas using each firm’s bank beta using 24 to 60 months of monthly returns, as available, in the five years before July of year t , like the Fama–French pre-ranking betas. Third, Kashyap et al. (1994) define bank-dependent firms as companies *without* a long-term issuer rating from S&P since these firms do not have easy access to capital markets. I apply the same definition using long-term issuer ratings from Japan Credit Rating Agency, Ltd.: a firm is bank dependent if it has no JCR rating.

For each measure separately, I classify a firm as bank dependent if it is above the median of external-finance dependence, above the median of bank beta, or has no long-term issuer rating. I form bank-dependent portfolios annually in June t for July t to June $t + 1$, using accounting data available in December $t - 1$. Zombie-ness and bank dependence are related; each of the three bank dependence measures has a significant correlation with the zombie indicator ranging from 9% to 12%, and zombies are more bank dependent than non-zombies using each measure.

⁴See Table A.1, Table A.2, and Table A.3.

For each measure of bank dependence, I form 35 quarterly portfolios of bank-dependent firms—25 sorted on size and book-to-market and 10 sorted on momentum, following the test assets in Adrian et al. (2014)—and I price the portfolios using the intermediary factor and its components. I use the two components of $LevFac_{JP}$ to price portfolios following the two-step procedure in Equations 8 and 9 and $\mathbf{f} = LevFac_{predicted}$ and $\mathbf{f} = LevFac_{residual}$, separately, to calculate the prices of risk.

Table 2 and Figure 4 show the cross-sectional pricing results. Bank-dependent portfolios are priced by the intermediary factor and the intermediary component orthogonal to sovereign risk, $LevFac_{residual}$. Bank-dependent portfolios are not priced by the component correlated with sovereign risk, $LevFac_{predicted}$. The results are similar using the capital ratio factor in place of the leverage factor and adding a market factor.⁵ The intermediary factors price zombie portfolios and bank-dependent portfolios but do not price Japanese Fama–French portfolios since they do not sort in a way that gives heterogeneous exposure to intermediary beta. Sorting on bank dependence first gives portfolios an economically meaningful spread in intermediary beta.

4.2 Japanese Event Studies

Prediction 3 states that a deterioration in fiscal capacity lowers zombies’ renewal probabilities and thus the continuation value of zombie equity. Relative to otherwise similar firms, zombies should have higher sovereign betas and lower returns when news makes the government’s backstop less reliable. I test both implications.

I show that Japanese zombies have a higher beta to sovereign risk than non-zombies and that zombies have lower cumulative abnormal returns than non-zombies after a shock to the banking system.

Table 3 shows the regression of daily returns on the sovereign risk factor in Japan. Zombies have a 30% larger beta to sovereign risk than non-zombies. Zombies’ government dependence is indirect: zombies exist because banks forbear on their non-performing loans, and they rely on the government to continue allowing banks to do so. Consistent with the indirect mechanism, zombies have a higher beta to sovereign risk than non-zombies, but the effect disappears when I control for bank returns.

The bank-return control is a test of the channel. In the model, bank returns and zombie

⁵See Table A.4, Table A.5, and Table A.6.

cash flows both move with the government’s permission to renew loans (Equation 1), so if zombies’ sovereign exposure comes from their banks, controlling for bank returns should absorb it.

The November 1997 failures test the reliability of bank support even without a fiscal shock. In the model, zombie value depends on the expected probability of renewal, and a shock that makes banks less able to carry impaired loans lowers that probability. Zombies also have substantial negative abnormal returns around these events. I compare cumulative abnormal returns of zombies and non-zombies in November 1997, the beginning of the “acute phase” of Japan’s lost two decades and a period associated with tighter credit (Hoshi and Kashyap, 2010). During the month, four financial institutions unexpectedly failed. Like all panics, the panics after the failures in November 1997 were abrupt and unexpected (Nakaso, 2001).

On November 3, Sanyo Securities, a mid-sized brokerage firm with \$25 billion in assets, filed for bankruptcy. The event immediately disrupted the domestic interbank market, in which Sanyo Securities was a borrower, and they defaulted on ¥8.3 billion of unsecured funding. Although the amount was small compared to the market’s turnover, it was the first loan default in Japan’s interbank market history, and this paralyzed the interbank market (Nakaso, 2001). The spread between the 3-month Eurodollar Tokyo Interbank Borrowing Rate and Libor spiked. Two weeks later, Japan’s tenth largest bank failed, and on November 24, Yamaichi Securities, one of Japan’s four major securities dealers, abruptly failed (Nakaso, 2001). Two days later, Tokuyo City Bank failed, and market participants began to speculate about the collapse of other regional banks. Many viewed November 26 as the day Japan’s financial system was closest to a systemic collapse (Nakaso, 2001). Ultimately, the panic abated after the Finance Minister and the Governor of the Bank of Japan issued a joint statement that reaffirmed their “strong will to fulfill the commitment to ensure the stability of interbank transactions as well as to fully protect deposits.”

I study cumulative abnormal returns compared to a CAPM model. I use daily data up to November 2, 1997, the day before Sanyo Securities failed, and regress the return of each firm i on the market return:

$$R_{i,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t}) + \varepsilon_{i,t}. \quad (11)$$

I use the estimated coefficients to calculate each firm’s predicted return, $\hat{R}_{i,t}$, and I calculate the abnormal return, $AR_{i,t}$, as the difference between the realized and predicted return:

$$AR_{i,t} = R_{i,t} - \hat{R}_{i,t}. \quad (12)$$

I calculate each stock’s cumulative abnormal return starting from November 3, 1997. I sort firms into five equal groups using the interest-rate gap, and I calculate the value-weighted cumulative abnormal return for the zombie and non-zombie groups. Figure 5 shows the cumulative abnormal returns for zombie and non-zombie firms over November 1997. After each of the four events, the zombies earned lower cumulative abnormal returns than non-zombies.

The result is similar when sorting firms based on industry, a related but distinct measure of zombie-ness. Caballero et al. (2008) find that the manufacturing industry has a lower incidence of zombies compared to construction, real estate, wholesale and retail, and services industries, likely because the manufacturing industry faces more global competition than other industries. Thus, a firm’s industry is a measure of zombie-ness separate from the balance sheet data used to calculate the interest-rate gap.

Figure 5 compares the cumulative abnormal return of manufacturing firms and companies that are not manufacturing. Datastream does not classify firms into similar industry groups so I hand-classify the manufacturing and non-manufacturing groups. The left panel shows value-weighted cumulative abnormal returns for two groups: manufacturing companies and companies in the construction, retailer, and services industries, which leaves some firms unclassified. In the right panel, I classify the remaining firms. I match the group based on which industry descriptor best fits—for example, I place “Media Agencies” into the non-manufacturing group. Both methods show that non-manufacturing firms saw large negative cumulative abnormal returns over November 1997 while manufacturing firms’ returns align with market returns.

5 Direct Government Dependence

Government dependence outside of Japan can be direct rather than intermediated. Prediction 4 states that the fiscal channel does not require a bank. A supplier whose cash flows depend on government purchases has sovereign exposure that increases in its government sales share (Equation A.8), and, when the country’s fiscal risk price is positive, its expected return also

increases in the share.

In the U.S., government suppliers have a commercial sales relationship with the government, and they rely on the government to translate taxpayer dollars into purchase orders. If a budget-constrained government cuts orders, then suppliers' cash flows fall, and suppliers' returns should covary with sovereign risk. I show the relationship between sovereign risk and government suppliers' returns using cross-sectional asset pricing tests, an event study, and international evidence on bank support ratings. Large U.S. banks and auto companies are government dependent through implicit guarantees rather than sales; Appendix C shows that their sovereign risk exposure increased after the 1984 too-big-to-fail announcement and the 2008 auto bailout.

5.1 U.S. Cross-Sectional Regressions

This subsection tests the pricing part of Prediction 4, that suppliers with greater sovereign exposure earn higher expected returns. Section 5.2 tests the exposure part.

I show that the U.S. sovereign risk factor, $GovFac$, explains the cross-section of expected returns for portfolios of U.S. government suppliers. I form 25 monthly portfolios of government suppliers, double-sorted on size and book-to-market. Government suppliers are firms with at least 10% of their annual sales to the U.S. government, and Section 5.2 describes the classification. All portfolio returns are value-weighted. I calculate the price of risk using the two-step procedure in Equations 8 and 9 with $\mathbf{f}_t = GovFac_t$, which gives the sovereign risk factor's price of risk, λ_{GovFac} .

Table 4 shows the prices of risk from the cross-sectional regressions and GMM t -statistics. Columns 4 to 6 show that the sovereign risk factor prices the cross-section of portfolios formed from government suppliers. The risk factor earns a positive and significant price of risk, and a one standard deviation increase in beta corresponds to a 4.8PP increase in risk premium. This is the U.S. fiscal risk price, λ_G . The GRS p -value from the time-series regressions is large, consistent with failing to reject the model. The results are robust to adding the market, size, and value factors to the model. Including these factors increases the time-series R^2 and lowers the mean average pricing error.

Columns 1 to 3 pool the supplier portfolios with six portfolios of the largest 50 U.S. banks and six portfolios of U.S. automakers, the government-dependent firms studied in Appendix C, and impose the same price of risk across them. I restrict the portfolios to those with data

for 80% of the full period. The sovereign risk factor commands a positive and significant price of risk for the pooled portfolios. The coefficient of 0.41 means that a portfolio with $\beta_{GovFac} = 1$ carries an expected return of 0.41% per month. Increasing the portfolio's β_{GovFac} by one standard deviation increases the annualized expected risk premium by 3.7 percentage points (PP), so the risk compensation for *GovFac* is economically large. Columns 2 and 3 show similar results with the market, size, and value factors included.

In the last four columns, I use the traditional Fama–French 25 size-and-book-to-market portfolios. *GovFac* is not a compensated source of risk for the Fama–French portfolios. The results show that the standard 25 portfolios are sorted in a way that yields no heterogeneity in sovereign risk exposures across the portfolios. In column 9, the size and value factors do not price the Fama–French portfolios because the regression is constrained to months where *GovFac* is available. Column 10 shows that value has a positive price of risk using data that starts in July 1926.

While Table 4 uses estimated betas, I can instead run two separate firm-level cross-sectional regressions using the government supplier characteristic. First, I test expected returns on an indicator of whether a company is a government supplier:

$$\mathbb{E}[R_{i,t}^e] = \gamma_0 + \gamma_1 \mathbb{I}(\text{Government Supplier}) + \xi_i. \quad (13)$$

Second, I test expected returns on the government sales ratio, which measures the intensity of a firm's government dependence:

$$\mathbb{E}[R_{i,t}^e] = \gamma_0 + \gamma_1 (\text{Government Sales Ratio}) + \xi_i. \quad (14)$$

Table 5 shows the results from the two characteristic-based cross-sectional regressions. In the cross-section, government suppliers have higher returns than non-suppliers, and the intensity of government dependence corresponds to higher returns. The first two columns test the indicator setup and find that government suppliers' returns are 0.20PP higher on average per month than non-government suppliers. Since this test looks across all firms, rather than testing within suppliers, the large and significant intercept shows that non-suppliers also have positive returns. The last two columns use the intensity of the government sales ratio instead of the indicator and find a similar result. Controlling for firm size and book-to-market does not materially change the results.

Table 6 shows that other factors do not span the sovereign risk factor, meaning the other factors do not contain *GovFac*’s economic content. The U.S. sovereign risk factor is also not spanned on a daily or quarterly level. In the first column, I regress *GovFac* on the standard Fama–French factors and find that the sovereign risk factor is weakly correlated with the market and *HML*, but neither is significant. Notably, *GovFac* is not spanned by any of the factors, as shown by its large and significant intercept.

The combined results show that firms exposed to sovereign risk earn compensation for the risk of lower returns when the government becomes constrained. But sovereign risk exposure matters only for a subset of firms: returns of non-government-dependent firms are less dependent on the government’s constraints, and the factor does not describe the cross-section of Fama–French portfolios. The price of sovereign risk is a country-level quantity. In the model, it depends on how fiscal news moves intermediary capital, and it does not have to match in the U.S. and Japan. Prediction 4 is that exposure increases in government dependence, and that returns follow exposure when the price is positive.

5.2 Government Suppliers’ Sovereign Risk Exposure

Prediction 4 implies that sovereign exposure increases in government dependence ($\partial\beta_{iG}/\partial s_i > 0$ in Appendix Equation A.8) and that adverse fiscal news lowers supplier values. I test both implications. First, I show that government suppliers’ realized returns have higher beta to the U.S. sovereign risk factor than non-suppliers’ returns. Second, I use an event study to show that when the government’s budget constraint grows more binding, government suppliers have lower returns: after the 2011 U.S. sovereign debt downgrade, government suppliers had lower returns than non-suppliers.

I systematically measure a firm’s government dependence by its sales to the U.S. government. I calculate each firm’s annual government sales ratio as the percent of sales to the U.S. government. I consider firms with an annual government sales ratio of at least 10% to be government suppliers. I define firms with no government sales reported or a government sales ratio of less than 10% as non-suppliers. Specifically, if a company discloses no government sales, then the federal government accounts for less than 10% of that firm’s sales that year. Table 7 shows examples of firms in each group. Prominent government suppliers span many industries; unsurprisingly, defense contractors like Raytheon and Northrop Grumman have high government sales ratios, but less obvious examples include Aetna, Con Edison,

Corrections Corporation of America, and Walgreens. Non-suppliers span many industries as well: Amazon, Coca-Cola, Microsoft, and Walmart. In other words, sorting on government suppliers is not just a defense industry effect.

I show that government suppliers have greater sovereign risk exposure than non-suppliers. Consistent with Prediction 4, the government sales ratio covaries with beta to the U.S. sovereign risk factor. First, I calculate daily value-weighted portfolios for suppliers and non-suppliers and regress the portfolios' returns on the sovereign risk factor. Table 8 column 1 shows that a portfolio that is long government suppliers and short non-suppliers significantly covaries with innovations to sovereign risk, as predicted. Columns 2 and 3 show the long and short legs separately: while both significantly covary with sovereign risk, the beta for government suppliers is thirty times larger than the beta for non-suppliers. The covariance of the non-suppliers portfolio with sovereign risk isn't surprising: my definition of non-suppliers likely mixes some companies that have government sales rates just below the 10% disclosure threshold with companies that have a 0% ratio. Even if I had perfect insight into companies with no commercial relationship with the government, there are likely second-order effects—such as suppliers of suppliers—that have links to suppliers, so it's not clear the non-suppliers portfolio should have zero covariance with sovereign risk.

Figure 6 presents a binned scatterplot of beta to the sovereign risk factor against the average government sales ratio for each industry. The corresponding regression has a positive coefficient, showing that industries with higher government sales ratios also have greater sovereign risk exposure, the comparative static in Prediction 4.

U.S. Sovereign Debt Downgrade When sovereign risk increases, government-dependent firms' returns should reflect that increased risk. I compare the returns of government suppliers and non-suppliers after the U.S. sovereign debt downgrade on August 5, 2011, when the S&P cut their rating for U.S. sovereign debt. S&P cut the credit rating after political disagreement surrounding the debt ceiling increase in July 2011 and a budget deal passed in early August that the S&P felt “falls short of what, in our view, would be necessary to stabilize the government's medium-term debt dynamics.” The rating was cut one notch, from “AAA” to “AA+ with a negative outlook,” in the first-ever downgrade to the U.S. government's long-term credit rating. The ratings-cut dominated headlines, and markets responded immediately: the ratings-cut announcement came after markets closed on Friday,

and the S&P 500 dropped 6.7% on Monday.

I study cumulative abnormal returns compared to a CAPM model, using Equations 11 and 12 with daily data before August 5, 2011, to estimate each firm’s market beta, predicted return, and abnormal return. Figure 7 plots the cumulative abnormal return for government suppliers and non-suppliers in the week after the downgrade. On August 8—the first trading session after the downgrade—government suppliers and non-suppliers both had large negative abnormal returns. But government suppliers faced a significantly larger drop, and their cumulative abnormal returns were lower over the next week, consistent with my hypothesis that government-dependent firms have greater exposure to sovereign risk.

5.3 Bank Support Ratings and Sovereign Risk

Dependence on government support is not unique to Japan or the U.S. Internationally, bank returns rely—often implicitly—on government support. Governments are motivated to avoid bank failures because financial instability has large negative externalities, and bank returns depend on the government’s capacity to support banks if bailouts are needed. Correa et al. (2014) show that sovereign rating downgrades lower the stock prices of banks expected to receive government support. I show that a higher likelihood of external support, measured by Fitch bank support ratings, corresponds to greater dependence of banks’ returns on their home country’s sovereign risk factor.

An issuer’s credit rating measures the borrower’s creditworthiness—its capacity to repay its financial obligations. But for banks specifically, rating agencies regularly publish two different ratings: one that reflects the bank’s creditworthiness *with* government support, and one *without* government support. The existence of such ratings reinforces the close connection between banks and the government.

I examine Fitch’s bank support ratings as of 2020.⁶ Fitch Ratings’ support rating assessed the likelihood that a bank receives external support—that is, government assistance—if it runs into significant financial difficulties. The support rating puts a minimum bound on the long-term rating, and the support rating ranges from 1 to 5. A bank with an “extremely high probability of external support” has a support rating of 1, and a bank with “a possibility of external support, but it cannot be relied upon” has a support rating of 5. The support

⁶Fitch withdrew support ratings in November 2021 and replaced them with Government Support Ratings and Shareholder Support Ratings.

rating does not assess the bank’s intrinsic credit quality and reflects only whether the rating agency thinks a bank would receive support if needed. The support rating is available for many banks internationally and puts a floor on the bank’s long-term rating. Banks with a support rating of 1 have a minimum long-term rating floor of A–.

I show that a higher probability of external support corresponds to greater sovereign risk exposure for banks worldwide. Suppose investors believe that a bank can count on a backstop from its home government in bad states. Now, suppose the market believes that government’s riskiness has increased. If the government decides to finance a bank intervention, all else equal, the government will face higher borrowing costs, meaning either the intervention is less likely or the intervention is offered with worse terms. In either case, bank shareholders would be worse off.

To test the hypothesis, I use the members of the Bloomberg Banks Index, which includes 156 leading global bank stocks from 43 countries. Of the 156 banks, 130 have Fitch support ratings. Figure 8 shows each country’s average Fitch support rating and the number of ratings included in the average. For example, all three Japanese banks in the index have an “extremely high probability of external support,” consistent with Japan’s long history of government support of forbearance. Banks in other developed market countries cannot rely as much on external support, and all 19 U.S. banks in the index have a support rating of 5. Emerging market countries have a higher probability of external support. China’s 25 banks have an average support rating of 1.7: 12 banks have a support rating of 1, and none have a support rating over 3.

Figure 9 plots the bins of countries’ support rating against bank beta to the country’s sovereign risk factor, where I calculate the sovereign risk factors in an analogous method as for the U.S.-based *GovFac* described previously. I calculate each beta by regressing the bank’s daily return against the one-day lag of the relevant country’s sovereign risk factor during the pre-crisis period. A higher beta to sovereign risk shows greater dependence on sovereign risk and corresponds to a higher probability of external support, and the corresponding regression shows a significant relationship.

Table A.10 confirms the relationship. Excluding Saudi Arabia, as in the figure, a one-notch lower probability of support reduces a bank’s sovereign beta by 0.008, and the coefficient is –0.003 with country fixed effects.

6 Conclusion

The borrowers that forbearance keeps alive are claims on the government's budget. Banks roll over their loans only as long as regulators allow it, and regulators permit it only as long as the government could absorb the losses, so zombie equity loads on the sovereign's budget constraint. I show that this exposure is priced. In Japan, an intermediary leverage factor prices zombie portfolios but not non-zombie or Fama–French portfolios, and the sovereign risk component of the factor drives the result; bank-dependent firms that are not zombies are priced by the orthogonal component. Zombies have a 30% higher beta to sovereign risk than non-zombies, a gap that disappears once I control for bank returns, and they underperformed after each of the November 1997 failures that tested the government's backstop of the banking system. The price of forbearance is the sovereign risk component of intermediary risk.

When government support is direct rather than intermediated, the same exposure appears without banks. A U.S. sovereign risk factor prices portfolios of government suppliers, is not spanned by the market, size, and value factors, and does not price the Fama–French portfolios. A one standard deviation increase in beta raises the annualized risk premium by 4.8 percentage points, suppliers' betas increase with their government sales ratios, and suppliers underperformed after the 2011 downgrade. Internationally, banks with a higher Fitch support rating have a higher beta to their home sovereign's risk factor.

The results imply that the intermediary pricing of Japanese equities reflects the sovereign standing behind the banks as much as the banks themselves, so tests of intermediary pricing in economies with widespread forbearance should separate the sovereign component of intermediary capital from the private one. And forbearance is a contingent liability whose cost appears in the cross-section of returns before it appears in the budget: wherever a government condones the rollover of non-performing loans, the equity of the firms it keeps alive should load on sovereign risk.

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Tables

Portfolios	Prices of Risk: $\mathbb{E}[R_{i,t}^e] = \lambda_0 + \hat{\beta}'_{i,f} \lambda_f$								
	Zombies			Non-zombies			Fama–French		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>LevFac_{JP}</i>	11.790 (2.19)			−3.212 (−0.56)			5.902 (1.31)		
<i>LevFac_{predicted}</i>		1.365 (1.96)			0.630 (0.76)			1.340 (2.06)	
<i>LevFac_{residual}</i>			7.781 (1.69)			7.920 (1.31)			9.320 (1.60)
Ann. Risk Premium ($\sigma^\beta \times \lambda$)	2.01	1.91	1.62	−0.82	1.47	1.80	1.19	2.14	1.42
TS GRS p -value	0.11	0.23	0.24	0.33	0.11	0.57	0.42	0.35	0.08
MAPE (%)	2.14	3.05	2.18	2.76	3.26	2.60	2.37	2.77	2.42
TS Avg R^2	0.14	0.02	0.18	0.13	0.03	0.12	0.15	0.01	0.18
Quarters (T)	79	65	65	58	50	50	82	65	65
Portfolios (N)	25	25	25	25	25	25	25	25	25

Table 1: Intermediary Asset Pricing of Japanese Portfolios. Table presents the cross-sectional pricing results for size-and-book-to-market quarterly portfolios: 25 zombie portfolios, 25 non-zombie portfolios, and 25 Fama–French portfolios. The regressions test if the Japanese intermediary factor and its components price the portfolios. *LevFac_{JP}* is the Japanese intermediary leverage factor, and its components are *LevFac_{predicted}* and *LevFac_{residual}*. *LevFac_{predicted}* is correlated with sovereign risk, and *LevFac_{residual}* is orthogonal to sovereign risk. See the text for additional details on the factors. Coefficients are the price of risk estimates, and GMM t -statistics are reported. Intercept is included in each regression but omitted from the table. Ann. Risk Premium ($\sigma^\beta \times \lambda$) is the annualized increase in expected risk premium associated with a one standard deviation increase in the portfolio’s beta to the intermediary factor or factor component. TS GRS p -value is the p -value of the Gibbons–Ross–Shanken test of whether the pricing errors are jointly zero. MAPE is the mean absolute pricing error. TS Avg R^2 is the average time-series R^2 . See Tables A.1, A.2, and A.3 for results with the inclusion of the market factor, results using the capital ratio factor, results adding the 10 momentum portfolios, and results with a horserace between the two components of the intermediary factors.

Bank Dependence Measure	Prices of Risk: $\mathbb{E}[R_{i,t}^e] = \lambda_0 + \hat{\beta}'_{i,f} \lambda_f$								
	External Finance			Bank Beta			No Issuer Rating		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>LevFac_{JP}</i>	11.787 (2.43)			9.017 (2.16)			14.209 (2.83)		
<i>LevFac_{predicted}</i>		1.409 (1.62)			0.737 (1.21)			1.636 (1.83)	
<i>LevFac_{residual}</i>			10.529 (2.22)			11.376 (2.42)			14.320 (2.76)
Ann. Risk Premium ($\sigma^\beta \times \lambda$)	3.02	2.03	2.49	2.32	1.45	2.98	3.08	2.76	3.32
TS GRS p -value	0.16	0.76	0.28	0.01	0.01	0.02	0.01	0.09	0.06
MAPE (%)	1.96	3.12	1.88	2.34	3.42	2.11	2.13	2.65	2.19
TS Avg R^2	0.20	0.03	0.22	0.19	0.03	0.24	0.11	0.02	0.13
Quarters (T)	68	65	65	79	65	65	75	63	63
Portfolios (N)	35	35	35	35	35	35	35	35	35

Table 2: Intermediary Asset Pricing of Japanese Bank-Dependent Portfolios. Table presents the cross-sectional pricing results for quarterly portfolios: 25 size-and-book-to-market bank-dependent portfolios and 10 momentum bank-dependent portfolios. Firms are classified as bank dependent using three bank dependence measures separately, and bank-dependent portfolios are formed of bank-dependent firms. See the text for additional details on the bank dependence measures and portfolio construction. The regressions test if the Japanese intermediary factor and its components price the portfolios. *LevFac_{JP}* is the Japanese intermediary leverage factor, and its components are *LevFac_{predicted}* and *LevFac_{residual}*. *LevFac_{predicted}* is correlated with sovereign risk, and *LevFac_{residual}* is orthogonal to sovereign risk. See the text for additional details on the factors. Coefficients are the price of risk estimates, and GMM t -statistics are reported. Intercept is included in each regression but omitted from the table. Ann. Risk Premium ($\sigma^\beta \times \lambda$) is the annualized increase in expected risk premium associated with a one standard deviation increase in the portfolio's beta to the intermediary factor or factor component. TS GRS p -value is the p -value of the Gibbons–Ross–Shanken test of whether the pricing errors are jointly zero. MAPE is the mean absolute pricing error. TS Avg R^2 is the average time-series R^2 . See Tables A.4, A.5, and A.6 for results with the inclusion of the market factor, results using the capital ratio factor, and results with a horserace between the two components of the intermediary factors.

	(1) Return	(2) Return	(3) Return	(4) Return	(5) Return
$GovFac_{JP}$	1.183*** (87.12)	0.985*** (40.47)	1.123*** (44.31)	0.387*** (18.33)	-0.010 (-0.48)
$GovFac_{JP} \times \mathbb{I}(\text{Zombie})$		0.294*** (10.16)	0.251*** (8.53)	0.042 (1.72)	0.007 (0.31)
Bank Return				53.378*** (270.44)	6.588*** (31.42)
Bank Return $\times \mathbb{I}(\text{Zombie})$				3.645*** (15.27)	2.280*** (10.48)
$\mathbb{I}(\text{Zombie})$					0.002 (0.62)
Market Return					73.977*** (376.07)
Constant	0.003* (1.96)	0.003* (2.35)	-0.063*** (-5.23)	-0.007 (-0.61)	0.006 (0.51)
N	2,436,106	2,436,106	2,436,106	2,436,106	2,272,511
Adj. R^2	0.00	0.00	0.01	0.20	0.28
Year FE	No	No	Yes	Yes	Yes
SIC FE	No	No	Yes	Yes	Yes

Table 3: Beta of Japanese Firms to the Japanese Sovereign Risk Factor. Table presents time-series regressions at the daily level. The dependent variable is the return in basis points. Independent variables include the Japanese sovereign risk factor, $GovFac_{JP}$, and the Japanese value-weighted bank return. $\mathbb{I}(\text{Zombie}) = 1$ if the firm is a zombie, and 0 otherwise. t -statistics using robust standard errors are reported in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Prices of Risk: $\mathbb{E}[R_{i,t}^e] = \lambda_0 + \hat{\beta}'_{i,f} \lambda_f$										
Portfolios	Gov't Suppliers + Banks + Autos			Gov't Suppliers			Fama–French			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	0.244 (0.57)	−0.127 (−0.18)	−0.044 (−0.07)	0.121 (0.18)	−0.553 (−0.54)	−0.337 (−0.32)	0.787 (1.93)	0.969 (2.11)	0.801 (1.83)	1.681 (3.83)
<i>GovFac</i>	0.412 (2.60)	0.394 (2.42)	0.429 (2.35)	0.548 (2.29)	0.517 (2.20)	0.474 (1.93)	−0.052 (−0.34)	−0.052 (−0.34)	−0.009 (−0.08)	
<i>Mkt</i> − <i>R_f</i>		0.725 (1.07)	0.631 (0.85)		1.224 (1.32)	1.253 (1.18)		−0.197 (−0.36)	−0.027 (−0.05)	−0.952 (−2.12)
<i>SMB</i>			−0.056 (−0.21)			−0.271 (−0.72)			−0.011 (−0.06)	0.111 (1.03)
<i>HML</i>			0.329 (0.89)			1.069 (1.12)			−0.120 (−0.65)	0.367 (3.38)
Ann. Risk Premium ($\sigma^\beta \times \lambda_{GovFac}$)	3.65	3.45	4.78	4.83	4.47	3.92	−0.21	−0.22	−0.02	
TS GRS <i>p</i> -value	0.00	0.00	0.00	0.42	0.46	0.50	0.00	0.00	0.00	0.00
MAPE (%)	0.76	0.58	0.56	0.73	0.59	0.55	0.57	0.16	0.13	0.12
TS Avg <i>R</i> ²	0.01	0.41	0.51	0.01	0.43	0.50	0.01	0.82	0.93	0.91
Months (<i>T</i>)	152	152	152	131	131	131	187	187	187	1,118
Portfolios (<i>N</i>)	31	31	31	25	25	25	25	25	25	25
80% Restriction	Yes	Yes	Yes	No	No	No	No	No	No	No

Table 4: Cross-Sectional Asset Pricing of U.S. Government-Dependent Portfolios. Table presents the cross-sectional pricing results for size-and-book-to-market monthly portfolios: 25 government suppliers portfolios, 6 bank portfolios, 6 auto portfolios, and 25 Fama–French portfolios. Government-dependent portfolios are required to have data for 80% of the time in the pooled regressions. The regressions test if the U.S. sovereign risk factor, *GovFac*, prices the portfolios. See the text for additional details on the factors and portfolios. Coefficients are the price of risk estimates, and GMM *t*-statistics are reported. Ann. Risk Premium ($\sigma^\beta \times \lambda_{GovFac}$) is the annualized increase in expected risk premium associated with a one standard deviation increase in the portfolio's beta to the sovereign risk factor. TS GRS *p*-value is the *p*-value of the Gibbons–Ross–Shanken test of whether the pricing errors are jointly zero. MAPE is the mean absolute pricing error. TS Avg *R*² is the average time-series *R*².

$\mathbb{E}[R_{i,t}^e] = \gamma_0 + \gamma_1(\text{Characteristic})$				
	(1)	(2)	(3)	(4)
Intercept	1.139 (4.61)	1.491 (2.77)	1.140 (4.61)	1.493 (2.77)
$\mathbb{I}(\text{Government Supplier})$	0.195 (2.26)	0.171 (2.04)		
Government Sales Ratio			0.239 (2.15)	0.207 (1.88)
$\ln(\text{Size})$		0.001 (0.02)		0.001 (0.02)
$\ln(\text{B/M})$		0.633 (7.55)		0.634 (7.54)
Months (T)	462	462	462	462
Firms (N)	17,329	17,329	17,329	17,329

Table 5: Cross-Sectional Asset Pricing of U.S. Firms using Firm Characteristics. Table presents the cross-sectional pricing results for monthly firm returns. The regressions test if the government suppliers have higher expected returns, and if firms with greater government dependence have higher expected returns. Coefficients are the price of risk estimates, and Fama–MacBeth t -statistics are reported.

	(1) <i>GovFac</i>	(2) <i>GovFac</i>	(3) <i>GovFac</i>	(4) <i>GovFac</i>
$Mkt - R_f$	0.014 (1.61)	0.011 (1.50)		
SMB	-0.022 (-1.38)		-0.011 (-0.73)	
HML	0.014 (0.89)			0.017 (1.11)
Constant	0.195*** (5.27)	0.194*** (5.33)	0.203*** (5.74)	0.204*** (5.75)
N	187	187	187	187
Adj. R^2	0.01	0.00	-0.00	0.00

Table 6: Spanning Tests of the U.S. Sovereign Risk Factor. Table presents time-series regressions at the monthly level. The dependent variable is the U.S. sovereign risk factor, *GovFac*. See the text for additional details on *GovFac*. Independent variables are Fama–French factors: the excess market return, *SMB*, and *HML*. t -statistics using robust standard errors are reported in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Examples of Government Suppliers	Examples of Non-suppliers
Aetna	Amazon
Anthem	Apple
Appian	AT&T
Boeing	Cisco
Booz Allen Hamilton	Coca-Cola
Caterpillar	Comcast
Con Edison	Disney
Corrections Corporation of America	Exxon Mobil
GE	Home Depot
Goodyear	Intel
HP	Johnson & Johnson
Honeywell	Mastercard
Huntington Ingalls	Merck
Lockheed Martin	Microsoft
Mathematica	Oracle
Northrop Grumman	Pepsi
PG&E	Pfizer
Raytheon	Procter & Gamble
Texas Instruments	Verizon
Walgreens	Walmart

Table 7: Examples of Government Suppliers and Non-suppliers. Table presents examples of government suppliers and non-suppliers. Government suppliers are firms with more than 10% of their annual sales coming from the federal government, and each company listed as a government supplier has more than a year of government sales over 10%.

	(1) Gov't Suppliers – Non-suppliers	(2) Government Suppliers	(3) Non- suppliers	(4) Gov't Suppliers – Non-suppliers	(5) Government Suppliers	(6) Non- suppliers
<i>GovFac</i>	0.316** (2.97)	0.327** (2.98)	0.011** (3.11)	0.392** (3.14)	0.406** (3.15)	0.014** (3.22)
Constant	0.000* (2.15)	0.000* (2.12)	0.000 (1.21)	0.001 (1.81)	0.001 (1.79)	0.000 (0.69)
<i>N</i>	3,862	3,862	3,862	3,862	3,862	3,862
Adj. R^2	0.00	0.00	0.00	0.00	0.00	0.00
Year FE	No	No	No	Yes	Yes	Yes

Table 8: Beta of Government Suppliers to the U.S. Sovereign Risk Factor. Table presents time-series regressions at the daily level. The dependent variable is the value-weighted portfolio return in percent. The government suppliers portfolio consists of firms with more than 10% of their annual sales coming from the federal government. The non-suppliers portfolio includes firms with less than 10% of their annual sales coming from the federal government or no government sales reported. The independent variable is the U.S. sovereign risk factor, *GovFac*. See the text for additional details on the *GovFac*. *t*-statistics using robust standard errors are reported in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figures

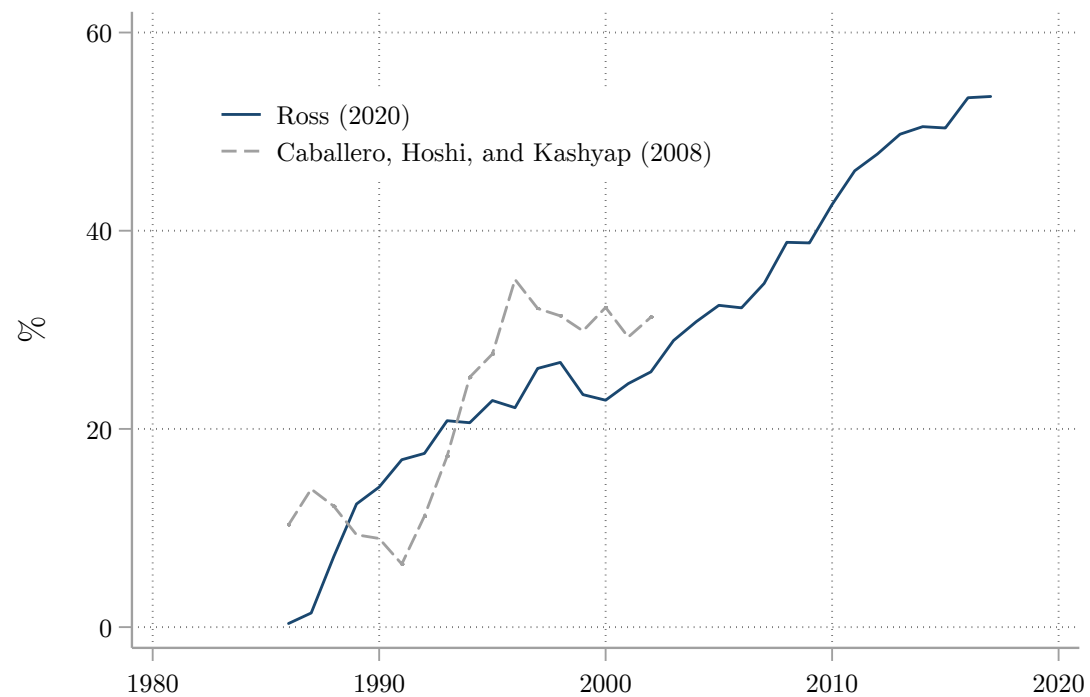


Figure 1: Percentage of Zombie Firms in Japan. Figure compares the percentage of Japanese zombies in the data and the zombie percentage from Caballero et al. (2008). Zombies are identified on a monthly basis, and the plotted percentage is the annual average.

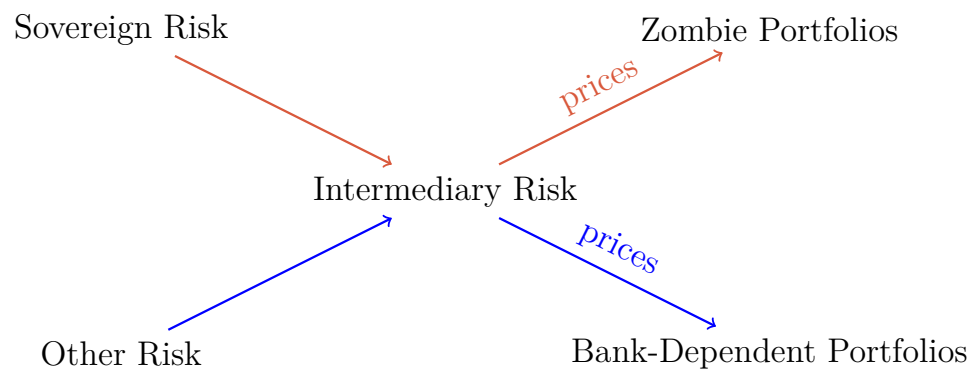


Figure 2: Intermediary Asset Pricing Summary. Figure summarizes the Japanese intermediary asset pricing results. Intermediary risk factors price zombie portfolios and bank-dependent portfolios, which differ in their government dependence. Under government-condoned forbearance, intermediary risk has two components: one correlated with sovereign risk, one orthogonal to sovereign risk. The former prices zombies, and the latter prices bank-dependent portfolios.

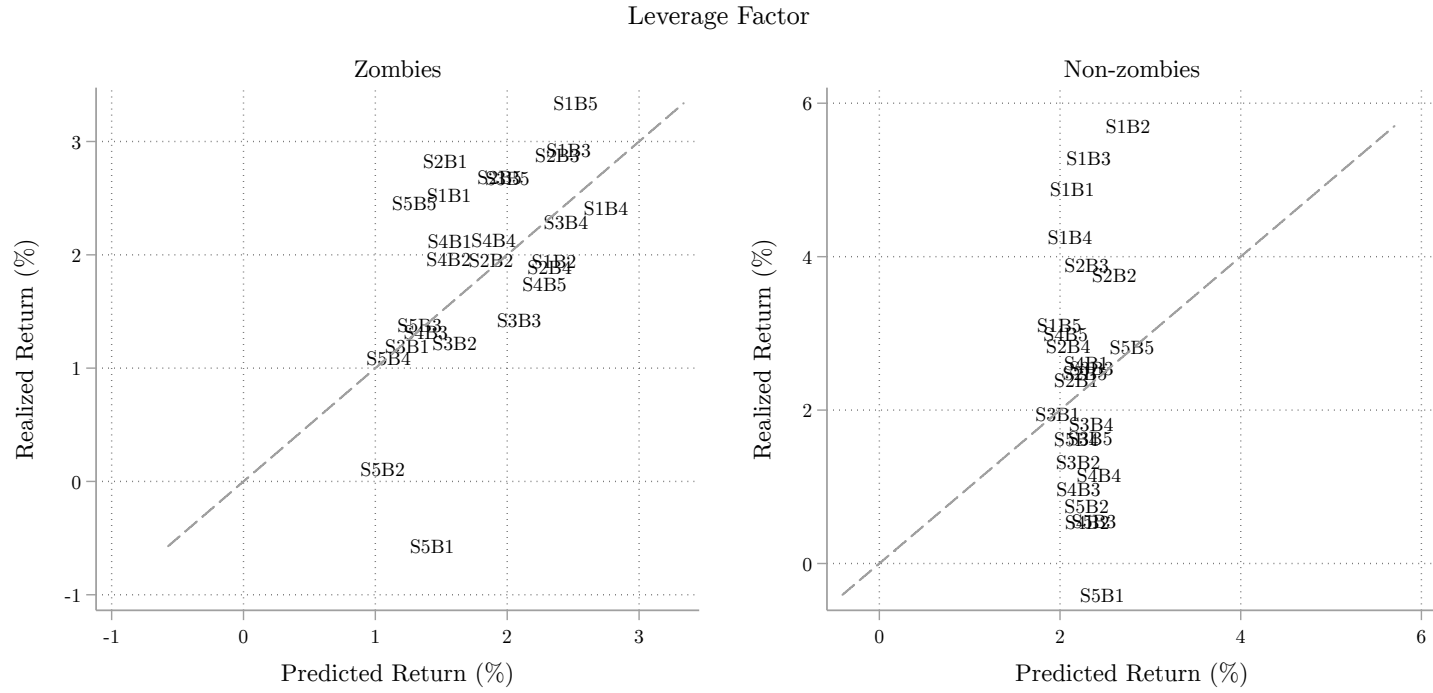


Figure 3: Realized vs. Predicted Returns using the Intermediary Leverage Factor. Figure shows the realized and predicted excess returns of size-and-book-to-market portfolios. 25 zombie portfolios and 25 non-zombie portfolios are used. Predicted returns are calculated using quarterly regressions and the intermediary leverage factor, $LevFac_{JP}$.

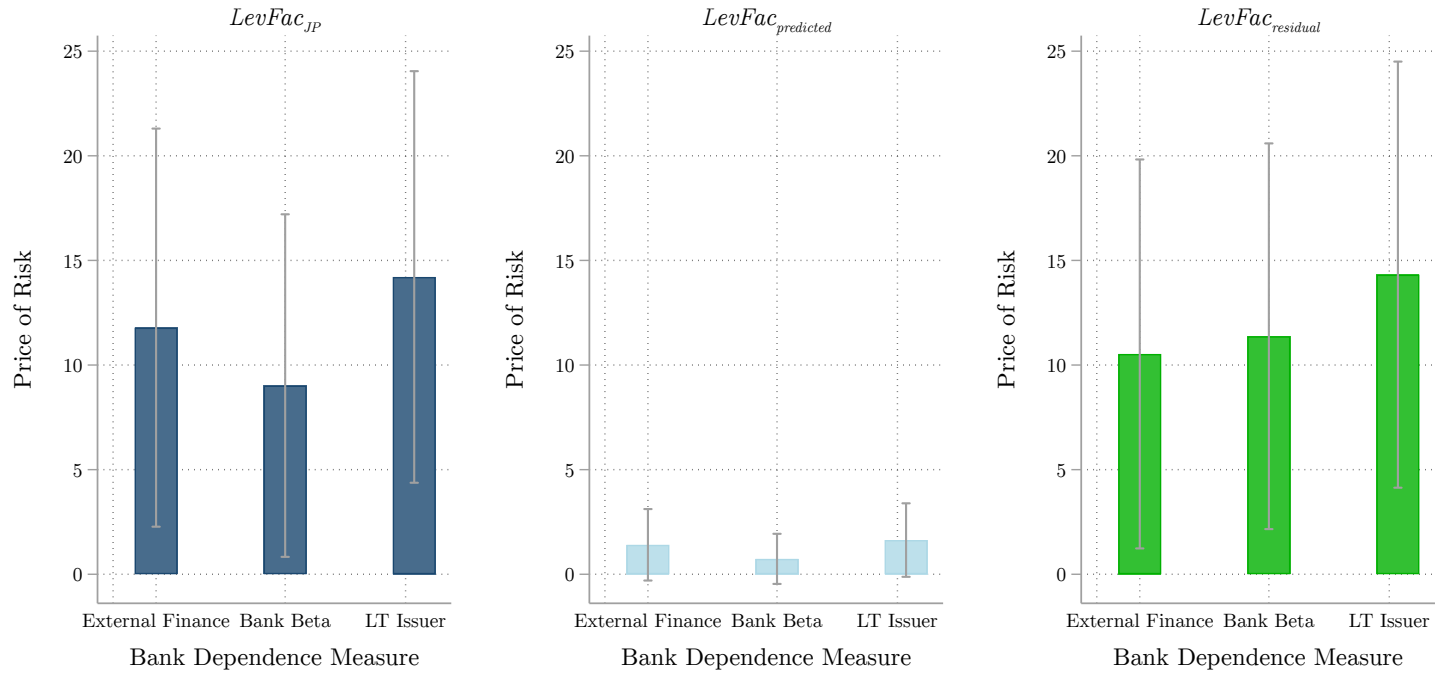


Figure 4: Price of Risk for Bank-Dependent Portfolios. Figure plots the prices of risk from Table 2 with GMM standard error bars. Each bar is the price of risk from the cross-sectional regression of 35 quarterly bank-dependent portfolios—25 sorted on size and book-to-market and 10 sorted on momentum—on the intermediary leverage factor, $LevFac_{JP}$, or one of its components. $LevFac_{predicted}$ is correlated with sovereign risk, and $LevFac_{residual}$ is orthogonal to sovereign risk. Firms are classified as bank dependent using three separate measures—external finance dependence, bank beta, and the absence of a long-term issuer rating—and a separate set of portfolios is formed for each measure. See the text for details on the construction of the factors and portfolios.

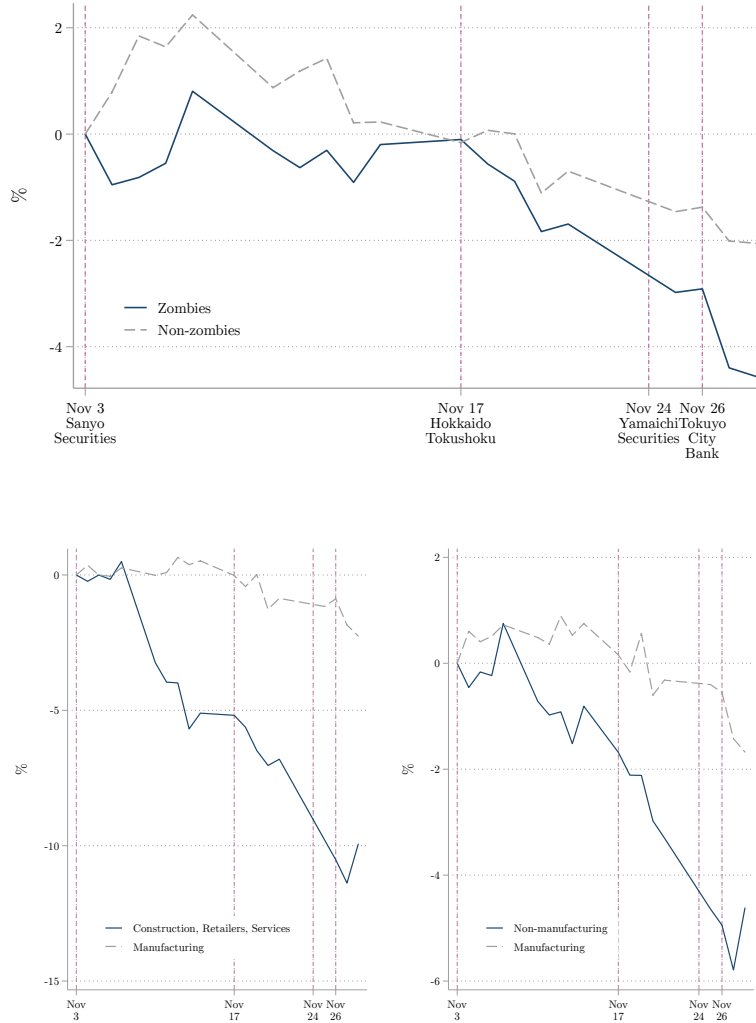


Figure 5: Cumulative Abnormal Returns in Japan, November 1997. Figure shows the daily value-weighted cumulative abnormal returns. Each firm's abnormal returns are calculated as the difference between the realized return and predicted return, which is estimated using the CAPM beta before November 3, 1997, the day of the Sanyo Securities' failure. Vertical lines mark the dates of the four bank failures. Top panel shows value-weighted cumulative abnormal returns for zombies and non-zombies. Figures in the bottom panel show the daily value-weighted cumulative abnormal returns for manufacturing and non-manufacturing firms. Bottom left panel considers construction companies, retailers, and services firms as non-manufacturing. Bottom right panel includes other non-manufacturing industries.

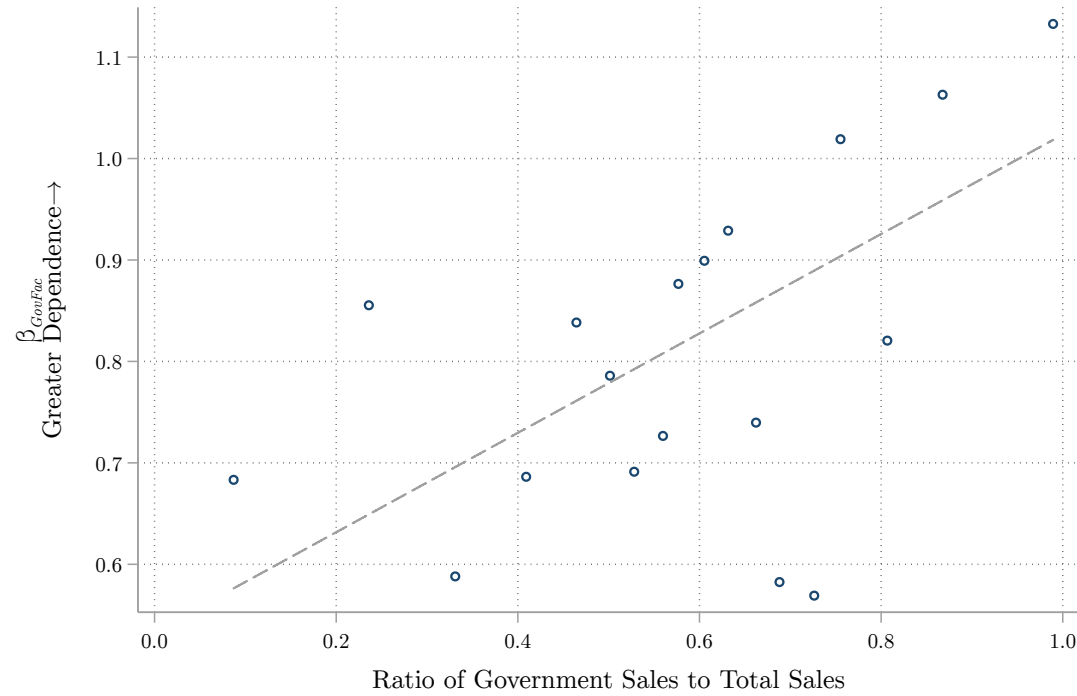


Figure 6: Sovereign Risk and the Ratio of Government Sales To Total Sales. Figure is a binned scatterplot of beta to the U.S. sovereign risk factor against the average government sales ratio. Each value is calculated at the industry level.

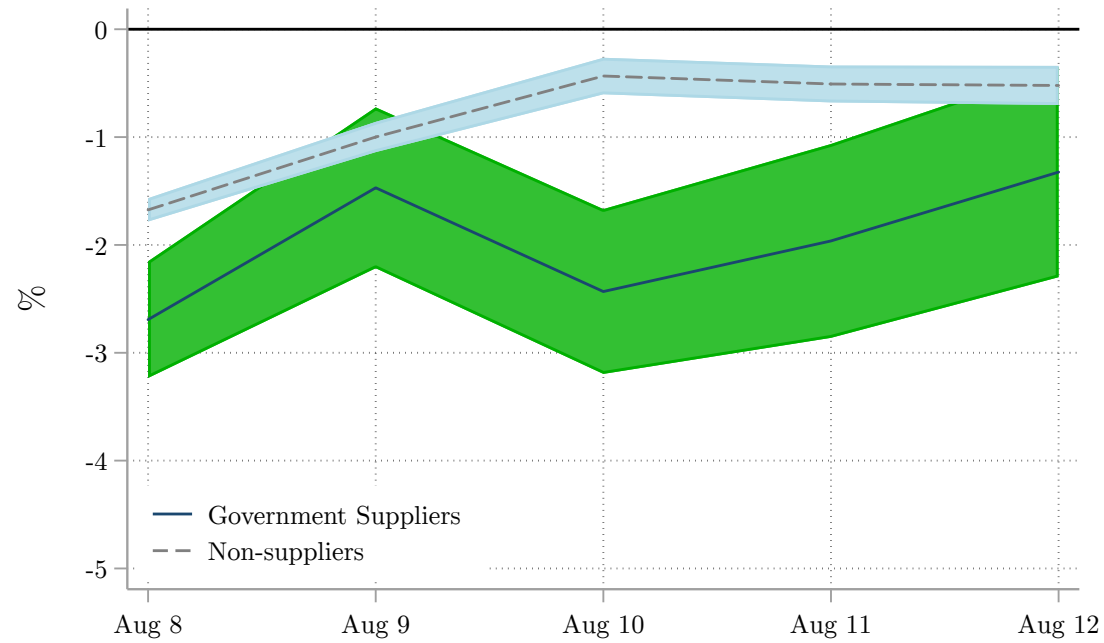


Figure 7: Cumulative Abnormal Return of Government Suppliers and Non-suppliers After the U.S. Sovereign Debt Downgrade. Figure shows the daily average cumulative abnormal returns in the week after the U.S. sovereign debt downgrade and its standard errors. I calculate each firm's abnormal returns as the difference between the realized return and predicted return using the estimated CAPM market beta before August 5, 2011, the day of the downgrade. I calculate the daily average separately for government suppliers and non-suppliers.

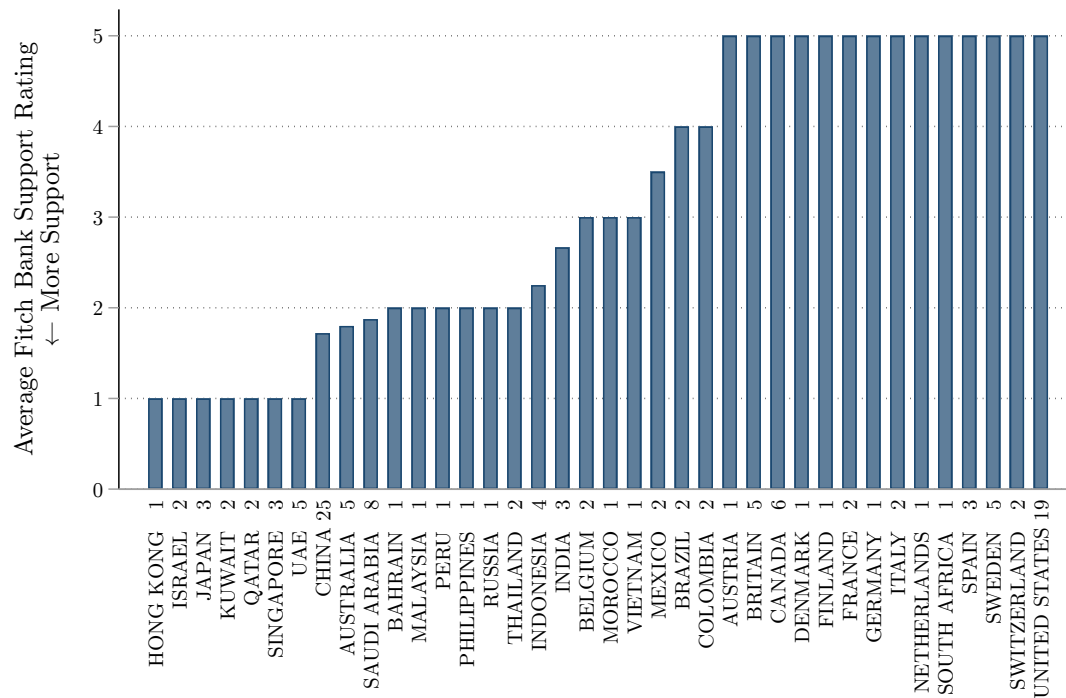


Figure 8: Average Fitch Bank Support Rating. Figure shows each country's average Fitch bank support rating, calculated as the average rating for banks included in the Bloomberg Banks Index. The number next to each country's label is the number of ratings available for that country.

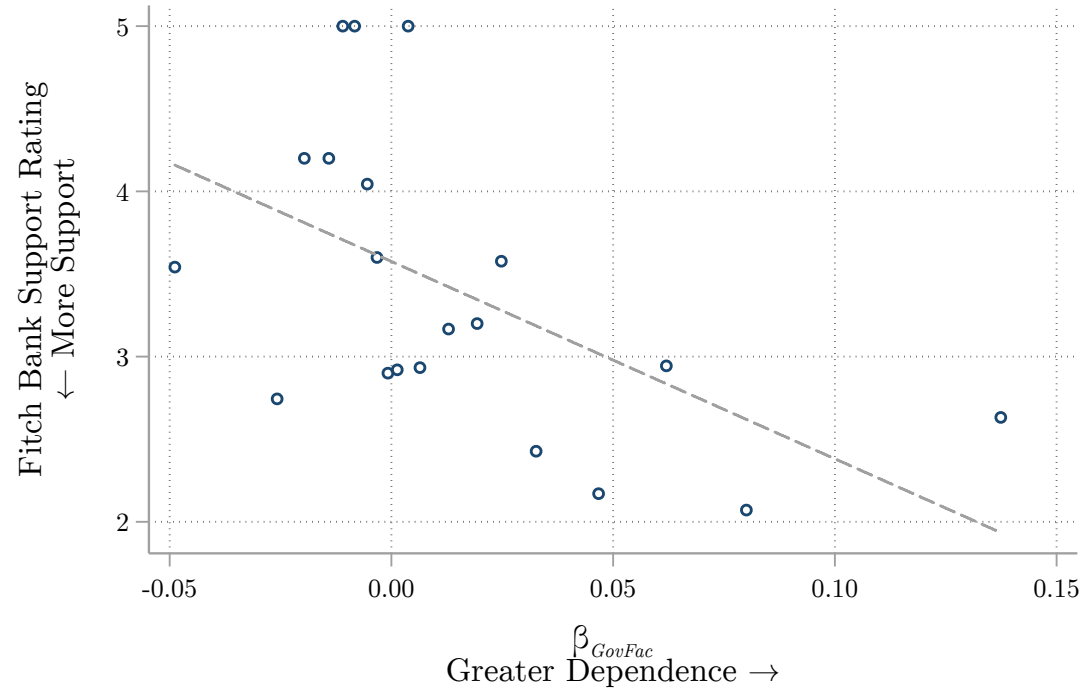


Figure 9: Fitch Bank Support Ratings and Beta to Sovereign Risk. Figure is a binned scatterplot of countries' average Fitch bank support ratings against banks' return beta to the domestic sovereign risk factor. I calculate a country-specific *GovFac* for each country in a method analogous to the benchmark U.S.-based *GovFac*. I exclude Saudi Arabia given its large outlier value.

Appendix

A Derivations for the Forbearance Framework

Government permission. Let F denote fiscal resources net of baseline resolution costs. The government chooses other public spending C and permission decisions $S_i \in \{0, 1\}$:

$$\max_{C, \{S_i\}} u(C) + \int H_i S_i di \quad \text{subject to} \quad C + \int c_i S_i di \leq F, \quad u' > 0, \quad u'' < 0. \quad (\text{A.1})$$

I measure the incremental fiscal cost $c_i > 0$ in present value relative to prompt resolution. It does not have to be an immediate payment to the bank. With interior spending, the budget multiplier is $\psi = u'(C)$, and the government grants permission when $H_i \geq c_i \psi$.

I assume $H_i \sim U[\underline{H}_i, \bar{H}_i]$, independently across borrowers and of aggregate shocks, and define $w_i = \bar{H}_i - \underline{H}_i > 0$. These values are uncertain at date 0 and observed before the date-1 permission decision. With interior permission probabilities in every state, $\bar{\psi} = \mathbb{E}[\psi]$, and $G = \bar{\psi} - \psi$,

$$q_i(G) = \frac{\bar{H}_i - c_i(\bar{\psi} - G)}{w_i} = \bar{q}_i + \kappa_i G, \quad \bar{q}_i = \frac{\bar{H}_i - c_i \bar{\psi}}{w_i}, \quad \kappa_i = \frac{c_i}{w_i} > 0. \quad (\text{A.2})$$

The budget binds because $u' > 0$. With firm-specific uncertainty averaging out across borrowers,

$$F = (u')^{-1}(\psi) + \int c_i \frac{\bar{H}_i - c_i \psi}{w_i} di, \quad \frac{dF}{d\psi} = \frac{1}{u''(C)} - \int \frac{c_i^2}{w_i} di < 0. \quad (\text{A.3})$$

A fall in F raises ψ , and a rise in ψ lowers every q_i .

Bank renewal. Let $k_i > 0$ denote the net cost of renewal relative to resolution, including differences in expected loan recoveries and concessions but excluding the value of postponing a write-down. Permission allows the bank to defer a loss $\ell_i > 0$. Let $\nu(B) > 0$ be the shadow value of book capital, with $\nu'(B) < 0$. I focus on loans for which renewal is feasible and

$$\nu(B)\ell_i > k_i \quad (\text{A.4})$$

throughout the support of B . With permission, the bank prefers renewal. Without permission, it must recognize the loss even if it renews, so resolution avoids the net renewal cost k_i .

Zombie equity pays $X_i^Z = V_i S_i$, with $\mathbb{E}[X_i^Z \mid G, B] = V_i(\bar{q}_i + \kappa_i G)$. Comparing with (2) gives $\bar{X}_i = V_i \bar{q}_i$, $\chi_i = \kappa_i / \bar{q}_i$, and $\delta_i = 0$.

Prices and betas. I take G and B to be bounded, independent, mean-zero, nondegenerate shocks, and payoffs to be nonnegative with strictly positive means. Intermediary capital and the pricing kernel are

$$K = \bar{K} + a_G G + a_B B \geq \underline{K} > 0, \quad m = \frac{K^{-\gamma}}{R_f \mathbb{E}[K^{-\gamma}]}, \quad \gamma > 0, \quad a_G \neq 0, \quad a_B > 0. \quad (\text{A.5})$$

This normalization implies $\mathbb{E}[m] = 1/R_f$.

I write $\varepsilon_i = X_i - \bar{X}_i(1 + \chi_i G + \delta_i B)$. By (2), $\mathbb{E}[\varepsilon_i \mid G, B] = 0$. Since m depends only on (G, B) , $\mathbb{E}[m\varepsilon_i] = 0$. Using the definitions of the risk prices in the main text and setting $D_i = 1 - \chi_i \lambda_G - \delta_i \lambda_B$ gives

$$P_i = \frac{\bar{X}_i}{R_f} D_i, \quad \beta_{iG} = \frac{R_f \chi_i}{D_i}, \quad \beta_{iB} = \frac{R_f \delta_i}{D_i}. \quad (\text{A.6})$$

Prices are positive, so $D_i > 0$, and $\mathbb{E}[R_i] = R_f/D_i$ gives (3).

Conditional expected marginal utility is decreasing in B , so $\lambda_B > 0$. Conditional on G , it falls in G when $a_G > 0$ and rises when $a_G < 0$, so $\text{sign}(\lambda_G) = \text{sign}(a_G)$.

For a zombie, $\delta_i = 0$, and

$$\frac{\partial \beta_{iG}}{\partial \chi_i} = \frac{R_f}{(1 - \chi_i \lambda_G)^2} > 0, \quad \frac{\partial (\mathbb{E}[R_i] - R_f)}{\partial \chi_i} = \frac{R_f \lambda_G}{(1 - \chi_i \lambda_G)^2}. \quad (\text{A.7})$$

For a firm exposed only through ordinary lending, $\partial \beta_{iB} / \partial \delta_i = R_f / (1 - \delta_i \lambda_B)^2 > 0$. For a supplier with $\chi_i = \xi s_i$ and $\delta_i = 0$,

$$\beta_{iG} = \frac{R_f \xi s_i}{1 - \xi s_i \lambda_G}, \quad \frac{\partial \beta_{iG}}{\partial s_i} = \frac{R_f \xi}{(1 - \xi s_i \lambda_G)^2} > 0. \quad (\text{A.8})$$

The conditional return response is

$$\mathbb{E}[R_i - \mathbb{E}[R_i] \mid G, B] = \beta_{iG} G + \beta_{iB} B. \quad (\text{A.9})$$

A fall in G lowers the conditional expected return of any firm with $\beta_{iG} > 0$.

Factor interpretation. Independence implies that the population projection of $K - \bar{K}$ on G is $a_G G$, with residual $a_B B$. Scaling a factor changes its beta and price of risk inversely, $\beta_{i,a_G G} = \beta_{iG}/a_G$ and $\lambda_{a_G G} = a_G \lambda_G$, and leaves the product unchanged.

B Data

U.S. Sovereign Risk Factor Correlations The U.S. sovereign risk factor, *GovFac*, is correlated with other measures of sovereign risk. I study two sets of measures. First, I show that *GovFac* is significantly correlated with the news-implied volatility indexes from Manela and Moreira (2017). Second, I show that *GovFac* correlates with the Risk 1A long-short portfolio returns from Ross (2019).

Manela and Moreira (2017) create a news-implied volatility index, *NVIX*, which is a text-based measure of uncertainty using articles from *The Wall Street Journal*. *NVIX* spikes during financial crises, market crashes, and periods of elevated policy uncertainty. *NVIX* is decomposed into categories of disaster risk, including “Financial Intermediation,” “Stock Markets,” and “Government,” which reflects policy-related uncertainty. An increase in *NVIX* or its components reflects an increase in risk and uncertainty.

Ross (2019) uses textual analysis of Item 1A of firms’ annual filings to create 50 long-short portfolios based on firms’ exposure to each risk. A firm’s exposure is captured by the firm’s relevance to common risks in Item 1A. “Taxes” or “Regulations” risk portfolios are two of the government-related portfolios.

Table A.7 regresses the U.S. sovereign risk factor on the news-implied volatility indexes and the Risk 1A portfolios. When the government becomes more constrained (*GovFac* decreases), news-implied volatility increases both in the aggregate and in the Government, Financial Intermediation, and Stock Market components. When sovereign risk increases, firms with high Tax or Regulations risk exposure also have lower returns.

Constructing Par-equivalent CDS U.S. sovereign CDS data are from Markit and begins in 2003. For the 1984 event study, I construct a longer time-series by creating a synthetic sovereign CDS spread that is the par-equivalent CDS spread and begins in 1962. Then I use the synthetic spread and the same method from Equations 6 and 7 to form the synthetic sovereign risk factor, *GovFac_{synthetic}*.

To create the par-equivalent CDS spread, I use the CRSP Treasuries dataset, Libor swap rates, and the U.S. yield curve. For each date, I choose the bond in the CRSP Treasuries dataset that is deliverable against a 5-year CDS contract and cheapest to buy. I use this bond’s dirty price and coupon. I iterate through CDS spread values between 0 and 250bps, incrementing by 0.25bps, to find the CDS spread that gives the CDS-implied bond price that most closely matches the realized bond price. I assume a recovery rate of 0.4, a semi-annual CDS, and a face value of 100. I use Libor swap rates, when available, for the risk-free rates, and I linearly interpolate these swap rates to get semi-annual rates. When Libor is unavailable, I use the U.S. Treasury yield curve from the St. Louis FRED.

Figure A.1 plots the par-equivalent synthetic sovereign CDS spread, spliced with the actual U.S. sovereign CDS spread from Markit. The synthetic spread is demeaned and scaled to match the actual CDS spread on the first day the CDS spread data.

C Implicit Guarantees: Banks and Auto Companies

Large U.S. banks and auto companies are government dependent through implicit guarantees rather than sales. This appendix shows that their sovereign risk exposure increased after the 1984 too-big-to-fail announcement and the 2008 auto bailout. The results are consistent with the framework in Section 2—an announcement of support raises a firm’s exposure to the government’s fiscal capacity—and they complement the international evidence on bank support ratings in Section 5.3. Because they overlap with Kelly et al. (2016a), Gandhi et al. (2020), and Berndt et al. (2025), I report them here rather than in the main text.

C.1 Banks

Large banks are government dependent through implicit guarantees. Unlike virtually all other industries, banks are widely believed to have recourse to the government purse in bad states, due to the negative externalities of bank failures and financial instability.

I perform an event study around the announcement that some U.S. banks were too big to fail. In 1984, amid the bailout of Continental Illinois, regulators acknowledged that the largest banks were too big to fail. Following the event, sovereign risk exposures increased for the largest banks, and when the government becomes constrained, the largest commercial banks have lower returns than other commercial banks. Section 5.3 shows that the same

dependence holds for banks globally: banks with a higher Fitch-assessed probability of government support have greater domestic sovereign risk exposure.

Too Big to Fail On September 19, 1984, the Comptroller of the Currency testified before the House Banking Committee on the \$4.5 billion rescue of Continental Illinois. At the time, Continental Illinois was the largest bank failure in U.S. history. During his testimony, the Comptroller acknowledged that some banks were too big to fail and said this policy applied to the 11 largest banks. The Comptroller did not name the banks, and the Dow Jones Broad Tape did not initially mention too big to fail (O’Hara and Shaw, 1990). The next day, however, *The Wall Street Journal (WSJ)* published a list of the 11 largest banks based on year-end 1983 assets, drawing considerable attention to the initially-overlooked event. The *WSJ* event made banks’ implicit support explicit and common knowledge, and it categorized banks into two groups: too big to fail versus too small to save.

After the event, the 11 affected banks had greater sovereign risk exposure: when the government becomes more fiscally constrained, the returns of the 11 named banks decline. I regress each commercial bank i ’s returns on the synthetic U.S. sovereign risk factor, and the factor interacted with indicators for being in the treatment group of the 11 banks cited in the *WSJ* article, after the *WSJ* article was published, and both.

$$\begin{aligned}
R_{i,t} = & \alpha \\
& + \beta_1 GovFac_{synthetic,t} \\
& + \beta_2 GovFac_{synthetic,t} \times \mathbb{I}(WSJ) \\
& + \beta_3 GovFac_{synthetic,t} \times \mathbb{I}(Post) \\
& + \beta_4 GovFac_{synthetic,t} \times \mathbb{I}(WSJ) \times \mathbb{I}(Post) + \varepsilon_{i,t}
\end{aligned} \tag{A.10}$$

where i is a commercial bank, t is a day, $\mathbb{I}(Post)$ is an indicator for after the event, and $\mathbb{I}(WSJ)$ is an indicator for the 11 banks cited by the *WSJ*.

Table A.8 shows the regression results for commercial banks and for the top 50 commercial banks. When the government becomes constrained and $GovFac_{synthetic}$ decreases, commercial bank returns decline on average (columns 1 and 6). The coefficient of 0.007 translates to a decrease in annualized return of roughly 1.5 percentage points (PP) for a one standard deviation decrease in $GovFac_{synthetic}$.

The *WSJ* banks have higher beta to sovereign risk than other commercial banks. The too big to fail banks have more than quadruple the sovereign risk exposure of other commercial banks and more than triple the exposure of other large commercial banks (columns 2 and 7). The coefficient for the risk factor interacted with both indicators, β_4 , is positive and significant. After the event, the 11 *WSJ* banks have greater sovereign risk exposure. Moreover, after the event, banks that were not one of the treated 11 banks had lower beta. This result is consistent with investors initially believing large banks were, in general, dependent on the government, and then updating their beliefs after the event separated banks that could expect extraordinary support from banks that could not.

The result is robust to adding additional controls, using a shorter period, separate estimations for national and commercial banks, restricting the control group to only the largest 50 banks at each point in time, and restricting the sample to banks on the border of the too big to fail cutoff. The result is also insignificant in a placebo test.

Figure A.2 plots the beta to the synthetic sovereign risk factor for the 11 *WSJ* banks and the beta of the next two largest banks: Mellon Bank and Crocker National Bank. After the event, the sovereign risk beta for the 11 *WSJ* banks jumped up. Meanwhile, the next two largest banks remained steady in their government dependence.⁷

C.2 Auto Companies

Auto companies are also government dependent through implicit guarantees. Auto companies are government dependent for many reasons: they are politically important and often seen as national champions, they are large and salient employers, and they can manufacture equipment for national security. Their implicit government backstop became explicit during the Global Financial Crisis when U.S. automakers received extraordinary support. The announcement of explicit government support for the largest auto companies created a new dependence on the government. After the announcement, auto returns increased their sovereign risk exposure, as measured by beta to the actual sovereign risk factor, compared to non-auto companies.

On October 3, 2008, the United States Congress passed the Emergency Economic Stabi-

⁷Mellon Bank and Crocker National Bank are the next two largest banks. They are the 13th and 14th largest banks because First Interstate Bancorp is ranked 7th, consistent with news articles, but not included in the *WSJ* article. Crocker merged with Wells Fargo in 1986.

lization Act of 2008. The legislation created the Troubled Asset Relief Program (TARP), which funded many crisis interventions, including the Capital Purchase Program for bank equity purchases and Term Asset-Backed Securities Loan Facility (TALF). On December 19, 2008, the U.S. Treasury unveiled the Automotive Industry Financing Program. The program used nearly \$80 billion of TARP funds to support the auto industry. The program rescued GM and Chrysler, two of the *Big Three* U.S. automakers.

Combined, Klier and Rubenstein (2012) estimate that GM received \$50.2 billion in financial aid through TARP, GMAC (and Ally) \$17.2 billion, Chrysler \$10.9 billion, and Chrysler Financial \$1.5 billion across the Bush and Obama administrations. Ford, the other member of the Big Three, avoided a TARP bailout since it had obtained a large line of credit a year ahead of the crisis. But Ford used the TALF and the Commercial Paper Funding Facility, and public perception of Ford differed little from that of GM and Chrysler. Ford's stock price dropped alongside GM's and Chrysler's, and Ford's CEO went with the CEOs from GM and Chrysler to request emergency aid from the Congress in November 2008 (Klier and Rubenstein, 2012).

I compare the returns of the Big Three automakers against the returns of a control group of non-auto non-commercial bank firms. I exclude commercial banks from the control group because I showed their government dependence in section C.1. I use the method from equation A.10. Table A.9 shows the result. Columns 2 and 7 show that automakers have greater sovereign risk exposure than the control group in general: for example, the average control group firm has a sovereign risk beta of 0.7, while the betas of the Big Three autos are almost double that at 1.3. Column 5 presents the full result. After the government support announcement, the beta to sovereign risk increases by 1.6 for the Big Three. After the bailout announcement, when the government's constraints tighten, automakers' returns decline more than other companies. The results are robust to adding additional controls, including the market return and industry fixed effects.

Figure A.3 shows the beta to the U.S. sovereign risk factor for auto companies and the control group. Before December 19, 2008, auto companies had a negative beta to the U.S. sovereign risk factor. After the bailout announcement, the beta turned positive and increased more sharply than the control group's beta.

D Intermediary Asset Pricing Details

Leverage and Capital Ratio Factors in the U.S. and Japan Leverage and the capital ratio are reciprocals, and the two intermediary factors should have opposite signs if the factors are constructed from similar firms. In the U.S., both the leverage and capital ratio factors have a positive and significant price of risk (Adrian et al. (2014) and He et al. (2017)) because they are formed from datasets that use different firms as intermediaries. The leverage factor uses data on securities broker-dealers from the Flow of Funds, which captures only the U.S. subsidiary component. The capital ratio factor uses data on primary dealer counterparties of the NY Fed, matched to the publicly-traded holding company level, and this list includes foreign dealers.

In Japan, securities broker-dealers and primary dealers overlap more than in the U.S. The Japanese intermediary factors have a -51% correlation, which is significant at the $\alpha = 0.01$ level. In the U.S., the factors have a correlation of -4.9% over the same period.⁸

⁸Using updated data of the U.S. factors from Tyler Muir’s and Asaf Manela’s websites, the U.S. factors have a correlation of 0.90% from 1970Q1 to 2017Q3. Using data available from 1998Q1, the start of the Japanese leverage factor data availability, the U.S. factors have a correlation of -4.9% . He et al. (2017) find that in the U.S., the two factors have a 14% correlation between 1970Q1 and 2012Q4.

Appendix Tables

Prices of Risk: $\mathbb{E}[R_{i,t}^e] = \lambda_0 + \hat{\beta}_{i,f}' \lambda_f$										
Panel A: Leverage Factor										
	25 Size-and-B/M Portfolios						25 Size-and-B/M + 10 Mom Portfolios			
	Zombies		Non-zombies		Fama–French		Zombies		Non-zombies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>LevFac_{JP}</i>	11.790 (2.19)	13.020 (2.38)	−3.212 (−0.56)	−4.030 (−0.65)	5.902 (1.31)	8.327 (1.41)	8.077 (1.68)	8.357 (1.77)	−3.010 (−0.59)	−2.760 (−0.54)
<i>Mkt</i> − <i>R_f</i>		−1.576 (−0.77)		3.741 (1.19)		−0.108 (−0.06)		−1.240 (−0.64)		2.838 (1.12)
Ann. Risk Premium ($\sigma^\beta \times \lambda$)	2.01	2.32	−0.82	−1.39	1.19	1.65	1.51	1.70	−0.75	−0.88
TS GRS <i>p</i> -value	0.11	0.07	0.33	0.34	0.42	0.46	0.14	0.06	0.59	0.60
MAPE (%)	2.14	0.88	2.76	1.43	2.37	0.87	1.95	0.77	2.48	1.28
TS Avg <i>R</i> ²	0.14	0.70	0.13	0.58	0.15	0.73	0.16	0.69	0.15	0.59
Quarters (<i>T</i>)	79	79	58	58	82	82	79	79	58	58
Portfolios (<i>N</i>)	25	25	25	25	25	25	35	35	35	35
Panel B: Capital Ratio Factor										
	25 Size-and-B/M Portfolios						25 Size-and-B/M + 10 Mom Portfolios			
	Zombies		Non-zombies		Fama–French		Zombies		Non-zombies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>CapFac_{JP}</i>	−8.675 (−1.97)	−9.601 (−1.91)	−2.644 (−0.70)	−3.910 (−0.99)	−4.585 (−0.91)	−4.378 (−0.84)	−6.531 (−1.71)	−6.930 (−1.69)	−2.728 (−0.72)	−3.744 (−0.93)
<i>Mkt</i> − <i>R_f</i>		−1.531 (−0.87)		−2.694 (−1.06)		0.056 (0.02)		−1.442 (−0.93)		−2.747 (−1.18)
Ann. Risk Premium ($\sigma^\beta \times \lambda$)	−1.97	−2.31	−1.41	−2.76	−0.93	−1.07	−1.61	−1.74	−1.39	−2.44
TS GRS <i>p</i> -value	0.20	0.43	0.83	0.93	0.42	0.68	0.37	0.55	0.43	0.56
MAPE (%)	2.73	0.82	2.77	1.12	2.59	0.46	2.54	0.78	2.62	0.98
TS Avg <i>R</i> ²	0.18	0.71	0.15	0.53	0.17	0.77	0.18	0.70	0.16	0.55
Quarters (<i>T</i>)	55	55	42	42	55	55	55	55	42	42
Portfolios (<i>N</i>)	25	25	25	25	25	25	35	35	35	35

Table A.1: Intermediary Asset Pricing of Japanese Portfolios. Table presents the cross-sectional pricing results for 25 size-and-book-to-market and 10 momentum quarterly portfolios. 35 zombie portfolios, 35 non-zombie portfolios, and 25 Fama–French portfolios are used. The regressions test if a Japanese intermediary factor prices the portfolios. *LevFac_{JP}* is the Japanese intermediary leverage factor, and *CapFac_{JP}* is the Japanese intermediary capital ratio factor. See the text for additional details on the factors. Coefficients are the price of risk estimates. GMM *t*-statistics are reported. Intercept is included in each regression but omitted from the table. Ann. Risk Premium ($\sigma^\beta \times \lambda$) is the annualized increase in expected risk premium associated with a one standard deviation increase in the beta to the intermediary factor. TS GRS *p*-value is the *p*-value of the Gibbons–Ross–Shanken test of whether the pricing errors are jointly zero. MAPE is the mean absolute pricing error. TS Avg *R*² is the average time-series *R*².

Prices of Risk: $\mathbb{E}[R_{i,t}^c] = \lambda_0 + \hat{\beta}_{i,f}'\lambda_f$										
Panel A: $LevFac_{predicted}$										
	25 Size-and-B/M Portfolios						25 Size-and-B/M + 10 Mom Portfolios			
	Zombies		Non-zombies		Fama–French		Zombies		Non-zombies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$LevFac_{predicted}$	1.365 (1.96)	1.372 (2.02)	0.630 (0.76)	0.589 (0.79)	1.340 (2.06)	1.323 (1.95)	1.493 (1.99)	1.506 (2.14)	0.834 (1.05)	0.820 (1.06)
$Mkt - R_f$		−0.780 (−0.46)		0.064 (0.03)		−0.670 (−0.30)		−0.823 (−0.47)		−0.284 (−0.13)
Ann. Risk Premium	1.91	1.83	1.47	1.47	2.14	2.30	2.09	1.98	1.90	1.96
TS GRS p -value	0.23	0.33	0.11	0.12	0.35	0.53	0.50	0.62	0.58	0.65
MAPE (%)	3.05	0.74	3.26	1.37	2.77	0.57	3.03	0.68	3.22	1.15
TS Avg R^2	0.02	0.70	0.03	0.55	0.01	0.79	0.02	0.71	0.03	0.57
Quarters (T)	65	65	50	50	65	65	65	65	50	50
Portfolios (N)	25	25	25	25	25	25	35	35	35	35
Panel B: $LevFac_{residual}$										
	25 Size-and-B/M Portfolios						25 Size-and-B/M + 10 Mom Portfolios			
	Zombies		Non-zombies		Fama–French		Zombies		Non-zombies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$LevFac_{residual}$	7.781 (1.69)	8.909 (1.78)	7.920 (1.31)	6.879 (1.24)	9.320 (1.60)	9.906 (1.50)	7.068 (1.69)	7.692 (1.79)	7.278 (1.25)	6.924 (1.32)
$Mkt - R_f$		−0.749 (−0.49)		0.757 (0.25)		0.113 (0.05)		−0.943 (−0.60)		0.225 (0.10)
Ann. Risk Premium	1.62	1.84	1.80	2.00	1.42	1.98	1.56	1.67	1.63	1.93
TS GRS p -value	0.24	0.24	0.57	0.61	0.08	0.13	0.33	0.30	0.82	0.88
MAPE (%)	2.18	0.87	2.60	1.21	2.42	0.84	1.96	0.77	2.37	1.00
TS Avg R^2	0.18	0.71	0.12	0.55	0.18	0.79	0.19	0.71	0.13	0.57
Quarters (T)	65	65	50	50	65	65	65	65	50	50
Portfolios (N)	25	25	25	25	25	25	35	35	35	35
Panel C: $LevFac_{predicted}$ and $LevFac_{residual}$										
	25 Size-and-B/M Portfolios						25 Size-and-B/M + 10 Mom Portfolios			
	Zombies		Non-zombies		Fama–French		Zombies		Non-zombies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$LevFac_{predicted}$	1.070 (1.64)	0.914 (1.34)	0.401 (0.54)	−0.039 (−0.06)	1.242 (1.76)	0.861 (1.05)	1.396 (2.10)	1.337 (1.90)	0.658 (1.01)	0.450 (0.80)
$LevFac_{residual}$	2.909 (0.53)	4.141 (0.69)	6.421 (1.09)	6.576 (1.10)	1.743 (0.29)	3.922 (0.69)	0.871 (0.16)	1.317 (0.22)	4.672 (0.87)	4.899 (0.95)
$Mkt - R_f$		−0.629 (−0.39)		0.624 (0.23)		−0.528 (−0.24)		−0.743 (−0.43)		−0.138 (−0.07)
TS GRS p -value	0.19	0.38	0.12	0.18	0.35	0.62	0.43	0.65	0.62	0.75
MAPE (%)	3.05	0.72	3.39	1.30	2.77	0.67	3.03	0.69	3.36	1.09
TS Avg R^2	0.20	0.72	0.15	0.57	0.19	0.81	0.22	0.72	0.16	0.59
Quarters (T)	65	65	50	50	65	65	65	65	50	50
Portfolios (N)	25	25	25	25	25	25	35	35	35	35

Table A.2: Intermediary Asset Pricing with Components of $LevFac_{JP}$. Table presents the cross-sectional pricing results for 25 size-and-book-to-market and 10 momentum quarterly portfolios. 35 zombie portfolios, 35 non-zombie portfolios, and 25 Fama–French portfolios are used. The regressions test if the components of $LevFac_{JP}$, the Japanese intermediary leverage factor, price the portfolios. Portfolio construction, variable definitions, and test statistics are as in Table A.1.

Prices of Risk: $\mathbb{E}[R_{i,t}^e] = \lambda_0 + \hat{\beta}'_{i,f} \lambda_f$										
Panel A: $CapFac_{predicted}$										
	25 Size-and-B/M Portfolios						25 Size-and-B/M + 10 Mom Portfolios			
	Zombies		Non-zombies		Fama–French		Zombies		Non-zombies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$CapFac_{predicted}$	−2.735 (−1.96)	−2.749 (−2.02)	−1.262 (−0.76)	−1.180 (−0.79)	−2.684 (−2.06)	−2.649 (−1.95)	−2.990 (−1.99)	−3.018 (−2.14)	−1.671 (−1.05)	−1.643 (−1.06)
$Mkt - R_f$		−0.780 (−0.46)		0.064 (0.03)		−0.670 (−0.30)		−0.823 (−0.47)		−0.284 (−0.13)
Ann. Risk Premium	−1.88	−1.81	−1.45	−1.45	−2.11	−2.26	−2.05	−1.95	−1.88	−1.93
TS GRS p -value	0.23	0.31	0.18	0.19	0.26	0.41	0.48	0.57	0.68	0.74
MAPE (%)	2.83	0.73	2.97	1.32	2.68	0.51	2.76	0.67	2.88	1.08
TS Avg R^2	0.02	0.70	0.03	0.55	0.01	0.79	0.02	0.71	0.03	0.57
Quarters (T)	65	65	50	50	65	65	65	65	50	50
Portfolios (N)	25	25	25	25	25	25	35	35	35	35
Panel B: $CapFac_{residual}$										
	25 Size-and-B/M Portfolios						25 Size-and-B/M + 10 Mom Portfolios			
	Zombies		Non-zombies		Fama–French		Zombies		Non-zombies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$CapFac_{residual}$	−7.487 (−1.99)	−9.234 (−1.85)	−3.520 (−0.87)	−2.616 (−0.74)	−5.221 (−1.00)	−11.030 (−1.11)	−6.121 (−1.87)	−7.455 (−1.76)	−2.942 (−0.78)	−2.466 (−0.74)
$Mkt - R_f$		−1.000 (−0.59)		0.124 (0.05)		0.414 (0.15)		−0.962 (−0.63)		−0.149 (−0.07)
Ann. Risk Premium	−1.88	−2.13	−1.38	−1.47	−0.87	−1.77	−1.61	−1.68	−1.18	−1.35
TS GRS p -value	0.23	0.22	0.61	0.70	0.09	0.15	0.33	0.32	0.77	0.86
MAPE (%)	2.18	0.89	2.55	1.24	2.42	0.89	1.96	0.78	2.32	1.02
TS Avg R^2	0.15	0.70	0.13	0.55	0.15	0.78	0.15	0.71	0.14	0.57
Quarters (T)	65	65	50	50	65	65	65	65	50	50
Portfolios (N)	25	25	25	25	25	25	35	35	35	35
Panel C: $CapFac_{predicted}$ and $CapFac_{residual}$										
	25 Size-and-B/M Portfolios						25 Size-and-B/M + 10 Mom Portfolios			
	Zombies		Non-zombies		Fama–French		Zombies		Non-zombies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$CapFac_{predicted}$	−1.839 (−1.51)	−1.752 (−1.38)	−0.857 (−0.59)	−0.615 (−0.51)	−2.696 (−1.84)	−2.403 (−1.54)	−2.436 (−1.97)	−2.330 (−1.85)	−1.495 (−1.13)	−1.406 (−1.10)
$CapFac_{residual}$	−5.026 (−1.44)	−6.788 (−1.49)	−2.139 (−0.63)	−1.754 (−0.51)	0.138 (0.02)	−1.052 (−0.17)	−2.664 (−0.79)	−4.110 (−0.98)	−1.013 (−0.29)	−0.805 (−0.25)
$Mkt - R_f$		−0.643 (−0.40)		−0.153 (−0.06)		−0.608 (−0.28)		−0.511 (−0.32)		−0.403 (−0.19)
TS GRS p -value	0.24	0.39	0.10	0.17	0.24	0.45	0.43	0.61	0.41	0.57
MAPE (%)	2.83	0.68	3.14	1.29	2.68	0.52	2.76	0.64	3.05	1.06
TS Avg R^2	0.16	0.71	0.16	0.57	0.16	0.80	0.17	0.71	0.18	0.59
Quarters (T)	65	65	50	50	65	65	65	65	50	50
Portfolios (N)	25	25	25	25	25	25	35	35	35	35

Table A.3: Intermediary Asset Pricing with Components of $CapFac_{JP}$. Table presents the cross-sectional pricing results for 25 size-and-book-to-market and 10 momentum quarterly portfolios. 35 zombie portfolios, 35 non-zombie portfolios, and 25 Fama–French portfolios are used. The regressions test if the components of $CapFac_{JP}$, the Japanese intermediary capital ratio factor, price the portfolios. Portfolio construction, variable definitions, and test statistics are as in Table A.1.

Prices of Risk: $\mathbb{E}[R_{i,t}^c] = \lambda_0 + \beta'_{i,f} \lambda_f$												
Panel A: <i>LevFac_{JP}</i>												
Bank Dependence Measure	External Finance				Bank Beta				Long-Term Issuer			
	Bank-Dependent		Not Bank-Dep.		Bank-Dependent		Not Bank-Dep.		Bank-Dependent		Not Bank-Dep.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>LevFac_{JP}</i>	11.787 (2.43)	12.150 (2.59)	3.622 (0.82)	4.624 (1.08)	9.017 (2.16)	12.233 (2.70)	4.453 (1.09)	5.526 (1.27)	14.209 (2.83)	10.676 (2.00)	0.836 (0.22)	1.401 (0.38)
<i>Mkt</i> − <i>R_f</i>		−2.110 (−1.12)		0.451 (0.22)		2.032 (0.82)		−0.040 (−0.02)		−5.218 (−2.63)		0.160 (0.09)
Ann. Risk Premium	3.02	2.94	0.77	0.96	2.32	2.86	0.89	1.03	3.08	1.93	0.26	0.34
TS GRS <i>p</i> -value	0.16	0.18	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01
MAPE (%)	1.96	1.00	2.33	1.24	2.34	1.25	2.35	1.13	2.13	1.27	2.24	1.34
TS Avg <i>R</i> ²	0.20	0.65	0.12	0.62	0.19	0.63	0.09	0.59	0.11	0.68	0.15	0.60
Quarters (<i>T</i>)	68	68	73	73	79	79	75	75	75	75	79	79
Portfolios (<i>N</i>)	35	35	35	35	35	35	35	35	35	35	35	35
Panel B: <i>CapFac_{JP}</i>												
Bank Dependence Measure	External Finance				Bank Beta				Long-Term Issuer			
	Bank-Dependent		Not Bank-Dep.		Bank-Dependent		Not Bank-Dep.		Bank-Dependent		Not Bank-Dep.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>CapFac_{JP}</i>	−7.459 (−1.44)	−7.523 (−1.40)	−12.769 (−2.06)	−12.776 (−2.08)	−9.645 (−1.96)	−9.797 (−1.91)	−9.204 (−1.58)	−9.143 (−1.60)	−10.011 (−2.31)	−9.178 (−2.16)	−7.955 (−1.71)	−7.502 (−1.52)
<i>Mkt</i> − <i>R_f</i>		−1.941 (−0.84)		−3.734 (−2.11)		−1.834 (−0.82)		−2.445 (−1.24)		−4.153 (−1.83)		−2.876 (−2.03)
Ann. Risk Premium	−2.54	−2.56	−3.53	−4.07	−3.50	−3.71	−2.62	−3.19	−3.87	−3.38	−2.80	−2.46
TS GRS <i>p</i> -value	0.32	0.53	0.02	0.04	0.15	0.20	0.05	0.08	0.08	0.15	0.34	0.55
MAPE (%)	2.37	0.88	2.55	0.97	2.73	0.91	2.33	0.93	2.37	1.10	2.45	1.03
TS Avg <i>R</i> ²	0.23	0.66	0.12	0.62	0.24	0.66	0.11	0.57	0.14	0.63	0.16	0.60
Quarters (<i>T</i>)	55	55	53	53	55	55	55	55	53	53	55	55
Portfolios (<i>N</i>)	35	35	35	35	35	35	35	35	35	35	35	35

Table A.4: Intermediary Asset Pricing of Bank-Dependent Portfolios. Table presents the cross-sectional pricing results for quarterly portfolios: 25 size-and-book-to-market bank-dependent portfolios and 10 momentum bank-dependent portfolios. Firms are classified as bank dependent using three bank dependence measures separately, and bank-dependent portfolios are formed of bank-dependent firms. Not bank-dependent portfolios are formed using the other firms. See the text for additional details on the bank dependence measures and portfolio construction. The regressions test if a Japanese intermediary factor prices the portfolios. Portfolio construction, variable definitions, and test statistics are as in Table A.1.

Prices of Risk: $\mathbb{E}[R_{i,t}^e] = \lambda_0 + \hat{\beta}'_{i,f} \lambda_f$						
Panel A: $LevFac_{predicted}$						
Bank Dependence Measure	External Finance		Bank Beta		Long-Term Issuer	
	(1)	(2)	(3)	(4)	(5)	(6)
$LevFac_{predicted}$	1.409 (1.62)	0.805 (1.42)	0.737 (1.21)	0.040 (0.07)	1.636 (1.83)	0.732 (0.84)
$Mkt - R_f$		-3.376 (-1.38)		-4.642 (-3.32)		-7.172 (-2.77)
Ann. Risk Premium	2.03	1.02	1.45	0.07	2.76	1.16
TS GRS p -value	0.76	0.76	0.01	0.03	0.09	0.15
MAPE (%)	3.12	1.01	3.42	1.11	2.65	1.07
TS Avg R^2	0.03	0.66	0.03	0.65	0.02	0.65
Panel B: $LevFac_{residual}$						
Bank Dependence Measure	External Finance		Bank Beta		Long-Term Issuer	
	(1)	(2)	(3)	(4)	(5)	(6)
$LevFac_{residual}$	10.529 (2.22)	10.415 (2.22)	11.376 (2.42)	13.006 (2.69)	14.320 (2.76)	10.826 (1.63)
$Mkt - R_f$		-2.583 (-1.40)		-0.664 (-0.35)		-7.734 (-2.56)
Ann. Risk Premium	2.49	2.30	2.98	3.04	3.32	2.31
TS GRS p -value	0.28	0.31	0.02	0.01	0.06	0.09
MAPE (%)	1.88	0.98	2.11	0.99	2.19	1.23
TS Avg R^2	0.22	0.66	0.24	0.65	0.13	0.65
Panel C: $LevFac_{predicted}$ and $LevFac_{residual}$						
Bank Dependence Measure	External Finance		Bank Beta		Long-Term Issuer	
	(1)	(2)	(3)	(4)	(5)	(6)
$LevFac_{predicted}$	0.170 (0.33)	0.168 (0.33)	-0.666 (-1.15)	-0.674 (-1.16)	0.539 (0.84)	0.829 (0.91)
$LevFac_{residual}$	9.725 (1.88)	9.706 (1.89)	14.957 (3.76)	15.618 (3.62)	11.570 (2.43)	8.194 (1.63)
$Mkt - R_f$		-2.431 (-1.26)		-1.470 (-0.93)		-7.412 (-2.51)
TS GRS p -value	0.66	0.79	0.01	0.02	0.07	0.16
MAPE (%)	3.12	1.01	3.42	1.09	2.76	1.04
TS Avg R^2	0.24	0.67	0.27	0.66	0.15	0.66
Quarters (T)	65	65	65	65	63	63
Portfolios (N)	35	35	35	35	35	35

Table A.5: Intermediary Asset Pricing of Bank-Dependent Portfolios with Components of $LevFac_{JP}$. Table presents the cross-sectional pricing results for quarterly portfolios: 25 size-and-book-to-market bank-dependent portfolios and 10 momentum bank-dependent portfolios. Firms are classified as bank dependent using three bank dependence measures separately, and bank-dependent portfolios are formed of bank-dependent firms. The regressions test if the components of $LevFac_{JP}$ price the portfolios. Portfolio construction, variable definitions, and test statistics are as in Table 2.

Prices of Risk: $E[R_{i,t}^e] = \lambda_0 + \hat{\beta}'_{i,f} \lambda_f$						
Panel A: $CapFac_{predicted}$						
Bank Dependence Measure	External Finance		Bank Beta		Long-Term Issuer	
$CapFac_{predicted}$	-2.823 (-1.62)	-1.613 (-1.42)	-1.476 (-1.21)	-0.081 (-0.07)	-3.277 (-1.83)	-1.467 (-0.84)
$Mkt - R_f$		-3.376 (-1.38)		-4.642 (-3.32)		-7.172 (-2.77)
Ann. Risk Premium	-2.00	-1.01	-1.44	-0.07	-2.71	-1.15
TS GRS p -value	0.67	0.68	0.01	0.02	0.07	0.11
MAPE (%)	2.78	1.00	3.06	1.05	2.50	1.09
TS Avg R^2	0.03	0.66	0.03	0.65	0.02	0.65
Panel B: $CapFac_{residual}$						
Bank Dependence Measure	External Finance		Bank Beta		Long-Term Issuer	
$CapFac_{residual}$	-7.965 (-1.69)	-7.868 (-1.67)	-10.360 (-2.37)	-11.787 (-2.26)	-10.177 (-2.60)	-8.326 (-2.23)
$Mkt - R_f$		-2.636 (-1.16)		-1.005 (-0.31)		-6.150 (-1.99)
Ann. Risk Premium	-2.70	-2.56	-3.56	-3.66	-3.65	-2.72
TS GRS p -value	0.23	0.27	0.02	0.01	0.05	0.07
MAPE (%)	1.88	1.00	2.11	1.00	2.16	1.25
TS Avg R^2	0.18	0.66	0.19	0.65	0.12	0.65
Panel C: $CapFac_{predicted}$ and $CapFac_{residual}$						
Bank Dependence Measure	External Finance		Bank Beta		Long-Term Issuer	
$CapFac_{predicted}$	-0.914 (-0.74)	-1.094 (-0.87)	0.840 (0.52)	0.482 (0.34)	-1.261 (-0.97)	-1.169 (-0.75)
$CapFac_{residual}$	-6.855 (-1.44)	-6.784 (-1.41)	-11.675 (-3.00)	-11.984 (-2.63)	-8.566 (-2.62)	-7.555 (-2.27)
$Mkt - R_f$		-1.757 (-0.87)		-1.213 (-0.51)		-5.553 (-2.12)
TS GRS p -value	0.61	0.69	0.02	0.03	0.08	0.14
MAPE (%)	2.78	0.96	3.06	1.00	2.58	1.04
TS Avg R^2	0.21	0.67	0.22	0.66	0.14	0.66
Quarters (T)	65	65	65	65	63	63
Portfolios (N)	35	35	35	35	35	35

Table A.6: Intermediary Asset Pricing of Bank-Dependent Portfolios with Components of $CapFac_{JP}$. Table presents the cross-sectional pricing results for quarterly portfolios: 25 size-and-book-to-market bank-dependent portfolios and 10 momentum bank-dependent portfolios. Firms are classified as bank dependent using three bank dependence measures separately, and bank-dependent portfolios are formed of bank-dependent firms. The regressions test if the components of $CapFac_{JP}$ price the portfolios. Portfolio construction, variable definitions, and test statistics are as in Table 2.

	News-Implied Volatility Indexes				Risk 1A Long-Short Portfolio Returns				
	(1) <i>GovFac</i>	(2) <i>GovFac</i>	(3) <i>GovFac</i>	(4) <i>GovFac</i>	(5) <i>GovFac</i>	(6) <i>GovFac</i>	(7) <i>GovFac</i>	(8) <i>GovFac</i>	(9) <i>GovFac</i>
$-1 \times NVIX$	0.049*** (9.00)								
$-1 \times \text{Government}$		0.788*** (6.97)							
$-1 \times \text{Intermediation}$			0.284*** (6.92)						
$-1 \times \text{Stock Markets}$				0.361*** (6.26)					
Taxes					0.012* (2.09)				
Regulations						0.013* (2.13)			
Economic Conditions							0.014* (2.32)		
Bank Regulations								0.011 (1.70)	
Credit Market									0.011 (1.69)
Constant	1.514*** (11.06)	0.768*** (8.57)	0.670*** (9.42)	0.871*** (7.96)	0.120** (3.34)	0.120*** (3.37)	0.119** (3.35)	0.125*** (3.52)	0.123*** (3.41)
<i>N</i>	147	147	147	147	160	160	160	160	160
Adj. R^2	0.53	0.22	0.32	0.22	0.02	0.02	0.02	0.01	0.01

Table A.7: Correlation of the U.S. Sovereign Risk Factor with Other Sovereign Risk Measures. Table presents time-series regressions at the monthly level. The dependent variable is the sovereign risk factor. The independent variables are other sovereign risk measures, including news-implied volatility indexes from Manela and Moreira (2017) and Risk 1A long-short portfolio returns from Ross (2019). t -statistics using robust standard errors are reported in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Sample	All Commercial Banks					Top 50 Commercial Banks				
	(1) Return	(2) Return	(3) Return	(4) Return	(5) Return	(6) Return	(7) Return	(8) Return	(9) Return	(10) Return
$GovFac_{synthetic}$	0.007*** (4.52)	0.006*** (3.67)	0.008*** (4.88)	0.017*** (9.97)	0.018*** (10.41)	0.012*** (3.98)	0.008* (2.28)	0.009* (2.56)	0.016*** (4.51)	0.017*** (4.73)
$GovFac_{synthetic} \times \mathbb{I}(\text{WSJ})$		0.022*** (3.74)	0.021*** (3.53)	0.007 (1.04)	0.007 (0.99)		0.020** (2.97)	0.019** (2.93)	0.007 (0.94)	0.007 (0.92)
$GovFac_{synthetic} \times \mathbb{I}(\text{Post})$				-0.024*** (-6.53)	-0.021*** (-5.80)				-0.028** (-2.97)	-0.028** (-2.88)
$GovFac_{synthetic} \times \mathbb{I}(\text{WSJ}) \times \mathbb{I}(\text{Post})$				0.041*** (3.36)	0.040** (3.26)				0.047** (3.10)	0.047** (3.10)
Constant	0.072*** (46.70)	0.072*** (46.72)	-0.033 (-0.24)	0.073*** (46.91)	-0.033 (-0.25)	0.051*** (16.54)	0.051*** (16.55)	-0.045 (-0.38)	0.051*** (16.56)	-0.045 (-0.38)
N	3,935,268	3,935,268	3,935,268	3,935,268	3,935,268	598,452	598,452	598,452	598,452	598,452
Adj. R^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
SIC FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes

Table A.8: Beta of U.S. Commercial Banks to the Synthetic U.S. Sovereign Risk Factor. Table presents time-series regressions run at the daily level. The dependent variable is firm i 's return in percent. Independent variables are the synthetic U.S. sovereign risk factor, $GovFac_{synthetic}$, and the factor interacted with indicator variables. See the text for additional details on $GovFac_{synthetic}$. $\mathbb{I}(\text{WSJ}) = 1$ if the bank is one of the 11 banks cited as too big to fail by *The WSJ*, and 0 otherwise. $\mathbb{I}(\text{Post}) = 1$ if the date is after September 20, 1984, and 0 otherwise. t -statistics using robust standard errors are reported in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Treatment Group	Big Three					Autos				
	(1) Return	(2) Return	(3) Return	(4) Return	(5) Return	(6) Return	(7) Return	(8) Return	(9) Return	(10) Return
<i>GovFac</i>	0.686*** (66.33)	0.686*** (66.28)	0.869*** (72.39)	0.126*** (7.10)	0.135*** (4.63)	0.686*** (66.33)	0.685*** (66.09)	0.868*** (72.22)	0.125*** (7.07)	0.135*** (4.62)
<i>GovFac</i> $\times$ $\mathbb{I}(\text{Treated})$		0.655* (2.08)	0.645* (2.00)	-0.074 (-0.16)	-0.158 (-0.33)		0.499** (3.13)	0.507** (2.93)	0.145 (0.66)	0.060 (0.21)
<i>GovFac</i> $\times$ $\mathbb{I}(\text{Post})$				0.926*** (41.57)	0.946*** (29.60)				0.925*** (41.47)	0.944*** (29.53)
<i>GovFac</i> $\times$ $\mathbb{I}(\text{Treated}) \times \mathbb{I}(\text{Post})$				1.521* (2.36)	1.613* (2.45)				0.647* (2.03)	0.735 (1.94)
Constant	0.036*** (39.55)	0.036*** (39.55)	0.054** (2.68)	0.050*** (48.17)	0.109*** (5.44)	0.036*** (39.55)	0.036*** (39.55)	0.054** (2.68)	0.050*** (48.17)	0.109*** (5.44)
<i>N</i>	20,042,168	20,042,168	20,042,168	20,042,168	20,042,168	20,042,168	20,042,168	20,042,168	20,042,168	20,042,168
Adj. <i>R</i> ²	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
SIC FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes

Table A.9: Beta of U.S. Auto Companies to the U.S. Sovereign Risk Factor. Table presents time-series regressions at the daily level. The dependent variable is return in percent. Independent variables are the U.S. sovereign risk factor, *GovFac*, and the factor interacted with indicator variables. See the text for additional details on *GovFac*. In columns 1 to 5, $\mathbb{I}(\text{Treated}) = 1$ if the firm is one of the Big Three automakers, and 0 otherwise. In columns 6 to 10, $\mathbb{I}(\text{Treated}) = 1$ if the firm is an automaker, and 0 otherwise. $\mathbb{I}(\text{Post}) = 1$ if the date is after December 19, 2008, and 0 otherwise. *t*-statistics using robust standard errors are reported in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

	(1)	(2)	(3)	(4)
	β_{GovFac}	β_{GovFac}	β_{GovFac}	β_{GovFac}
Fitch Bank Support Rating	−0.012 (−1.95)	−0.003*** (−5.03)	−0.008** (−3.32)	−0.003*** (−5.00)
Constant	0.060* (2.00)	0.005*** (4.15)	0.042*** (3.72)	0.005*** (4.13)
N	111	111	105	105
Adj. R^2	0.02	−0.18	0.09	0.50
Country FE	No	Yes	No	Yes
Incl. Saudi Arabia	Yes	Yes	No	No

Table A.10: Bank Sovereign Risk Betas and Fitch Support Ratings. Table presents cross-sectional regressions at the bank level. The dependent variable is the bank's beta to its home country's sovereign risk factor, estimated by regressing the bank's daily return on the one-day lag of the country's sovereign risk factor. The independent variable is the bank's Fitch support rating, which ranges from 1 (extremely high probability of external support) to 5 (support cannot be relied upon). Banks are members of the Bloomberg Banks Index with a Fitch support rating. t -statistics using robust standard errors are reported in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Appendix Figures

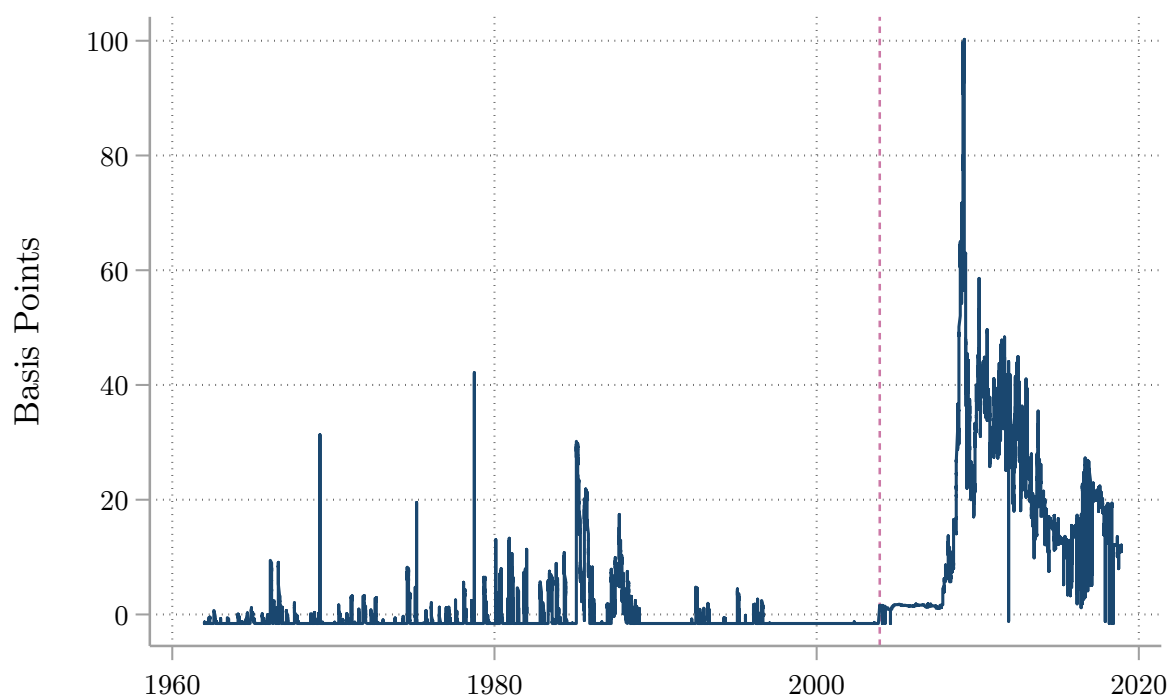


Figure A.1: Synthetic U.S. Sovereign CDS Spread. Figure shows the par-equivalent CDS spread, demeaned and scaled, and spliced with the U.S. sovereign CDS spread. See Appendix B for details on the construction.

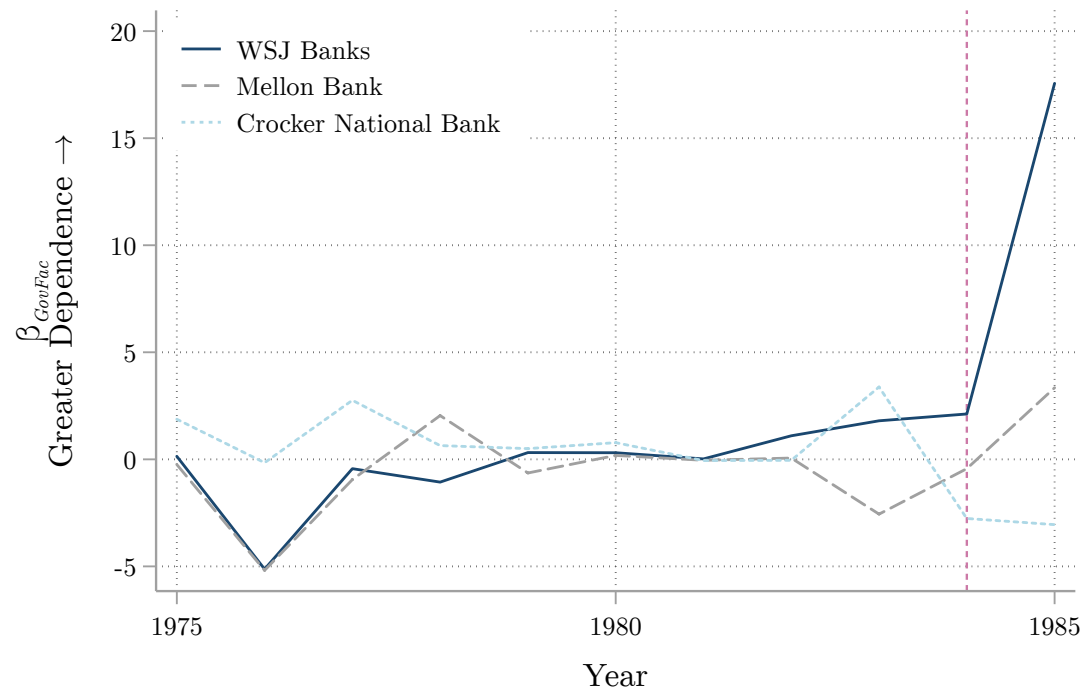


Figure A.2: Beta to Synthetic U.S. Sovereign Risk Factor. Figure shows the average beta to the synthetic U.S. sovereign risk factor for the 11 largest banks cited by the *WSJ* and the beta for the next largest banks, Mellon Bank and Crocker National Bank. Betas are calculated monthly and averaged to the annual level. Vertical line marks 1984, the year of the too big to fail event.

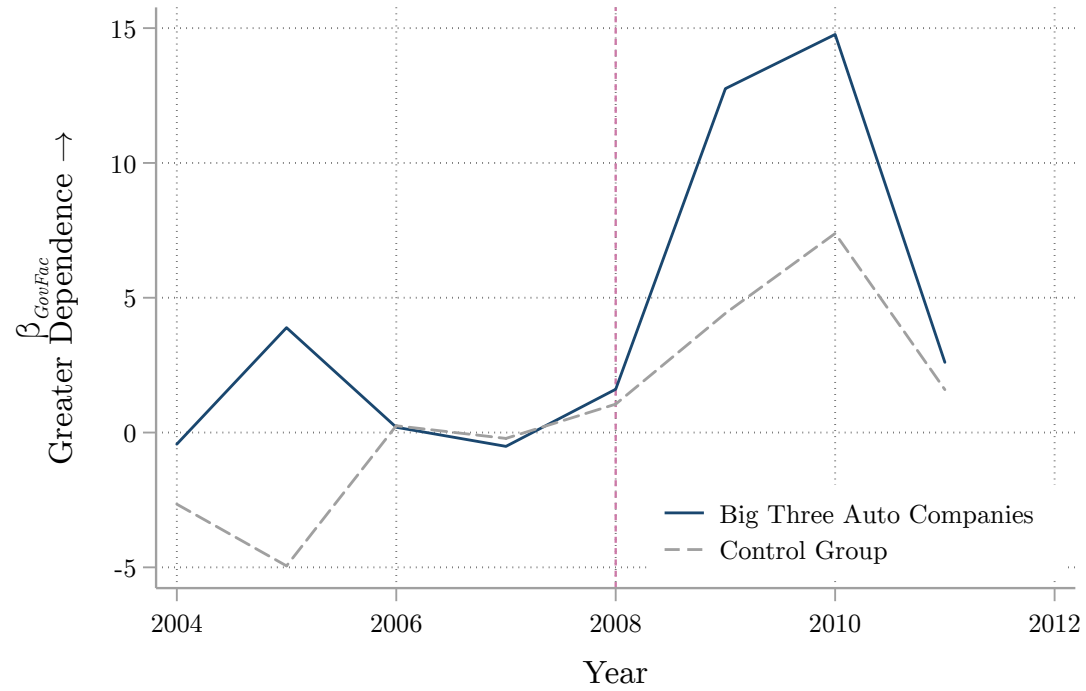


Figure A.3: Beta to U.S. Sovereign Risk Factor. Figure shows the average beta to the U.S. sovereign risk factor for the Big Three automakers and a control group of non-bank, non-autos. Betas are calculated monthly and averaged to the annual level. Vertical line marks 2008, the year of the Global Financial Crisis auto bailout.