Investing in Crises

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Abstract:
We investigate asset returns around banking crises in 44 advanced and emerging economies from 1960 to 2016. In contrast to the view that buying assets during banking crises is a profitable long-run strategy, we find returns of equity and other asset classes often underperform after banking crises. While prices are depressed during crises and partially recover after acute stress ends, consistent with theories of fire sales and intermediary-based asset pricing, we argue that investors do not fully anticipate the persistent real effects of crises, which result in lower long-run dividends. Our results on bank stock underperformance suggest that government-funded bank recapitalizations can often lead to substantial taxpayer losses.

Keywords: investments, financial crises, returns, fire sales
JEL Codes: G11; G14; G15; G41

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Do financial crises offer profitable opportunities for long-term investors? A common view among both academics and market participants is that financial crises are times when assets can be bought at deep discounts, yielding potentially high long-run profits. Consistent with this view, intermediary asset pricing models (e.g., He and Krishnamurthy 2013, Brunnermeier and Sannikov 2014) predict elevated risk premia when the borrowing constraints of leveraged investors become binding. Similarly, in models of fire sales, asset prices can be sharply depressed when the market is hit by large aggregate shocks and investors are liquidity constrained, allowing unconstrained investors to enjoy excess returns by providing liquidity to the market (Shleifer and Vishny 1992, 1997, Stein 1995, Brunnermeier and Pedersen 2009). On the empirical side, Muir (2017) finds that asset prices collapse and credit spreads increase during financial crises. However, little is known about the longer-term asset returns after crises or the returns to investing specifically in the banking sector.

In this paper, we analyze asset returns following banking crises in an international panel of monthly returns across several asset classes, covering 44 countries over the period 1960-2016. We define the "acute phase" of banking crises using five alternative approaches to which our results are generally invariant. The first two approaches are the first months of: (1) systemwide "banking panics" from Baron, Verner, and Xiong (2021, hereafter "BVX"), and (2) multiple major government interventions from Laeven and Valencia (2020, hereafter "LV"). We add three more alternative definitions of banking distress based strictly on quantitative indicators that are observable in real time: (3) a >30% year-over-year decline in a country's bank equity index; (4) an increase in interbank lending spreads of >2% in a month; and (5) central bank liquidity provision first exceeding 5% of aggregate bank deposits.

We first find that if one invests during the acute phase of banking crises, long-run equity returns of both banks and nonfinancial firms are not substantially elevated, whether measured in local currency units (LCU) or U.S. dollars (USD), in excess returns or real returns. Furthermore, we show that there is high risk to investing during crises, as indicated by the variance of investment outcomes across crises and the frequency of double-dip crises, giving rise to large tail risks. Similar results hold for other asset classes, including real estate, currencies, and emerging market sovereign debt. However, we do not find such results for other types of crises, including currency crises, consumption drops, and stock crashes.

We then study trading strategies in which a U.S.-based investor invests in banking crises around the world when they occur and in U.S. T-bills otherwise. Such strategies, whether for stocks or other asset classes, do not tend to beat an international passive benchmark in absolute performance or on a risk-adjusted basis—and for bank stocks, they consistently produce negative alpha. Even if investors have particularly good timing to buy at the point where prices on average reach a trough (which tends to occur six months after the start of the acute phase), we show returns of such strategies are elevated at most a few percentage points for nonfinancials and still underperform for bank equity. Taken together, our results imply that the conventional wisdom that it pays to take advantage of the fear or borrowing constraints of others by investing during times of severe financial distress may not always be true.

We next find that banking crises, from a long-run perspective, can be viewed primarily as equity cash-flow shocks rather than discount rate shocks. This finding helps distinguish between two views of why equity prices collapse in crises. One view is that prices collapse due to real damage to the economy, which leads to lower dividends (a cash-flow effect). In this view, the fall in equity prices is "permanent." The alternative view, encapsulated by models of fire sales and intermediary asset pricing, is that depressed prices are largely driven by leverage constraints or illiquidity, and that prices mostly bounce back once the acute stress is over and discount rates normalize.

Our evidence suggests that for equities, the first view is relatively more important. While there is a bounceback in prices, consistent with intermediary asset pricing, it is relatively small compared to the initial decline. Moreover, we find that the collapse in prices at the time of the crisis is followed by a future fall in dividends—a cash-flow effect—rather than higher future long-run returns. Consistent with Muir (2017), we find that price-dividend ratios are temporarily low during banking crises, as equity prices suddenly fall at the onset of the crisis, while dividends are sticky in the short-run. However, the price-dividend ratio then adjusts not because prices rebound (a discount rate effect, as conjectured by Muir 2017), but because banking crises systematically feature a fall in future dividends.

Why do the long-run returns to investing in banking crises tend not to be elevated? One hypothesis is simply that equity discount rates stay constant during banking crises and investors correctly anticipate the future fall in dividends. An alternative hypothesis is that discount rates do increase during the acute phase of the crisis, consistent with intermediary asset pricing, but that equity investors do not fully anticipate the long-run decline in dividends. We present two pieces of evidence in support of the second hypothesis.

First, we find that in the acute phase of the crisis, investors do not immediately price in the full severity of the crisis. Future excess returns are predictably negative in the six months following the acute phase of the crisis (-24% for nonfinancial equity, -47% for bank equity after BVX crises). Thus, even in the severe phase of a crisis, investors do not fully anticipate that the crisis will tend to considerably worsen.[1] This predictability or downward momentum is not due to a look-ahead bias in narrative crisis dates, as similar negative returns are often observed after the real-time, quantitative indicators of crises. Thus, even though equity prices fall substantially leading up to the acute phase of the crisis, this fall is not enough to make long-run future returns elevated.

Second, we show that measures of debt overhang at the time of the crisis predict both lower future returns and dividends at longer horizons of five years. Consequently, we argue

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[1] For example, in the U.S. in 2008, the start of the acute phase of the crisis is dated by BVX to the end of September 2008, just after the failure of Lehman Brothers, but the stock market did not hit its trough until February 2009.

that the long-run underperformance may be due to investors not fully anticipating the long-lasting macroeconomic consequences of debt overhang, which depresses long-run dividends. In contrast, macroeconomic indicators and fiscal policy at the time of the crisis do not predict stock market outcomes across crises, either because policy is endogenous to the severity of the crisis or because investors correctly anticipate the consequences of these policies.

Recent research has shown that banking crisis recessions tend to be unusually deep and persistent compared to noncrisis recessions, in large part due to balance sheet problems in the household and banking sectors (Mian and Sufi 2009, Reinhart and Rogoff 2009, Jordà, Schularick, and Taylor 2011).[2] Thus, one interpretation of this second finding, consistent with extensive survey evidence, is that investors underappreciate the persistence of debt problems and its long shadow on corporate and bank earnings, leading them to overestimate the speed of recovery. Investors may also neglect the probability of double-dip crises, which are common. This interpretation is consistent with evidence that macroeconomic forecasts were systematically too optimistic about the speed of recovery after the 2008 banking crises (e.g., Mian, Sufi, Verner 2017; Bordalo et al. 2020). We similarly show that IMF macroeconomic forecasts are generally overoptimistic in forecasting the speed of recovery after banking crises but not after other types of crises (noting that equity investors need not have the same expectations as IMF forecasters).

Our results imply that markets do not seem to overreact or be systematically too pessimistic during the depths of crises: if anything, investors on average are *not pessimistic enough* about the long-run effects of crises on future bank and corporate earnings. Behavioral

[2] It can often take more than a decade to fully clean up bad loans in the banking sector. Even nearly 10 years after the 2008 global financial crisis and the 2010-2012 euro-area sovereign debt crisis, banks in Cyprus, Greece, Ireland, Italy, and Portugal are still dealing with problem loans (Huljak et al. 2020). In Japan, banking problems after the 1990s banking crisis persisted through 2003 when the Japanese government had to undertake a third round of restructuring and nationalizing several major banks (Hoshi and Kashyap 2004). In the U.S. in the 1980s, problems related to the savings and loans crisis took nearly a decade to fully resolve (Kane 1989). Thus, it may be difficult for investor to fully appreciate ex-ante the long horizon of such problems.

theory suggests that investors could shy away from the market after experiencing losses during a banking crisis because they are more sensitive to losses than to gains (Benartzi and Thaler 1995) or because they form incorrect expectations based on overweighting past returns or experiences (Malmendier and Nagel 2011, Barberis et al. 2015) during extreme market distress. These forces might lead investors to be excessively pessimistic in the depths of the crisis and underweight the probability of recovery, causing prices to fall below fundamentals and risk premia to rise. Our results, in fact, suggest the opposite.

A substantial body of evidence has found that discount rates rise around banking crises. For example, Muir (2017) finds that banking crises are times when *ex-ante* measures of expected returns, such as credit spreads and dividend yields, are elevated.[3] Our evidence is not inconsistent with intermediary asset pricing, but rather we show that ex-ante measures of expected returns around crises do not necessarily forecast high realized returns in the long run.

Similarly, Baron and Muir (2021) find that over the sample 1870-2016, lower-than-average credit growth predicts elevated equity returns, consistent with intermediary asset pricing theory. However, it is important to note that they show that most of this predictability holds outside of banking crisis times and not during them (when high discount rates might be offset by expectational errors about the long-run fall in dividends), consistent with our results.[4]

While Muir (2017) mainly focuses on elevated *ex-ante* measures of expected returns, he does find, in contrast to us, that equity returns are elevated after crises, by analyzing an annual data set covering 14 advanced economies since 1870. We replicate his results and find that the difference is not driven by the sample of countries nor by the choice of data sets (annual

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[3] Other papers find pricing effects due to intermediary frictions in many other asset classes, including debt instruments (Krishnamurthy 2010, Gorton and Metrick 2012), credit default swaps (Siriwardane 2019, Eisfeldt, Herskovic, Rajan, and Siriwardane 2021), equity options (Garleanu, Pedersen, and Poteshman 2009), currencies (Du, Tepper, and Verdelhan 2018), and insurance products (Koijen and Yogo 2015).

[4] We similarly show in Appendix Table A.2 that only credit crunches outside of BVX crises predict higher future nonfinancial and bank equity returns.

crisis dates in his paper versus monthly in this paper). Instead, we find that his results are mainly driven by his inclusion of the 1870-1945 subsample. On the post-1945 subsample, his results are consistent with ours: an initial bounceback in prices after the crisis, followed by longer-run underperformance between years two and five. This difference between these subsamples is consistent with a debt overhang explanation. Before the Great Depression, banking crises were mostly temporary liquidity panics with little long-term macroeconomic consequences (Calomiris and Gorton 1991; Baron, Verner, and Xiong 2021). Thus, equity prices rebounded once liquidity was restored. In contrast, most post-1945 crises feature credit and real estate booms-gone-bust and large balance sheet losses to the banking and household sectors (Jordà, Schularick, and Taylor 2011), which we argue predict long-run equity underperformance.

Our results on the high risk and underperformance of bank stocks have several important implications. First, our results imply that taxpayer-funded bank recapitalizations are risky and, in many cases, can lead to substantial taxpayer losses. While the U.S. government's TARP investments in 2008 turned out to be profitable on an absolute return basis, this outcome is not generally true of bank equity returns in other countries, even when their governments also inject taxpayer money into banks.[5] For instance, the five-year subsequent real total return (in LCU) of the bank stock index were: -54.7% for Japan after its 1997-8 crisis and -34.8% for Germany and -20.8% for the U.K. after the 2007-8 crisis, even though governments recapitalized banks in all these countries. In contrast, Denmark, Norway, and Sweden saw very high stock returns after their 1990-92 banking crises, as did the U.S. after 2008, illustrating the wide variation in outcomes. While the investment return is obviously not the primary objective

[5] Flanagan and Purnanandam (2020) similarly argue that the commonly-held view that the TARP was an investment success is not true. They show that TARP investment returns to U.S. taxpayers were considerably lower than those of comparable private market securities on a risk-adjusted basis.

of a government recapitalization of the banking sector, our analysis helps understand some of the risks and potential losses associated with such interventions.

Second, our results may help explain why even deep-pocketed private investors tend to be hesitant to buy assets during banking crises, particularly when it concerns recapitalizing banks (Coates and Scharfstein 2009). Ideally, private investors might take over banks and restructure them during banking crises, obviating the need for taxpayer-funded recapitalizations. By showing that bank equity investments are highly volatile and not necessarily profitable after crises, our results provide one potential reason why private investors, especially those with experience investing in banks and thus best-positioned to understand the risks, often seem hesitant to do so.[6]

I. Data and summary statistics

We construct an unbalanced country-level monthly panel, covering 44 countries over the period 1960-2016, consisting of three types of variables: asset returns, crisis starting months, and macroeconomic variables. We discuss each type in turn below. The coverage of the entire panel consists of all country-month observations for which the bank equity total return, nonfinancial equity total return, inflation rate, short-term interest rate, and USD exchange rate are all non-missing.

[6] For example, Warren Buffett turned down LTCM in 1998 and Lehman and AIG in 2008 after being approached by these firms, and instead only invested $5 billion in preferred shares in Goldman Sachs, one of the strongest investment banks during the 2008 crisis. Similarly, J.C. Flowers and Co., a prominent private equity firm specializing in bank restructurings, passed over opportunities to invest in Bear Stearns and Northern Rock in 2007-8—though later made disastrous investments in MF Global and Germany's HSH Nordbank and Hypo Real Estate.

For a vivid example of the difficulties involved in private investors trying to restructure a major bank, see Tett's (2003) account of the takeover of Japan's Long-Term Credit Bank (LTCB) in 1999 by the American private equity groups Ripplewood Holdings and J.C. Flowers and Co. Although this deal was ultimately profitable at the time the bank went public again in a 2004 IPO, its success was anything but a foregone conclusion and was due, in large part, to a large (and controversial) implicit subsidy provided by the Japanese government, as argued by Tett (2003). However, in the years following the IPO, J.C. Flowers and Co. continued to hold a large stake in the bank that resulted eventually in large losses.

Our main data set covers the period 1960-2016 because, in contrast to earlier periods, monthly asset returns are consistently available during this period for most countries in our sample. At later points in the paper, we extend our analysis using the Jordà, Schularick, and Taylor (2011) data set covering 17 advanced economies with annual data since 1870. Also, for comparability with other studies, we split our data set into advanced versus developing countries, though our results are consistently similar across these two subsets of countries.

Asset returns. The two main asset classes we study are nonfinancial equity and bank equity, for which we build country-level monthly total return indexes. These monthly total return indexes are constructed with data from Datastream, Global Financial Data, and Baron, Verner, and Xiong (2021) who construct indexes using newly collected individual nonfinancial and bank stock data for each country. For details, see Appendix Table C.1, which lists all data sources by country. Total returns are decomposed into price return and dividend return components, and the sources for these components are also documented by country in Appendix Table C.1. For dividend returns, sometimes the data come only as annual series, in which case we allocate the cash value of the dividends equally over the 12 months of the year.

We also gather monthly total returns data on two other asset classes: EMBI sovereign bonds (only available for emerging market countries) and currencies (calculated as the carry trade returns from the perspective of a USD-based investor, using the USD and local short-term interest rates, along with the USD exchange rate). We also gather data on residential real estate price returns, though this variable is only available at the annual level. See Appendix Table C.1 for the sources for each variable by country.

For the subsequent analysis, returns are calculated in four different ways: LCU excess returns, LCU real returns, USD excess returns, and USD real returns. LCU excess returns and LCU real returns are calculated using each country's short-term interest rates and CPI-inflation rates, respectively. USD excess returns and USD real returns are calculated by first converting

LCU to USD returns using nominal exchange rates and then by subtracting the U.S. short-term interest rate or U.S. CPI-inflation rate, respectively.

Table 1 reports summary statistics for the returns of the five asset classes: nonfinancial and bank equity total returns, EMBI bond total returns, currency carry trade returns, and residential real estate price returns. Returns are reported both in LCU and in USD. The mean, standard deviation, and percentiles are calculated using monthly arithmetic returns (not annualized), except for residential real estate price returns, which are annual.

INSERT TABLE 1 HERE

Crisis dates. We use five alternative chronologies of the "acute phase" of banking crises. The first two are: the first months of (1) systemwide "banking panics" from BVX and (2) multiple major government interventions from LV. Among standard banking crisis chronologies, these two are chosen as they are based on precise criteria that investors can observe in real time.[7] BVX identify banking panics by first screening for annual observations in which the bank equity index has cumulatively dropped by 30% relative to its previous peak, then using narrative information and bank credit spreads to identify the month of the acute "panic" (i.e. widespread creditor runs) phase of the crisis.[8] In contrast, LV take a policy-based approach and define the starting month of the crisis as when at least three out of the six policy interventions are implemented.[9]

[7] See BVX, Baron and Dieckelmann (2021), and Sufi and Taylor (2021) for issues and potential biases with other standard banking crisis chronologies.

[8] Following Calomiris and Gorton (1991) and Gorton and Huang (2004), BVX define a banking panics as a "severe and sudden withdrawals of funding by bank creditors." Specifically, they define a banking panic "as an episode containing any of the following criteria appearing in narrative accounts: (i) severe and sudden depositor or creditor withdrawals at more than one of a country's largest banks or more than ten smaller banks, that lead these banks to be on the verge of collapse; (ii) severe and sudden strains in interbank lending markets; or (iii) severe and sudden foreign-currency capital outflows." BVX provide a database with systematic historical documentation for each episode regarding the presence of panics and the month in which the panic begins.

[9] The six policy measures are: "1) extensive liquidity support (5% of deposits and liabilities to nonresidents) 2) bank restructuring gross costs (at least 3% of GDP) 3) significant bank nationalizations 4) significant guarantees put in place 5) significant asset purchases (at least 5% of GDP) 6) deposit freezes and/or bank holidays."

We add three more alternative definitions of banking distress based strictly on quantitative indicators that investors can observe and trade on in real time. They are the first months of: (3) a >30% year-over-year decline in a country's bank equity index[10], which we call a "bank equity crash" following BVX; (4) a monthly increase in interbank lending spreads of >2% (first occurrence within a five-year period, using data from BVX); and (5) central bank liquidity provision exceeding 5% of aggregate banking system deposits (first occurrence within a five-year period, using the underlying IMF data from LV). These three alternative definitions alleviate concerns that the LV and BVX crisis dates inadvertently contain selection biases or biases in how they time the start of the crisis, though at the expense of potentially over-including events that financial historians may not consider banking crises.

We tend to highlight results using the BVX crisis chronology for two reasons, though we always present analogous results for LV crises and the three quantitative measures. First, BVX crises are a larger sample of events than LV crises (50 BVX crises, compared to 33 LV crises), as LV crises are a more severe subset of BVX crises, being defined as those involving at least three forms of major government interventions.[11] (As an example, the U.S. savings and loan crisis in the 1980s is a BVX crisis but not severe enough to qualify as a LV crisis.) Second, as BVX demarcate banking crises at their panic phase, which tends to be the most extreme phase, often near the end of crises (BVX 2021), they tend to pick up crises later and thus better capture the true acute phase of crises in our view. Indeed, we find that BVX crises give slightly more favorable average long-run returns than LV crises, yet bank stocks after BVX crises still underperform in the long run. Nevertheless, the main results of the paper are generally similar for all five types of banking crises, as we show throughout.

[10] In addition to the >30% decline, we also require, following Frankel and Rose (1996), that the year-over-year change is at least 10 percentage points lower than the previous year's change. This criterion is meant to capture episodes of acute distress rather than incidents of gradual deterioration.

[11] In contrast, bank equity crashes give an even larger set of episodes than BVX crises, at the expense of picking up additional episodes that are likely just stock market crashes and not times of true bank distress.

In Section II, we also briefly analyze other types of crises, such as currency crises, balance-of-payment crises, and recessions (defined, alternately, as the January month after a year in which real GDP growth or when real consumption growth contracts by more than 1%).

Specifically, for currency crises, following Frankel and Rose (1996) and paralleling our definition of a "bank equity crash", we define a "currency crash" as the first month in a 5-year window with a greater than 30% nominal year-over-year decline in the value of a currency relative to the USD. As a second definition of currency crises for robustness analysis, we use Laeven and Valencia's (2020) currency crisis chronology, which is widely used in the literature and incorporates further narrative information from IMF records. We define balance-of-payment crises following the chronology of Kaminsky and Reinhart (1999). We define a "nonfinancial equity crash" analogously to a "bank equity crash" but using the nonfinancial equity index. All crisis dates are listed in Appendix Table C.2. Note that these other crisis definitions are not mutually exclusive: for example, many "banking crises" in our sample are also "real GDP drops" or "currency crashes." Our terms are simply labels for marking crisis episodes based on observative characteristics and do not necessarily imply distinct underlying causes of any type of crisis.

<u>Macroeconomic data</u>. We gather various types of macroeconomic data at a country-level monthly frequency. Data sources for short-term interest rates, inflation rates, USD exchange rates, real GDP, and real consumption (the last two only available at a yearly frequency) are shown in Appendix Table C.1.

II. Returns after banking crises

A. Main results

Using the panel of monthly returns, we first analyze the returns to investing in nonfinancial and bank equity after banking crises. We present the following three results. First, long-run equity returns of both nonfinancial firms and banks are not elevated if one invests in banking crises. Second, there is a high level of risk, as shown by the high variation across outcomes and risk of large subsequent drops, which are often associated with double-dip crises. Third, crises feature mostly "permanent" drops in equity prices leading up to the month of the crisis, with little bounceback afterwards relative to the pre-crisis peak.

To see these results, Figure 1 plots the buy-and-hold abnormal returns (BHARs) for nonfinancial and bank equity around the start of BVX banking panics (in Panel A) and LV banking crises (in Panel B). Figure 2 plots analogous results around the three quantitative crisis measures.

INSERT FIGURES 1 AND 2 HERE

To generate the plots in Figure 1, BHARs are first computed around banking crises in logs using total index returns and relative to each country's unconditional mean; then the mean of these abnormal returns (the solid lines) and the 25th-to-75th percentile range (shaded regions) are calculated across these crises. We compute long-run event studies using BHARs following Barber and Lyon (1997). BHARs are normalized to zero at the end of the starting month of the crisis, which is at t = 0.

In Figure 1, BHARs are calculated for both nonfinancial (orange) and bank (blue) equity total return indexes, using underlying returns that are either in USD (top plots) or LCU terms (bottom plots), and either excess returns (left plots) or real returns (right plots). Figure 1 shows that it does not matter substantially whether LCU or USD returns are used, or real or excess returns, as the plots for each are similar. In all subsequent analysis, we mainly analyze USD excess returns, these being most relevant to an international investor trading across multiple countries.

Several key results emerge from Figure 1. Starting from when returns are normalized to zero at t = 0 (i.e. the end of the crisis month), average crisis returns for both nonfinancial and bank equity do not outperform their unconditional country means for BVX crises and substantially underperform them for LV crises. We will test statistical significance and further discuss these results in the following subsection. Both bank and nonfinancial indexes initially trend downward after month 0, hitting a local trough in month 6, but then do not generally recover by the end of the 60-month horizon. As we will verify with trading strategies, even if investors have particularly good timing to invest right at the trough in month 6, their returns only sometimes outperform the benchmark.

Second, the typical range of crisis returns (the shaded regions, representing the 25th and 75th percentile range) suggests there is substantial risk across crises, as an investor in a single crisis does not know ex-ante which of these returns will be realized. As we will verify later, crises feature substantially higher volatility and negative skewness risk than other times, making trading strategies risky both within and across crises.

Third, the figure shows high and rising prices before the crisis, followed by a large fall just before the start of the crisis in month 0 (as in Baron and Xiong, 2017). There does not appear to be much of a bounceback, at least not in comparison to the initial pre-crisis peak. In this sense, the fall in equity prices appears to be mostly “permanent,” which suggests that prices collapse due to real damage to the economy (and, as we will see, lower future dividends), rather than a temporary decline due to binding leverage constraints or illiquidity.[12]

Figure 2 confirms all these results for the quantitative banking crisis indicators: bank equity crashes (in Panel A), interbank spread spikes (in Panel B), and extensive central bank

[12] Appendix Figure A.2 helps assess the speed of the bounceback relative to the bank equity trough by plotting excess USD returns relative to the local trough of the bank equity returns index (within an 18-month window around BVX crises). By lining up the bank equity trough to $t = 0$, this figure implicitly assumes perfect timing of the troughs and thus obviously does not correspond to a realistic investable strategy. Nevertheless, Figure A.2 does show that the bounceback is relatively quick from the trough, as prices stabilize within 12 months, and that the equity indexes only recover a fraction of the pre-crisis peaks, even under these idealized assumptions. Bank stocks also turn around after the bounceback and substantially drift downward between two and five years after the crisis, suggesting that even with perfect timing of the immediate trough after the crisis, bank equity investors would still not earn positive abnormal returns in the long run.

liquidity support (Panel C). In particular, BHARs for both nonfinancial and bank equity are negative after five years for bank equity crashes and interbank spread spikes, while nonfinancial equity BHARs are just slightly positive (and only after year three) for extensive central bank liquidity support. We will test statistical significance and further discuss these results in the following subsection.

B. Risk and return after banking crises

Table 2 quantifies the risk and return characteristics across crises visualized in Figure 1 and tests differences against the unconditional benchmarks.

INSERT TABLE 2 HERE

Table 2 reports returns for the entire sample in Panel A (which we refer to as the "unconditional benchmark"), for BVX panics in Panel B, for LV banking crises in Panel C, and the three quantitative measures in Panel D. Annualized log excess returns over a 0 to 60 month horizon are first computed for all banking crises of each type in the sample; then, means and standard deviations of these cumulative 60-month returns are computed across crises—along with the percent of the observations with cumulative returns less than -50% and the average return conditional on being less than -50%. Differences in quantities relative to the unconditional benchmark in Panel A are reported (columns 5-7 in panels B-D), along with *t*-statistics. Returns are calculated for both nonfinancial and bank equity total return indexes in both LCU and USD terms; as results are similar, we mainly highlight those in USD terms.

Panel A reports statistics for the unconditional benchmarks (i.e., the 60-month-ahead excess total returns for all country-month observations in the sample). The mean annualized excess returns in USD terms are 5.6% for nonfinancial equity and 4.5% for bank equity. Panel B reports similar quantities conditional on BVX banking crises. The mean annualized excess returns in USD terms are 6.7% for nonfinancial equity and -6.2% for bank equity (column 1).

Comparing to the unconditional benchmark, the mean is 1.1 percentage points higher for nonfinancial equity and -10.1 percentage points lower for bank equity (column 5), with only the latter significantly different from the benchmark. The annualized standard deviations across BVX crises are 26% and 62% (column 2) for nonfinancial and bank equity, respectively, which for banks are 23 percentage points higher than the unconditional volatility from Panel A. As a measure of the skewness of these 60-month returns, we compute the percentage of crises which feature a cumulative return less than -50%, which we find to be 36% for banks (column 3), significantly higher than the benchmark by 21.1 percentage points (column 7). We also compute the average cumulative returns conditional on drops of more than 50% (column 4), which we find to be -109% and -162% (in log returns) for nonfinancials and banks, respectively. These large drops of more than 50% often correspond to double-dip crises: for example, Japan's 1997-98 banking crisis was followed by a second crisis in 2001-03, and the Eurozone's 2007-8 banking crises were followed by the Eurozone crises in 2010-12. All these results are similar when analyzing returns in LCU. In short, BVX crises are followed by lower long-run average returns as well as higher volatility and stronger negative skewness than in normal times.

Panel C shows results conditional on LV banking crises, which show substantially lower returns than for BVX crises. For LV crises, mean excess returns are 2.6% for nonfinancial equity and -12.1% for bank equity (column 1), lower than the benchmark by 3.1 and 16.0 percentage points. Although the standard deviation across LV crises is not higher than in the benchmark for either nonfinancials or banks, there is a greater frequency and magnitude of 50% declines for banks (column 7), compared to the benchmark.

For the quantitative crisis measures in Panel D, nonfinancial equity returns are not significantly greater than the benchmark, and the difference is very close to zero for all three measures (column 5). Bank equity returns are lower by 1.7, 1.9, and 4.4 percentage points after bank equity crashes, interbank spread spikes, and extensive liquidity support, respectively (column 5), though only the last of these is statistically significant. As noted earlier, the BVX and LV definitions might inadvertently contain a hindsight bias, selecting out crises that were (ex-post) severe or long-lasting; the results of Panel D show that the abnormal mean returns, while not as low as in Panels B and C, are never significantly greater from zero and sometimes can be significantly negative.

C. Predictability regressions and short-run downward momentum after crises

The above results can be viewed another way by estimating predictability regressions. We estimate a monthly panel regression with country fixed effects, with the dependent variable being nonfinancial or bank equity log excess returns in USD at H = 1, 3, … 60-month horizons, regressed on an indicator variable that takes the value of 1 if the country-month observation is the start of a BVX banking panic, LV banking crisis, or one of the three quantitative crisis measures. Table 3 reports the results and finds that the coefficients on the LV, BVX, or bank equity crash indicator variables are significantly negative at many horizons—suggesting that crises are not followed by higher excess returns, in line with the results from Table 2. Results in the form of predictability regressions will be useful later when we decompose long-run returns into cash-flow versus discount rate changes.

INSERT TABLE 3 HERE

An important result from Table 3 is that future excess returns are predictably negative in the six months following the acute phase of the crisis (-24% for nonfinancial equity, -47% for bank equity after BVX crises, with similar results after LV crises). Thus, even in the severe phase of a crisis, investors do not fully anticipate that the crisis will tend to considerably worsen.

This predictability or downward momentum is not due to a look-ahead bias in narrative crisis dates, as similar negative returns are often observed after the real-time, quantitative indicators of crises, especially after bank equity crashes. For example, after bank equity crashes, predicted excess returns at H = 6 are -11% for nonfinancial equity (Panel A) and -17% for bank equity (Panel B), both significant at the 10% level. For interbank lending spikes and extensive liquidity support, the coefficients are consistently negative for H ≤ 6 horizons, though more modest in magnitude and only significant in one case.

D. Robustness to subsamples and historical crises

Appendix Figure B.1 and Appendix Table B.2 show that similar results also hold when restricting the analysis to the 1960-2006 sample, demonstrating our main results are not simply driven by the banking crises of 2007-8 or 2011. Similarly, Appendix Figure B.2 and Appendix Tables B.4 and B.5 show similar results when restricting the analysis to either advanced or developing countries.

As a further robustness analysis, we also show that similar predictability results hold on a longer historical sample. Appendix Table B.1, along with Figure 6, which we will further analyze in Section IV, performs analysis on the Jordà-Schularick-Taylor dataset, which covers 17 advanced economies over the period 1870-2016. The advantage of the Jordà-Schularick-Taylor dataset is the longer sample period. The downsides are that it is limited to fewer countries, is annual in frequency, and only contains the broad stock market index returns. Nevertheless, this evidence suggests that similar results hold on this longer historical sample.

E. Comparison with Muir (2017)

While Muir (2017) mainly focuses on elevated *ex-ante* measures of expected returns, he does find, in contrast to us, that equity returns are elevated after crises, by analyzing an annual data set covering 14 advanced economies since 1870. The difference with our results is not due to the sample of countries, advanced versus developing, as the previous section showed that our results hold very similarly for advanced and developing countries separately over the period 1960-2016 (see Appendix Figure B.2 and Appendix Tables B.4 and B.5).

Figure A.3 replicates the upper right subpanel of Figure 2 in Muir (2017). As in Muir (2017), equity total returns are taken from Global Financial Data, and short-term interest rates and Schularick-Taylor financial crises are taken from the JST database (2013 version). All data are annual. We estimate the same specification as in Muir (with country fixed effects and a post-World War II dummy), though for simplicity we only include two types of indicators: for financial crises and "normal recessions." (We omit wars and other events from Muir (2017) due to lack of data, but replication results in Figure A.3 without them are similar to Muir's.).

Panel A of Figure A.3 reproduces Muir's (2017) results over the full sample, 1870-2009.[13] Panel A is similar to the upper right subpanel of Figure 2 in Muir (2017), showing a substantial bounceback in returns from year 1 to 5. However, we then split his sample into the pre-1945 sample (in Panel B) and the post-1945 sample (in Panel C) and find that his results are mainly driven by the pre-1945 sample.[14] On the post-1945 subsample, his results are consistent with ours: an initial bounceback in prices after the crisis, followed by longer-run underperformance between years two and five.

Thus, the bounceback in his results are mainly driven by his inclusion of the 1870-1945 subsample. As mentioned in the introduction, this difference between these subsamples is consistent with a debt overhang explanation, as early financial crises were mainly (though not

[13] Note that Muir's (2017) data set ends in 2009 and thus only includes 1-2 years after the 2007-8 crises in his event study. However, the fact that his data cuts off 1-2 years after the 2007-8 crises is likely not the primary driver of the bounceback he shows on the full sample, as we do not see a bounceback when replicating his results on the postwar 1946-2009 subsample.

[14] The reason that the bounceback in the subsamples (Panels B and C) do not average to the bounceback in the full sample (Panel A) is due to Muir's (2017) specification, which has country fixed effects, a postwar dummy, but not their interaction.

all) temporary liquidity panics, while most post-1945 crises feature credit and real estate booms-gone-bust and large balance sheet losses to the banking and household sectors.

F. Other asset classes

Figure 3 plots cumulative excess USD returns on other asset classes around BVX banking panics, similar to Figure 1 Panel A. In Figure 3, Panel A corresponds to EMBI sovereign bond total returns, Panel B corresponds to currency carry trade returns, and Panel C corresponds to residential real estate price returns. Returns for emerging market sovereign bonds, currency carry trades, and real estate are generally not elevated after banking crises relative to the unconditional benchmark, and in particular, the returns for residential real estate seem to be especially low. Detailed statistics on the risk and return of these other asset classes, analogous to those in Table 2, are presented in Appendix Table A.5.

INSERT FIGURE 3 HERE

G. Other types of crises

Next, we show that we do not find similar results for other types of crises. Those other types of crises are currency crises, balance-of-payment crises, nonfinancial equity crashes, and recessions (defined, alternately, by two indicator variables, *real GDP drops* and *consumption drops*, defined in Section I).

Figure 4 is similar to Figure 1 but for these various other types of crises. Appendix Table A.3 reports mean returns, volatility, and skewness measures, analogously to Table 2, across these other types of crises; Table A.4 reports results from predictability regressions; and Table A.6 reports trading strategies (discussed in Section III) around these other types of crises. These results show that for currency crashes especially, excess returns are high, on average 6.6

percentage points higher per year for nonfinancials than the unconditional mean.[15,16] Nonfinancial equity crashes and consumption drops are also followed by significantly higher returns for nonfinancial equity.

INSERT FIGURE 4 HERE

Why do other types of crises, such as currency crises, nonfinancial equity crashes, and consumption drops, see high returns? Research has shown that banking crisis recessions tend to be unusually deep and persistent compared to noncrisis recessions and other types of crises, in large part due to balance sheet problems in the household and banking sectors, which can take many years to resolve. In Section V, we argue that the long-run underperformance of bank returns, in particular, may be due to investors not fully anticipating the long-lasting macroeconomic consequences of debt overhang, which depresses long-run dividends. For these other types of crises featuring much less severe and less persistent balance sheet concerns, investors may better price in the losses at the moment of the crisis, resulting in larger immediate fall in prices and higher subsequent returns in the long run. This interpretation also helps explain why equity prices bounced back rapidly after the COVID-related financial distress in spring 2020, as the onset of COVID led to temporary liquidity and funding problems for market participants but did not lead to deep and persistent balance sheet problems in the household and banking sectors.

[15] These high returns for other crises are unlikely to be explained by outlier observations, as returns are very high even after excluding observations with nominal 0-60-horizon returns greater than 400% (which, in practice, excludes two positive outliers, Russia in 1998 and Venezuela in 2009). In addition, Figure 4 plots returns of the 25th to 75th percentile range, which is robust to outliers.

[16] A potential concern is that illiquidity during currency crises and similar types of emerging market crises might make it difficult to achieve such high returns in practice (echoing the concerns of Burnside, Eichenbaum and Rebelo 2007, who show that bid-ask spreads are high in emerging market currencies). However, we show that elevated returns are also present when restricting the sample to advanced economy crises, where foreign exchange markets are more liquid. Furthermore, we study five-year strategies, so liquidity is less of a concern over this longer horizon, as investors can be patient over a period of months in building or selling off their positions. Finally, these strategies involve investing into crisis countries during times of capital outflows (thus, one is providing liquidity to the market, as other traders are exiting), making it likely that the liquidity provision may be one of the factors helping to explain the high returns.

III. Trading strategies

The returns presented in the previous section do not necessarily reflect investor returns based on crisis trading strategies. For example, the risk measures in Table 2 do not account for the fact that investors may diversify across multiple crises in ways that may reduce the total risk of a crisis-investing strategy. We thus evaluate trading strategies based around investing in crises and find that they do not often beat an international passive strategy in absolute performance or on a risk-adjusted basis—and for bank stocks, they consistently produce negative alpha.

Results from trading strategies are reported in Table 4. The benchmark, reported in the first two rows in each of the panels of Table 4, is the baseline passive strategy in which an investor buys an equal-weighted portfolio of either nonfinancial or bank equity indexes across all countries and for the entire sample, irrespective of crises. This passive benchmark, like all the following trading strategies, is reported in excess USD returns (using the USD exchange rate and the U.S. short-term interest rate). Subsequent rows in Table 4 report trading strategies that invest conditionally on BVX panics (rows 2-5), LV crises (rows 6-9), or the three quantitative banking crisis measures (rows 10-21). For each banking crisis type, we compare the "0-60 month" strategy (i.e., buying at the end of month 0 and selling at the end of month 60) to the passive benchmark. The strategies are constructed from the point of view of a USD-based investor who invests 100% of his or her wealth over the specified horizon in countries with a crisis (dividing the wealth equally, if more than one country is in crisis at a given time) and in U.S. T-bills otherwise.

Table 4 reports statistics on the excess USD returns earned from various trading strategies, specifically the annualized mean, volatility, Sharpe ratio, and factor alphas based on the monthly time series of each strategy's performance. The "international three-factor" alpha refers to the alpha after controlling for the global equity market, size, and value factors from

Karolyi and Wu (2021), and the "international three-factor + LRV" alpha additionally controls for three currency risk factors: the carry trade, dollar, and dollar-carry-trade factors of Lustig, Roussanov, and Verdelhan (2011, 2014). The latter is our preferred measure of alpha, as it controls for broad movements in international equity factors and currency risk factors. Below each of the statistics, we test the difference relative to the passive benchmark.

INSERT TABLE 4 HERE

The 0-60-month strategies based on BVX crises generate mean excess returns relative to the passive benchmark (row 3) of 0.4% and -7.5% for the nonfinancial and bank equity index, respectively (both not significant); Sharpe ratios relative to the benchmark by -0.099 and -0.462 (the latter statistically significant at the 10% level); "international three-factor" alphas relative to the benchmark by 0% and -11.0% (the latter statistically significant at the 5% level); and "international three-factor + LRV" alphas relative to the benchmark by -0.7% and -11.8% (the latter statistically significant at the 5% level). Thus, for BVX crises, neither nonfinancial nor bank equity outperforms the passive benchmark, and bank equity substantially underperforms it.

For LV crises (rows 6-9) and bank equity crashes (rows 10-13), returns are considerably worse both for bank and nonfinancial equity strategies. The 0-60-month strategies generate mean excess returns, Sharpe ratios, "international three-factor" alphas, and "international three-factor + LRV" alphas all several percentage points below the passive benchmark, with differences being significantly negative and large in many, but not all, cases.

We also analyze a "6-60 month" strategy (i.e., buying at the end of month 6 after the crisis and selling at the end of month 60). We show that even if investors have particularly good timing to buy at the six-month point after the crisis where prices on average reach a trough (as shown in Figure 1), returns of such strategies are elevated at most a few percentage points for nonfinancial equity and still underperform for bank equity. We thus consider the results from the 6-60-month strategy to be an "upper bound" on realistic investor performance, given the difficulty of consistently timing the trough in practice. However, even these 6-60 "upper bound" strategies do not often beat the benchmarks, both in terms of absolute and risk-adjusted returns.

Table 4 shows that, for the 6-60-month strategies and BVX crises (rows 4-5), results are similar to the 0-60 horizon though slightly higher: mean returns are higher than the passive benchmark by 2.8% (not significant) for nonfinancial equity and lower by 4.4% (compared to 7.5% for the 0-60 horizon) for banks. Thus, while nonfinancials may outperform the passive benchmark at this "upper bound" 6-60 horizon, bank stocks still do not. Furthermore, for the LV crises, even the 6-60-month strategies (rows 8-9) underperform the benchmark consistently for both nonfinancials and banks, yielding lower mean returns relative to the passive benchmark by 2.8% and 2.3%, lower Sharpe ratios by 0.218 and 0.267, lower "international three-factor" alphas by 1.5% and 3.6%, and lower "international three-factor + LRV" alphas by 2.0% and 4.8% for the nonfinancial and bank equity indexes, respectively. Thus, we conclude that even these "upper bound" strategies do not often beat the benchmarks, either in absolute or risk-adjusted terms.[17]

Similar results hold for the three quantitative measures of crises. For both nonfinancial and bank equity, returns are generally slightly negative relative to the passive benchmarks for the strategies after bank equity crashes and extensive liquidity support, in terms of mean returns, Sharpe ratios, and factor alphas; and negative after interbank spread spikes, though in no cases are they significantly different from zero. In addition, the results of these three measures at the 6-60 horizon are not generally different from those at the 0-60 horizon.

[17] Note that we do not account for transaction costs in our analysis but doing so would likely make the returns of crisis strategies slightly worse, strengthening our conclusions. In any case, transaction costs would likely be small, given that these crisis trading strategies involve holding periods of five years with no rebalancing or dynamic trading.

Appendix Table B.3 shows that similar results to those above hold even when restricting the sample to 1960-2006, demonstrating the results are not simply driven by the banking crises of 2007-8. Similarly, Appendix Tables B.6 and B.7 shows similar results when restricting the analysis to either advanced or developing economies.

Appendix Table A.7 shows trading strategy results for the other asset classes (EMBI sovereign debt, currency carry trades, and residential real estate). Returns for EMBI sovereign debt and currency carry trades are generally not significantly elevated at any horizon compared to the passive benchmark. Real estate price returns relative to the passive benchmark are consistently negative by around three to six percentage points (annualized), depending on the return measure used.

IV. Decomposing returns into cash flow versus discount rate changes

We next decompose returns after crises into cash flow versus discount rate changes following Campbell and Shiller (1988a, 1988b). As we have shown in Section II, while there is a brief period after banking crises when equity returns are temporarily depressed and partially bounce back, our analysis that follows suggests that banking crises are best viewed at longer horizons as essentially equity cash flow shocks, given that crises are followed by lower long-run future dividends rather than higher long-run expected returns.

We start by reconciling our results with those of Muir (2017), who shows that dividend-price ratios are elevated in the aftermath of banking crises. Muir (2017) follows the usual assumption in asset pricing that dividend-price ratios are good proxies for risk premia and concludes that equity risk premia increase during banking crises. While we confirm that dividend-price ratios are elevated during banking crises because stock prices fall substantially at the start of crises, we do not find that total returns are higher after. Dividend-price ratios are temporarily high during banking crises, as prices suddenly fall at the onset of the crisis, while dividends are sticky in the short-run. However, the dividend-price ratio then adjusts not because prices rebound (a discount rate effect, as conjectured by Muir 2017), but because banking crises systematically feature a fall in future dividends.

In Figure 5, we analyze this issue by plotting the coefficients in the following regression:

$$x_{i,t} = \mu_i + \sum_{j \in -60:12:60} \beta_{-j} BVXpanic + u_{i,t} \quad (1)$$

where $x_{i,t}$ stands for the cumulative log excess return (top plots), the log price-dividend ratio (middle plots), or log dividends (bottom plots). Log excess returns are the cumulated values relative to t = -60, and the log price-dividend ratio and log dividends are the levels relative to t = -60. Panels A and B report results for nonfinancial equity and bank equity, respectively. The regression also contains country fixed effects (μ_i), so that estimates plotted in Figure 4 are relative to each country's long-run average.

INSERT FIGURE 5 HERE

The top plots for cumulative log excess returns show that returns fall sharply before month t = 0 for both nonfinancial and bank stocks. After t = 0, consistent with the results from Section II, we do not observe higher-than-average returns after banking crises, and for bank stocks they are considerably lower.

The middle plots show that the log price-dividend ratio falls around month 0 but then rises again (as dividends continue to fall and as prices partially rebound by t = 12), converging to baseline levels in the long-run. The bottom plots show this pattern for the price-dividend ratio is driven in large part by falling dividends, as the dividend level is strongly negative for bank stocks relative to both t = -60 and t = 0, and even for nonfinancial stocks it is considerably lower than its pre-crisis peak at t = 0.[18]

Figure 6 performs this same analysis on the Jordà-Schularick-Taylor dataset, which covers 17 advanced economies over the period 1870-2016. As mentioned before, this dataset is limited to fewer countries, is annual in frequency, and only contains the broad stock market index returns, but this evidence nevertheless suggests that similar results hold on this longer historical sample. In particular, long-run dividends after crises are lower for the broad market index also over advanced economies since 1870.

INSERT FIGURE 6 HERE

Thus, we conclude that stock prices fall substantially at the occurrence of banking crises, but long-run total returns are not elevated relative to the country unconditional average. Instead, dividends deteriorate until the dividend-price ratio returns to baseline levels, suggesting that, from a long-run perspective, crises are best viewed as mainly cash flow shocks. Overall, this result adds to the evidence that equity prices collapses during banking crises are mainly due to real damage to the economy, which leads to lower long-run dividends.

V. Potential explanations

Why do the long-run returns to investing in crises tend not to be elevated? One possibility is that long-term risk premia do not increase during financial crises. In this section, we entertain the other possibility that risk premia initially increase, but that investors do not fully anticipate the subsequent long-run decline in dividends. Consistent with this hypothesis,

[18] Bank dividends may be restricted by governments in the aftermath of crises. However, the fact that dividends are substantially lower even five years later, in addition to the fact that dividend levels are lower for nonfinancial equity (in the main sample) and the broad market index (in the JST sample over the period 1870-2016), suggest that regulatory restrictions are not the main force driving long-run lower returns.

we find that both long-run returns and dividends after banking crises can be predicted with measures of the extent of debt defaults and debt overhang at the time of the crisis. In contrast, fiscal policy and macroeconomic indicators at the time of the crisis have little predictive power of return outcomes across crises, suggesting that investors correctly price in this type of information at the time of the crisis.

Specifically, we regress future returns conditional on BVX banking crises on various explanatory variables, which allows us to gauge which variables help explain the variation in investment outcomes across crises. The explanatory variables fall into three broad categories:

1. Debt overhang variables: lagged past three-year change in household debt-to-GDP (as a measure of the pre-crisis credit boom), lagged bank capitalization, and the change in nonperforming loans (NPLs) from the one year before the crisis to the one year after.
2. Policy variables: measures of changes in monetary and fiscal policy, specifically the change in policy interest rates from the average two years before to the average one year after the crisis, and the same for the change in the primary fiscal balance to GDP.
3. Macroeconomic variables: lagged past three-year average of GDP growth (as a measure of pre-crisis economic growth) and lagged past three-year change in the current account surplus or deficit to GDP.

Figure 7 reports β estimates at various horizons h from the regression:

$$\log Total\ Returns_{i,t+h} = \alpha_{i,t} + \beta X_{i,t} + \gamma Z_{i,t} + \varepsilon_{i,t+h} \qquad (2)$$

where i and t denote countries and time, $X_{i,t}$ is the variable of interest, and $Z_{i,t}$ denotes the control variables (past three-year real GDP growth and an indicator for 2007-08 crises). The variables of interest in Panel A are the debt overhang variables listed above, while the variables of interest in Panels B and C are the policy and macroeconomic variables. Table 5 reports the same results at various future horizons (h = 12, 36, 60) in tabular form. All the variables of interest are standardized; thus, estimates correspond to the average change in subsequent returns associated with a one-standard-deviation increase in one of the regressors.

INSERT FIGURE 7 AND TABLE 5 HERE

Figure 7 shows that a one-standard-deviation increase in all the debt overhang-related variables in Panel A is associated with lower returns over the subsequent 60 months. The results are strongest and more often statistically significant for bank equity. Except for NPLs, the debt overhang variables are known at the time of the crisis (t = 0), so investors have access to this information when forming expectations of future returns. The reason why NPLs include one year of future information is that NPLs at t = 0 or before are not informative, often still near pre-crisis levels. NPLs generally take at least a year after the crisis to increase, likely due to slow recognition of problem loans. Given that the NPLs measure uses information up to time t+1, one should focus on the predictability at longer horizons for this variable.

We repeat this analysis replacing the dependent variable in Equation (2) with dividends. The results of this exercise are displayed in Figure 8 and Table 6, which show that increase in all the debt overhang-related variables are associated with lower future dividends. Thus, according to our interpretation, investors may not fully anticipate that the long-lasting consequences of debt overhang may lower future dividends.

INSERT FIGURE 8 AND TABLE 6 HERE

In contrast, many of the policy and macroeconomic variables in Panels B and C are not associated with differential outcomes in terms of future returns, either because policy may be endogenous to the severity of the crisis or because investors correctly anticipate the consequences of these policies. The exception is monetary policy, which predicts long-run outcomes for bank equity returns, perhaps because monetary policy can help reinflate bank and household balance sheets, lessening the long persistence of the bad-loan problem and debt overhang in the banking and household sectors, which we argue investors do not fully price in at the time of the crisis. The null results in Panel B are robust to a variety of other ways to measure changes in fiscal policy or pre-crisis macroeconomic growth (not reported). Similar results also hold for predicting dividends. These results suggest that investors correctly price in this type of information at the time of the crisis.

The explanatory power of debt overhang-related variables in Panel A suggests that the long-run underperformance, especially of bank stocks, may be due to investors not fully anticipating the long-lasting macroeconomic consequences of debt overhang, which depresses long-run dividends. Thus, one interpretation of our results is that investors at the time of crises may underappreciate the persistence of debt problems and the long shadow of its impact on corporate and bank earnings, or they may overestimate the speed of recovery. Consistent with this interpretation, we show in Appendix Table A.9 that IMF macroeconomic forecasts are overoptimistic in forecasting the speed of recovery after banking crises but not after other types of crises.

VI. Conclusions

In contrast to the widely held view that investors can buy assets at deep discounts during banking crises, we find that buy-and-hold returns tend not to be elevated in the aftermath of banking crises. Equity prices fall and partially bounce back during the most acute phase of a crisis, but price-dividend ratios mostly return to normal when dividends ultimately fall. We offer two candidate explanations for these findings. A textbook interpretation is simply that risk premia do not increase during banking crises–that at least some investors are unconstrained and that these investors correctly anticipate that dividends will eventually fall. However, this interpretation seems at odds with the evidence that distorted beliefs play a crucial role in the origins of banking crises, tending to fuel credit booms and asset price booms, which in turn tend to go bust and cause banking crises (Kindleberger 1978, Schularick and Taylor 2012, Baron and Xiong 2017).

We thus entertain another interpretation that investors do not fully anticipate the consequences of banking crises. Consistent with this interpretation, we first find that asset returns exhibit short-run downward momentum at the onset of banking crises; thus, even though prices fall substantially leading up to the acute phase of the crisis, this fall is not enough to make long-run future returns elevated. Second, we find that variables related to debt overhang have predictive power for the variation in investment outcome. This result suggests that investors do not fully understand the effect of debt overhang, which depresses long-term dividends. Among the menu of assets we consider, bank equities exhibit the worst performance. This finding can explain why sophisticated investors are reluctant to buy risky assets during banking crises, particularly bank stocks. Overall, our results suggest that the outperformance of risky assets in the U.S. following the 2007-8 financial crisis is the exception rather than the rule, which stresses the importance of using historical data when studying rare events.

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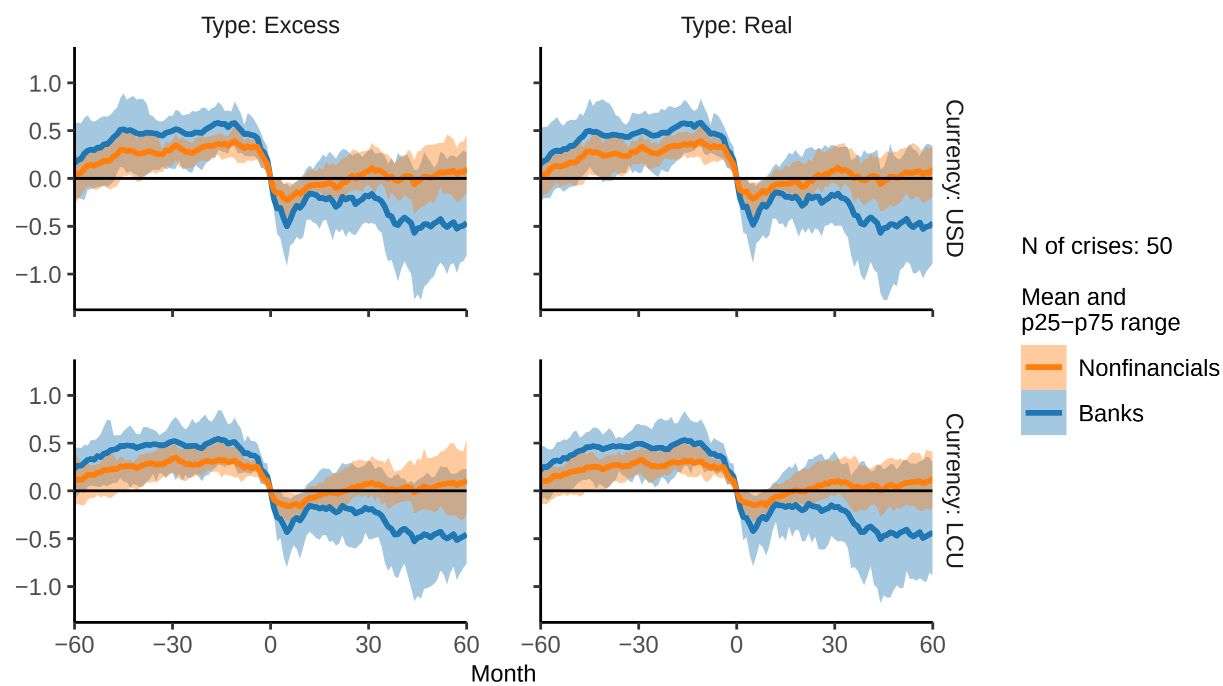
Figure 1: Equity returns around banking crises

Panel A plots buy-and-hold abnormal returns (BHARs) around Baron, Verner, and Xiong (2021, hereafter "BVX") banking crises. Panel B plots the same but for Laeven and Valencia (2020, hereafter "LV") banking crises. BHARs are computed in logs for all banking crises of each type in the sample, after subtracting out each country's unconditional average returns; then, the mean (solid lines) and the 25th-to-75th percentile range (shaded regions) are calculated across banking crises. All BHARs are total returns relative to the end of month 0, the month of the crisis. Returns are calculated for both bank (blue) and nonfinancial (orange) equity total return indexes, both in US dollars (top plots) and in local currency units (bottom plots), and for both excess returns (left plots) and real returns (right plots). Since BHARs have been calculated by first subtracting out each country's unconditional average returns, the x-axis represents the unconditional average. Excess and real returns are calculated relative to the country-specific short-term interest rate and inflation rate for LCU returns, and relative to the U.S. T-bill rate and U.S. inflation rate for USD returns.

(A) BVX banking panics



(B) LV banking crises

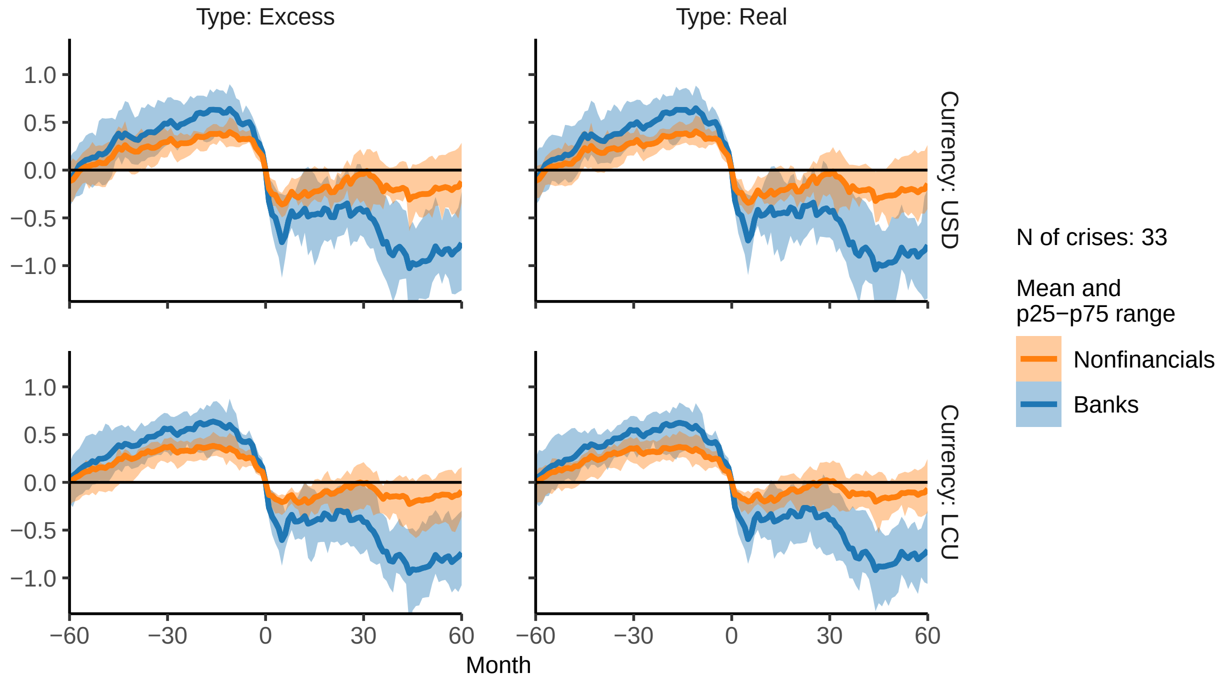
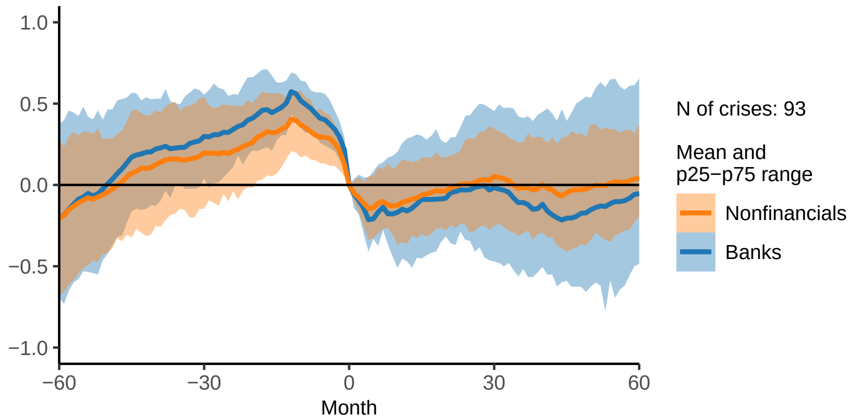


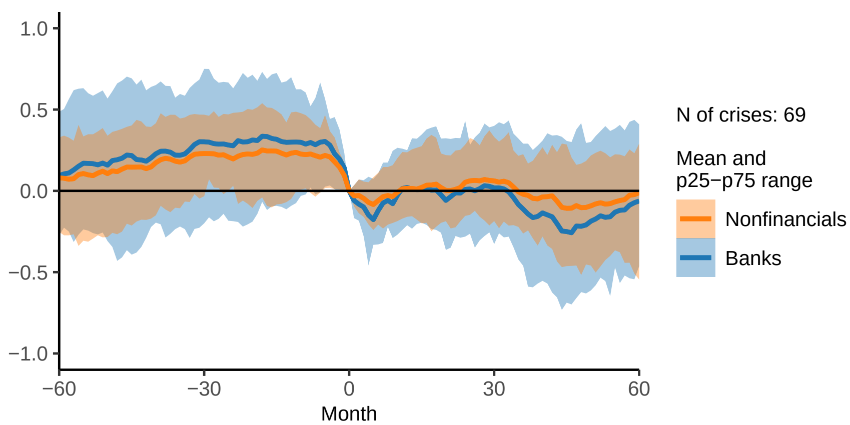
Figure 2: Equity returns around banking crises defined by real-time measures

This figure is similar to Figure 1, plotting USD excess returns around alternative banking crisis indicators. Panel A plots BHARs around 30% bank equity crash months. Panel B plots the same for months of interbank spread spikes of 2% or more, and Panel C for months in which the central bank's liquidity support first crosses 5% of total banking sector deposits. See text for further details on how these three types of events are defined.

(A) Bank equity crashes



(B) Interbank spread spikes



(C) Introduction of extensive liquidity support

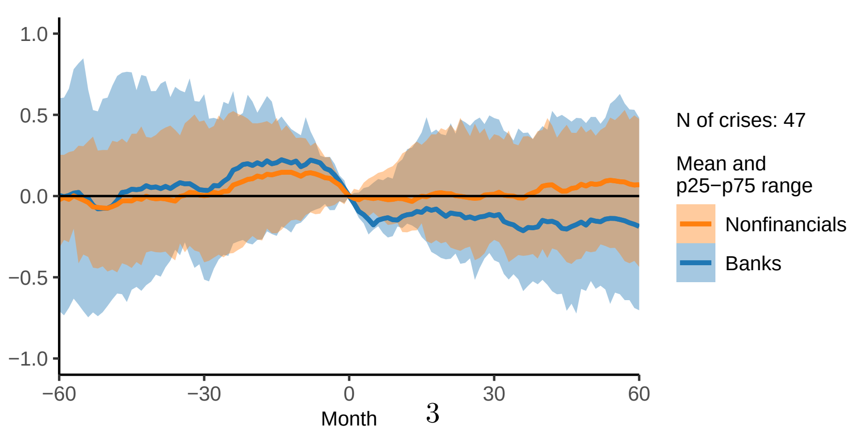
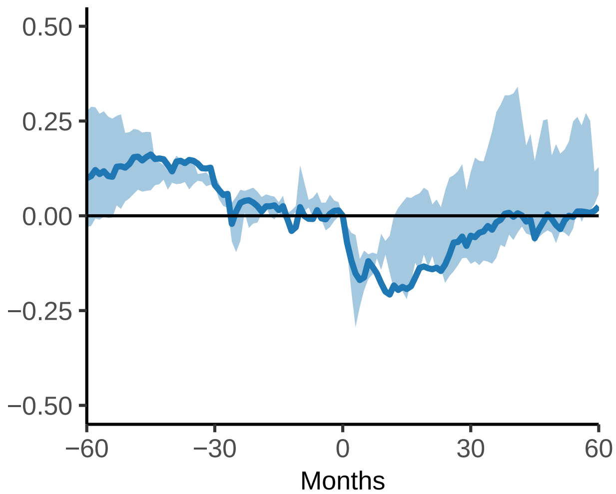


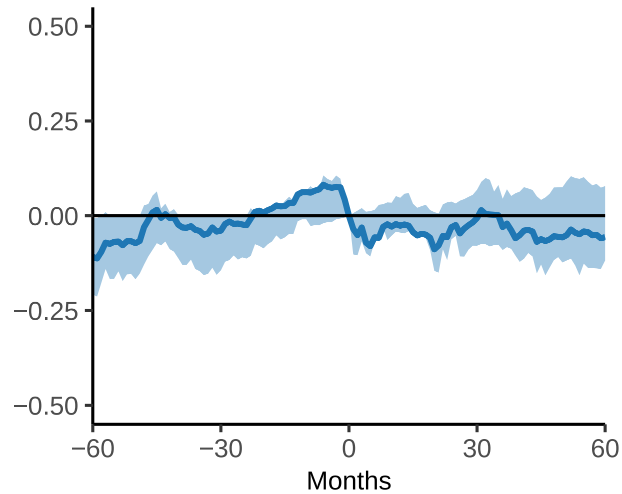
Figure 3: Cumulative returns on other asset classes

This figure is the same as Figure 1 Panel A but for three other asset classes. Excess USD BHARs are plotted around BVX banking crises. Panel A shows EMBI sovereign bond total returns, Panel B shows currency carry trade returns, and Panel C shows residential real estate price returns.

(A) EMBI sovereign bonds



(B) Currency carry-trades



(C) Residential real estate

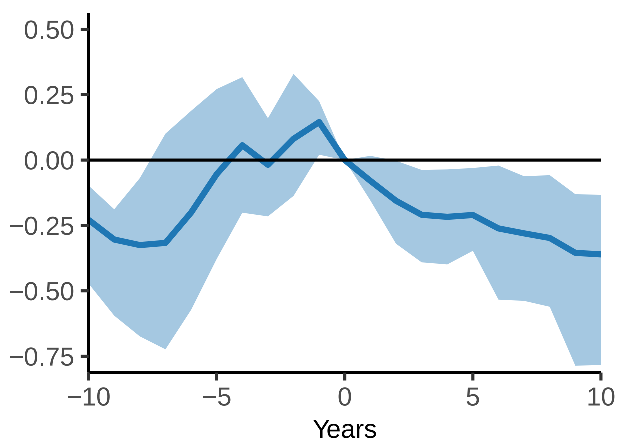


Figure 4: Equity returns around other types of crises

This figure is the same as Figure 1 using excess USD BHARs but for the various other types of crises defined in Section I.

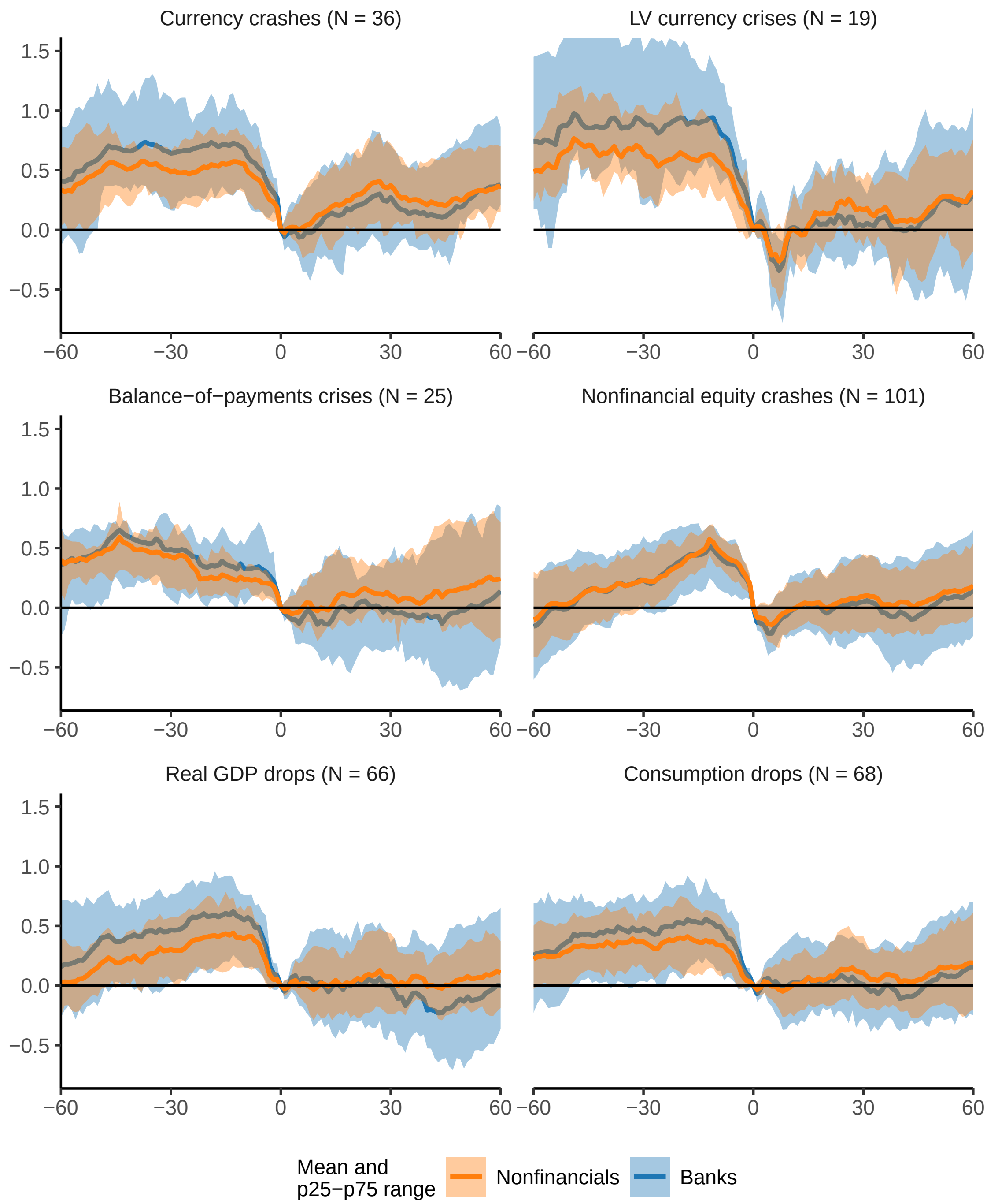


Figure 5: Excess returns, prices, and dividends around banking crises

This figure plots the coefficients from the following regression:

$$x_{i,t} = \mu_i + \sum_{j \in -60:12:60} \beta_{-j} BVXpanic + u_t,$$

where $x_{i,t}$ stands for the cumulative log excess return (top plots), the log price-dividend ratio (middle plots), or log dividends (bottom plots). Log excess returns are cumulated values relative to $t = -60$, and the log price-dividend ratio and log dividends are the levels relative to $t = -60$. Panel A presents results for nonfinancial equity, and Panel B shows results for bank equity.

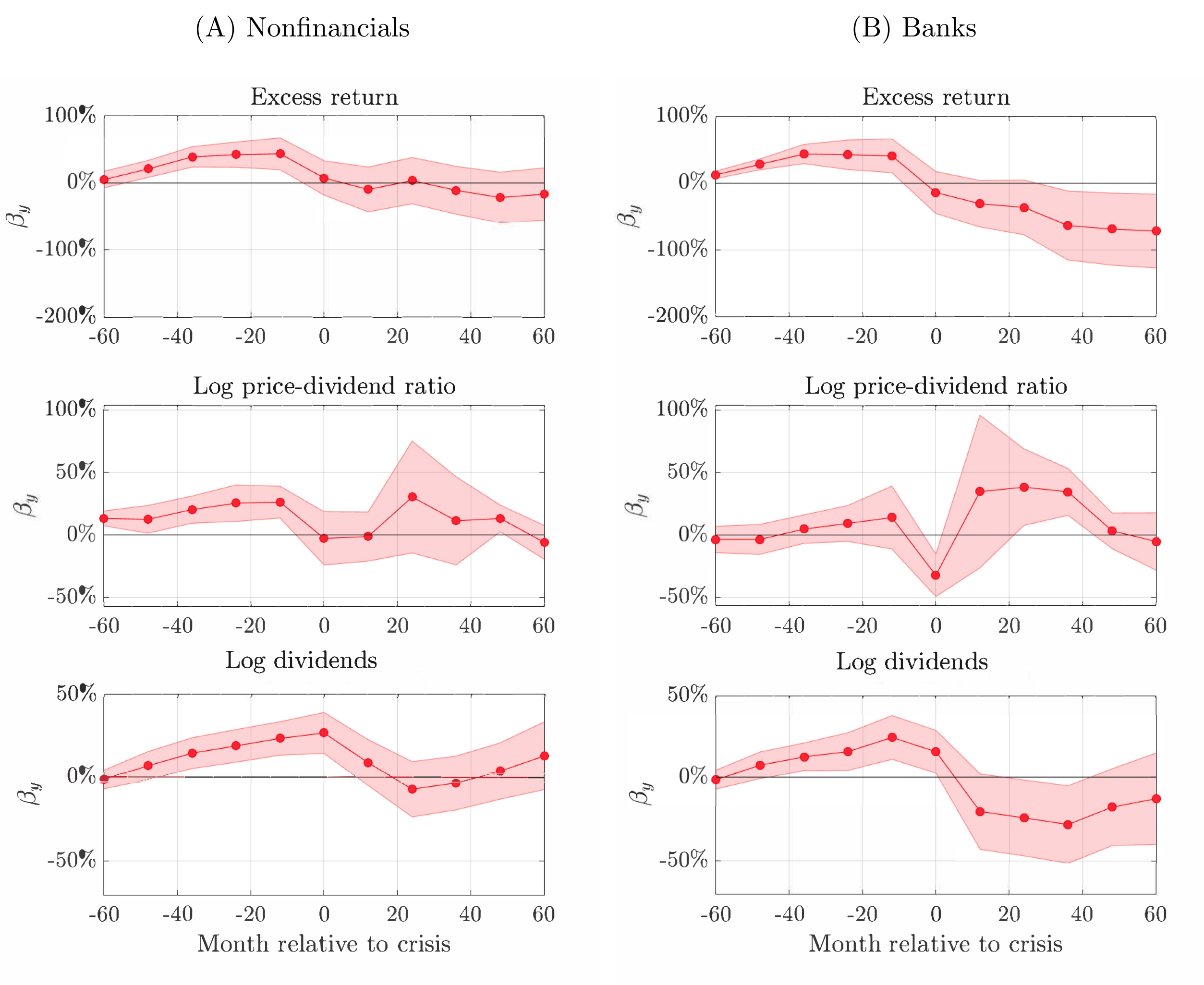


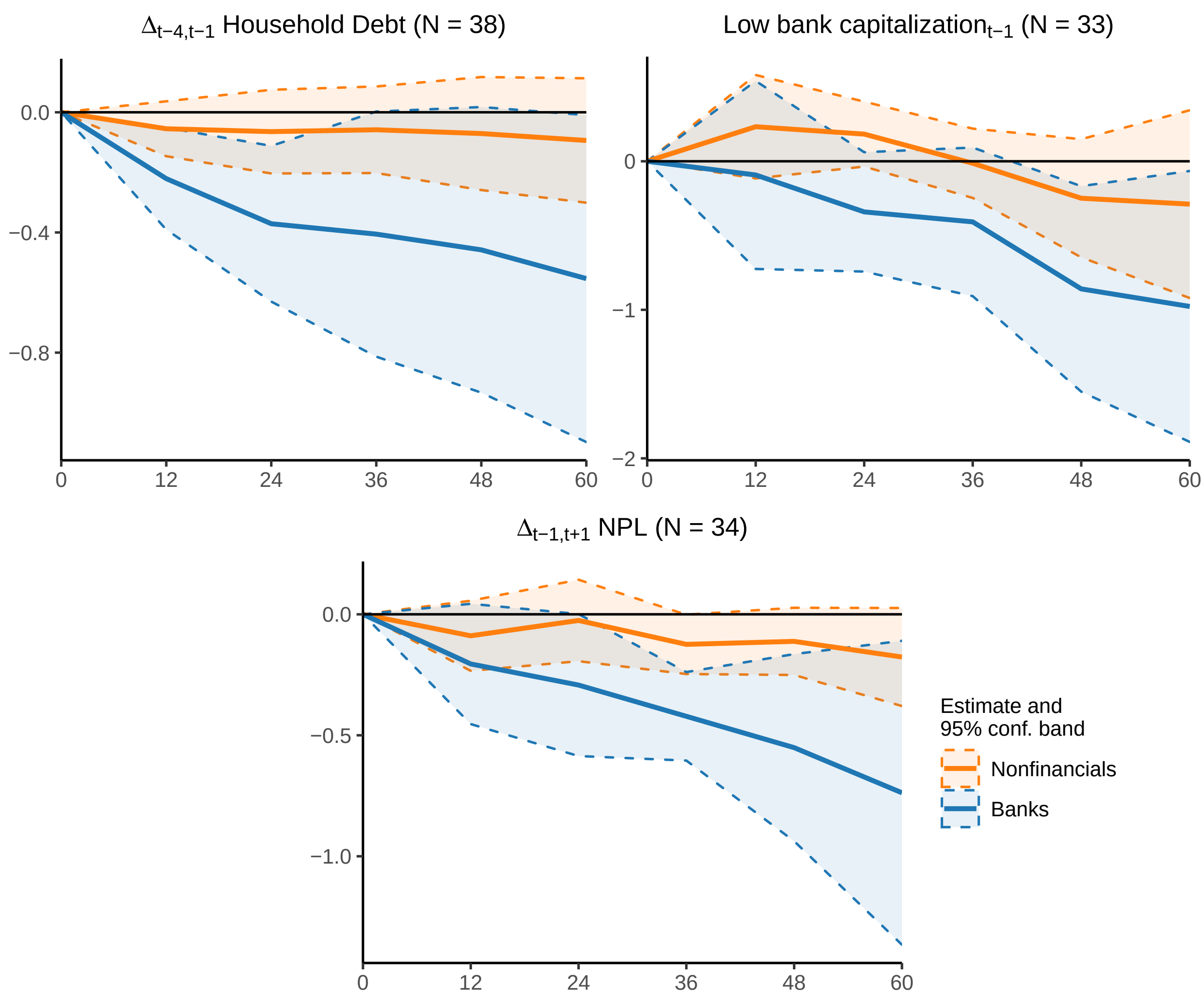
Figure 6: Excess returns, prices, and dividends using the Jordà-Schularick-Taylor data set

This figure is similar to Figure 5 but estimated on the Jordà-Schularick-Taylor data set, which covers 17 advanced economies over the period 1870-2016. Excess total returns and dividends are given in LCU in this data set and correspond to the broad market equity index for each country. The data is annual, and banking crisis years given by this data set are from Schularick and Taylor (2012).

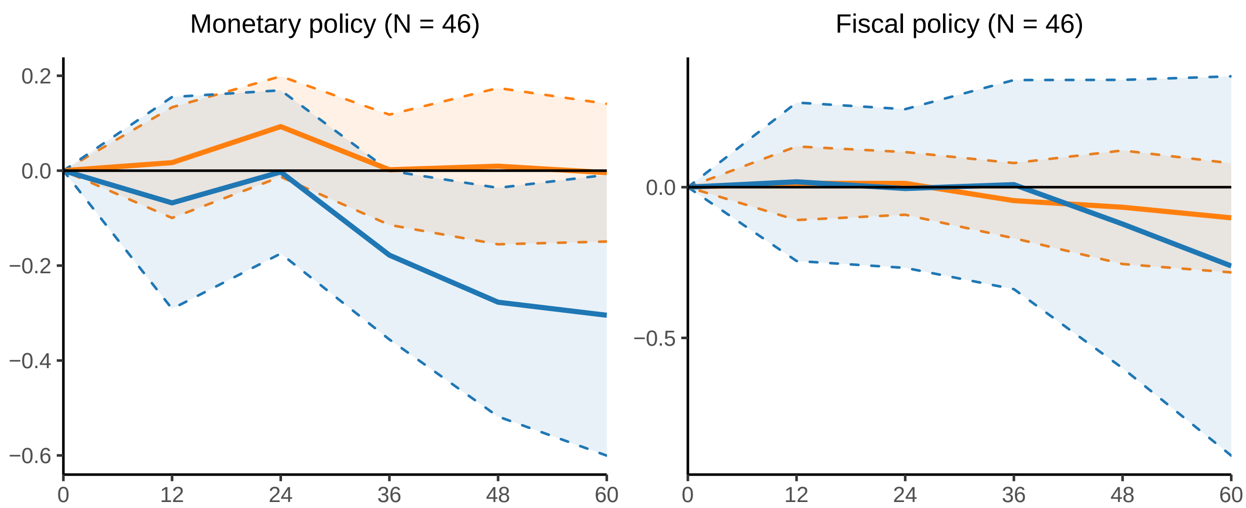
Figure 7: What explains the low returns after banking crises?

This figure reports estimated parameters β at various horizons h from the equation $\Delta_{t,t+h} \log \text{Total Returns}_{it} = \alpha_i + \beta X_{it} + \gamma Z_{it} + \varepsilon_{it}$ where X_{it} is one of the variables of interest and Z_{it} denotes the controls. The regression is estimated across BVX banking crises. This figure corresponds to Table 5. All variables of interest are standardized; thus, the estimates in the figure show the average change in subsequent returns associated with a one-standard-deviation increase in one of the regressors. The 95% confidence bands (dashed lines) are computed using heteroskedasticity-robust standard errors.

(A) Debt overhang variables



(B) Policy variables



(C) Macro variables

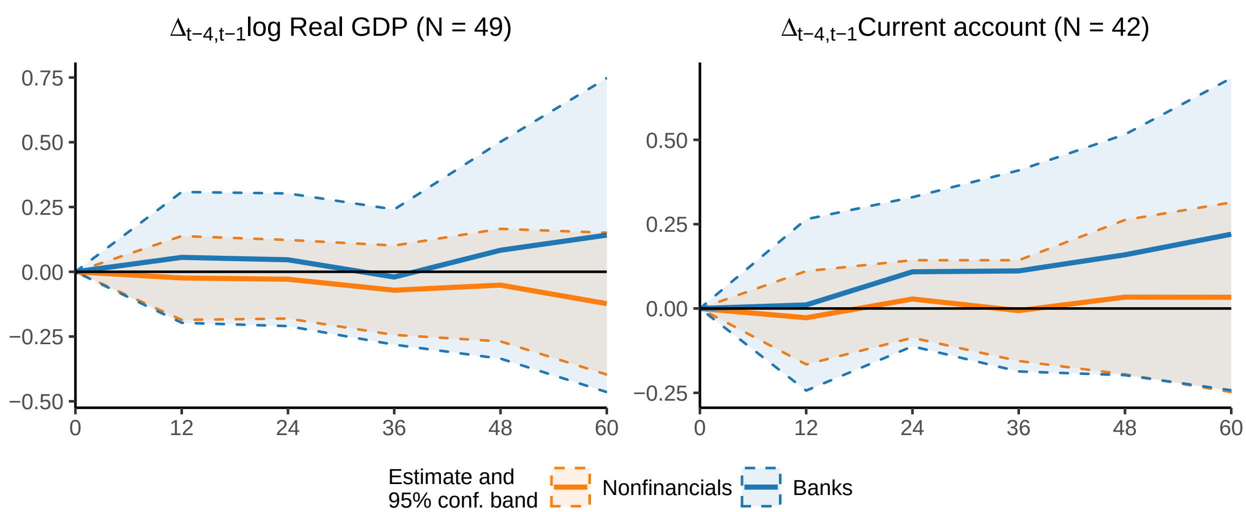
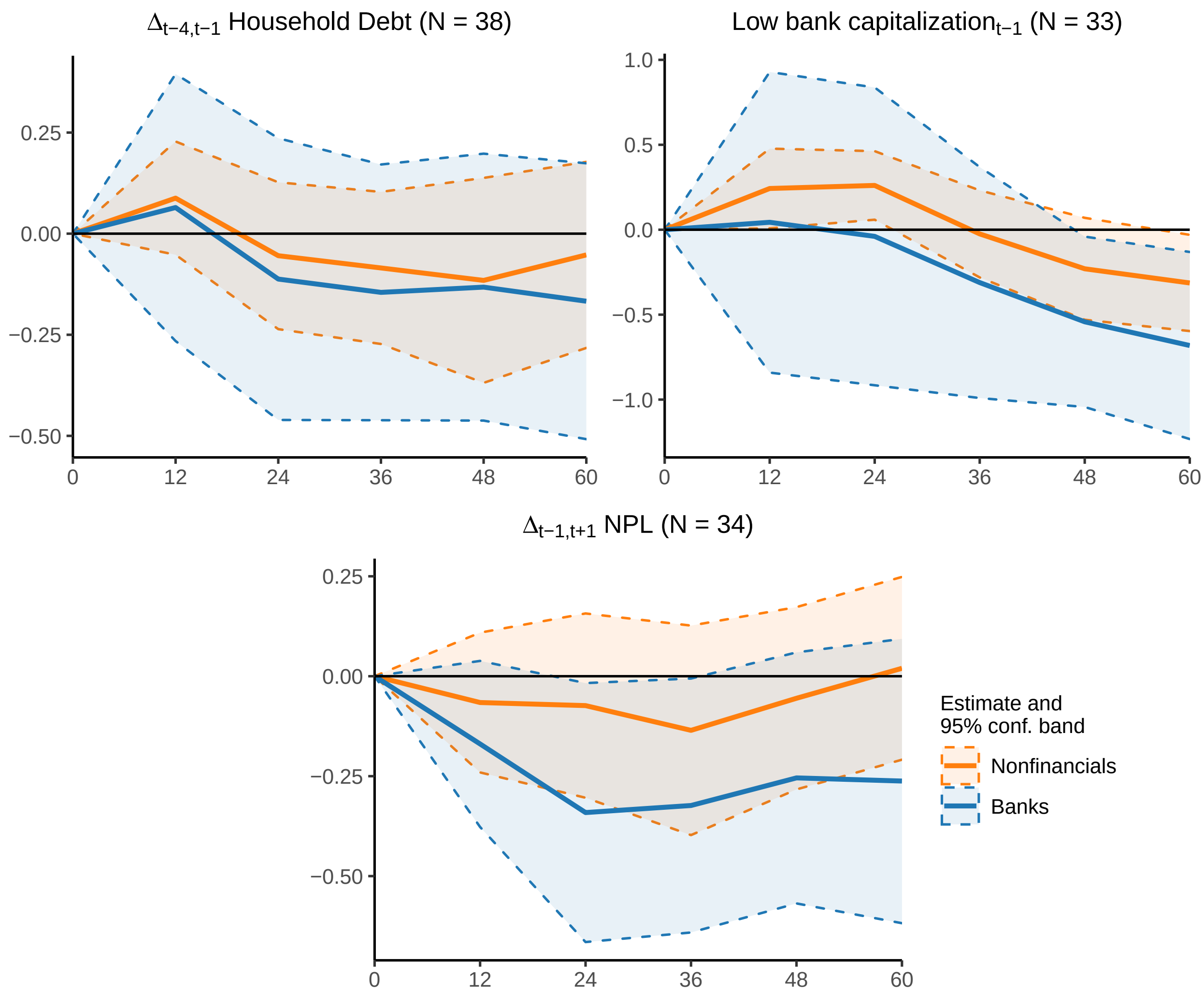


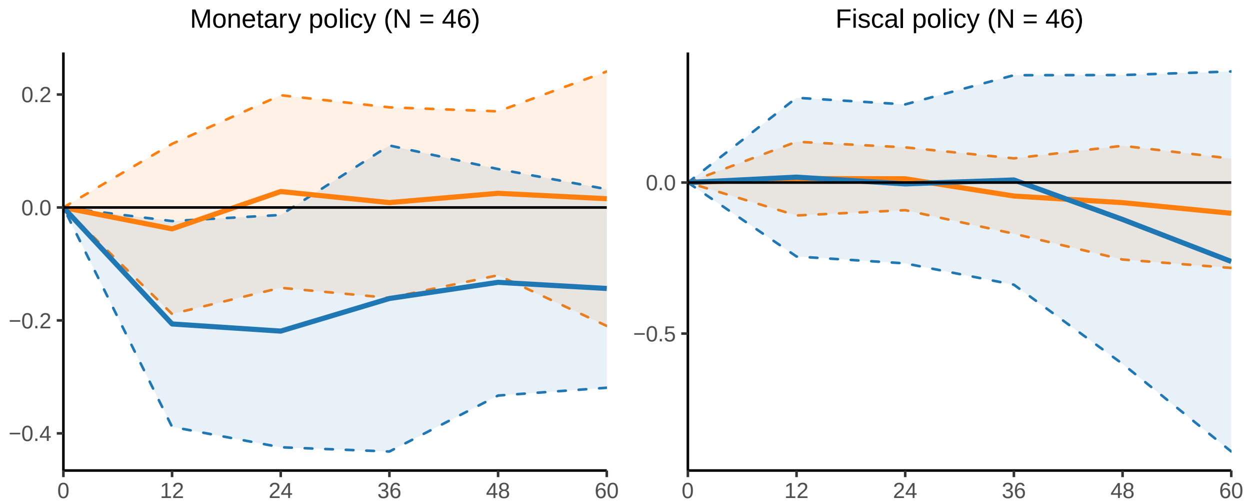
Figure 8: Dividend growth after banking crises

This figure is the same as Figure 7 but with $\Delta_{t,t+h} \log \text{Dividends}_{it}$ as the dependent variable. These estimates are also reported in Table 6.

(A) Debt overhang variables



(B) Policy variables



(C) Macro variables

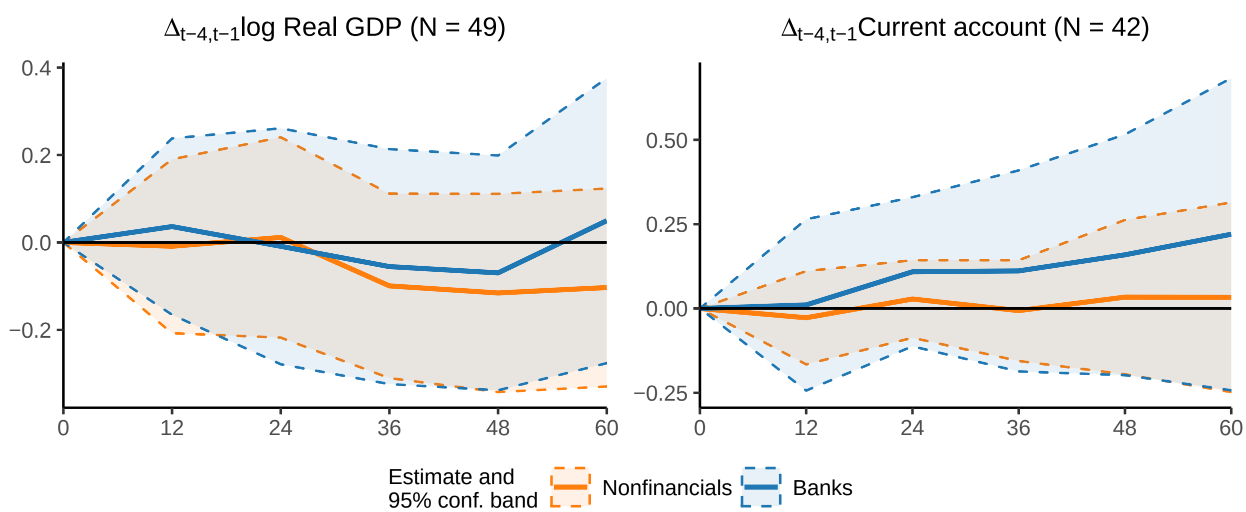


Table 1: Summary statistics

Summary statistics are reported for the returns of five asset classes: bank and nonfinancial equity total returns, EMBI sovereign bond total returns, currency carry trade returns (from a USD-based investor's perspective), and residential real estate price returns. Returns are reported both in USD terms and in local currency units (LCU) when appropriate. The mean, standard deviation, and percentiles are calculated using monthly arithmetic returns (quantities are not annualized in the table), except for residential real estate price returns, which are annual.

Asset	Currency	Mean	Std. dev.	p5	p25	p50	p75	p95	N	Frequency
Nonfin. stocks	USD	0.008	0.078	-0.114	-0.034	0.008	0.049	0.125	17425	Monthly
	LCU	0.007	0.069	-0.100	-0.028	0.008	0.043	0.112	17425	Monthly
Bank stocks	USD	0.009	0.099	-0.139	-0.040	0.007	0.054	0.157	17425	Monthly
	LCU	0.008	0.090	-0.124	-0.035	0.006	0.048	0.139	17425	Monthly
EMBI bonds	USD	0.006	0.042	-0.054	-0.009	0.007	0.023	0.065	3541	Monthly
Carry-trades	USD	0.002	0.034	-0.047	-0.012	0.002	0.016	0.051	16861	Monthly
Residential real estate	USD	0.028	0.147	-0.180	-0.066	0.012	0.118	0.277	1142	Annual
	LCU	0.022	0.078	-0.095	-0.021	0.020	0.060	0.147	1142	Annual

Table 2: Equity returns after banking crises

This table reports buy-and-hold excess returns over 0 to 60-month horizons for the entire sample (Panel A), for Baron, Verner, and Xiong (2021, hereafter "BVX") banking crises (Panel B), for Laeven and Valencia (2020, hereafter "LV") banking crises (Panel C) and for banking crises based on real-time measures (Panel D). Annualized cumulative log excess returns over a 0 to 60 month horizon are first computed for all banking crises of each type in the sample; then, means and standard deviations of these cumulative 60-month returns are computed across crises, along with the percent of these observations with cumulative returns less than -50% and the average return conditional on being less than -50%. Returns are calculated for both bank and nonfinancial equity total return indexes and in both local currency units (LCU) and US dollars (USD). Quantities are tested relative to the unconditional returns in Panel A consisting of all the 0-60-month cumulative returns in the sample. The brackets contain t-statistics based on standard errors clustered on country and month. *, **, *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: Unconditional returns

Asset	Currency	Mean (annual.)	Std. dev. (annual.)	% cum. drops < -0.5	Avg. cum. drop < -0.5
Nonfinancials	USD	0.056	0.27	8.2	-0.85
	LCU	0.046	0.24	7.5	-0.80
Banks	USD	0.045	0.39	15.0	-1.24
	LCU	0.033	0.37	14.4	-1.25

Panel B: BVX panics

Asset	Currency	Mean (annual.)	Std. dev. (annual.)	% cum. drops < -0.5	Avg. cum. drop < -0.5	Diff. in means	Diff. in std. dev.	Diff. in % cum. drops < -0.5
Nonfin.	USD	0.067	0.26	4.0	-1.09	0.011 [1.02]	-0.01	-4.2 [-1.35]
	LCU	0.058	0.27	10.0	-0.86	0.016 [1.38]	0.03	2.5 [0.48]
Banks	USD	-0.062	0.62	36.0	-1.62	-0.101*** [-2.66]	0.23	21.1*** [4.36]
	LCU	-0.072	0.62	32.0	-1.83	-0.097*** [-2.58]	0.25	17.7*** [3.16]

Panel C: LV crises

Asset	Currency	Mean (annual.)	Std. dev. (annual.)	% cum. drops < -0.5	Avg. cum. drop < -0.5	Diff. in means	Diff. in std. dev.	Diff. in % cum. drops < -0.5
Nonfin.	USD	0.026	0.25	15.2	-0.87	-0.031 [-0.99]	-0.02	7.0 [0.63]
	LCU	0.021	0.24	9.1	-0.84	-0.022 [-0.83]	-0.00	1.6 [0.26]
Banks	USD	-0.121	0.46	51.5	-1.35	-0.160*** [-5.42]	0.08	36.6*** [4.82]
	LCU	-0.127	0.45	48.5	-1.38	-0.151*** [-5.78]	0.09	34.2*** [6.33]

Panel D: Banking crises based on real-time measures

Crisis	Asset	Curr.	Mean (annual.)	Std. dev. (annual.)	% cum. drops < -0.5	Avg. cum. drop < -0.5	Diff. in means	Diff. in std. dev.	Diff. in % cum. drops < -0.5
Bank eq. crashes	Nonfin.	USD	0.056	0.26	9.7	-0.91	0.001 [0.08]	-0.01	1.5 [0.53]
	Banks	USD	0.019	0.46	20.4	-1.46	-0.017 [-0.60]	0.07	5.5 [0.89]
Interbank rate spikes	Nonfin.	USD	0.046	0.31	11.6	-0.90	-0.009 [-0.57]	0.04	3.4 [0.81]
	Banks	USD	0.015	0.45	20.3	-1.35	-0.019 [-0.76]	0.06	5.3 [1.35]
Liq. support	Nonfin.	USD	0.070	0.32	8.5	-0.90	0.007 [0.49]	0.05	0.3 [0.11]
	Banks	USD	0.021	0.51	23.4	-1.44	-0.044* [-1.67]	0.12	8.4 [1.49]

Table 3: Long-horizon predictability after banking crises

This table reports coefficients from regressions, in which log cumulative total excess USD returns are regressed on crises indicators and at various horizons ranging from 1 to 60 months after the crisis. $H = 60$, for example, corresponds to total returns from investing at the end of month 0 (the month of the crisis) to the end of month 60. Standard errors are reported in parentheses below the coefficient estimates. *, **, *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: Nonfinancial equity

H	1	3	6	12	24	36	60
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$				
b	−0.12*	−0.16***	−0.24***	−0.10	0.00	−0.03	0.04
$s.e.$	(0.07)	(0.05)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.007	0.004	0.004	0.000	-0.000	-0.000	-0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BankCrisisLV}_{i,t} + u_{i,t+H}$				
b	−0.20***	−0.25***	−0.37***	−0.23	−0.11	−0.25***	−0.12
$s.e.$	(0.06)	(0.04)	(0.05)	(0.17)	(0.09)	(0.10)	(0.15)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.012	0.006	0.006	0.001	0.000	0.000	0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BankEqCrash}_{i,t} + u_{i,t+H}$				
b	−0.05*	−0.08***	−0.11*	−0.06	0.03	−0.05	0.00
$s.e.$	(0.03)	(0.03)	(0.06)	(0.09)	(0.09)	(0.06)	(0.09)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.002	0.002	0.002	0.000	-0.000	-0.000	-0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{InterbankSpike}_{i,t} + u_{i,t+H}$				
b	−0.04	−0.05	−0.08	0.04	0.06	−0.04	−0.05
$s.e.$	(0.04)	(0.04)	(0.05)	(0.05)	(0.08)	(0.07)	(0.08)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.001	0.001	0.001	0.000	0.000	-0.000	-0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{LiqSupport}_{i,t} + u_{i,t+H}$				
b	−0.01	−0.00	−0.01	0.04	0.05	−0.01	0.06
$s.e.$	(0.02)	(0.03)	(0.04)	(0.06)	(0.08)	(0.07)	(0.07)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000

Panel B: Bank equity

H	1	3	6	12	24	36	60
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$				
b	-0.21^{*}	-0.33^{**}	-0.47^{***}	-0.19^{*}	-0.24^{**}	-0.42^{**}	-0.50^{***}
$s.e.$	(0.12)	(0.13)	(0.16)	(0.11)	(0.11)	(0.19)	(0.19)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.012	0.009	0.008	0.001	0.000	0.001	0.001
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BankCrisisLV}_{i,t} + u_{i,t+H}$				
b	-0.34^{***}	-0.53^{***}	-0.78^{***}	-0.47^{*}	-0.42^{***}	-0.88^{***}	-0.77^{***}
$s.e.$	(0.10)	(0.07)	(0.09)	(0.29)	(0.09)	(0.08)	(0.14)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.020	0.015	0.015	0.003	0.001	0.004	0.002
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BankEqCrash}_{i,t} + u_{i,t+H}$				
b	-0.05^{*}	-0.11^{***}	-0.17^{*}	-0.13	-0.08	-0.17^{*}	-0.08
$s.e.$	(0.03)	(0.03)	(0.09)	(0.12)	(0.14)	(0.10)	(0.15)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.001	0.002	0.002	0.001	0.000	0.000	-0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{InterbankSpike}_{i,t} + u_{i,t+H}$				
b	-0.07^{*}	-0.13	-0.16	0.05	0.00	-0.15	-0.10
$s.e.$	(0.04)	(0.08)	(0.10)	(0.08)	(0.12)	(0.13)	(0.11)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.002	0.002	0.001	-0.000	-0.000	0.000	0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{LiqSupport}_{i,t} + u_{i,t+H}$				
b	-0.05	-0.12^{*}	-0.15	-0.03	-0.05	-0.21	-0.20
$s.e.$	(0.04)	(0.07)	(0.09)	(0.11)	(0.13)	(0.14)	(0.12)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.001	0.001	0.001	-0.000	-0.000	0.000	0.000

Table 4: Equity trading strategies around banking crises

This table reports statistics on the excess USD returns earned from various trading strategies. The first two rows correspond to the benchmark passive strategies, in which an investor invests over the entire sample without regard to banking crises. The next sets of four rows correspond to trading strategies around BVX crises, around LV crises, and around banking crises defined by the three real-time measures (bank equity crashes, interbank spread spikes, and extensive liquidity support). The strategies are computed for either nonfinancial (Panel A) or bank (Panel B) equity total return indexes, based on a USD investor who invests 100% of his or her wealth over the specified horizon in countries with a crisis (dividing the wealth equally, if more than one country is in crisis at a given time) and in U.S. T-bills otherwise. The following annualized quantities are reported based on the monthly time-series of this investor's performance: mean, volatility, Sharpe ratio, and factor alphas. "Intl. 3-factor" alpha refers to the alpha after controlling for the global equity market, size, and value factors from Karolyi and Wu (2021). "Intl. 3-factor + LRV" alpha additionally controls for three currency risk factors: the carry trade, dollar, and dollar-carry-trade factors of Lustig, Roussanov, Verdelhan (2011, 2014). *, **, *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: Nonfinancial equity

Crisis	Holding period	Mean	Volatility	Sharpe ratio	Intl. 3-factor α	Intl. 3-factor + LRV α
N/A	Passive benchmark	0.102	0.169	0.602	0.006 [0.443]	0.005 [0.433]
BVX panics	0-60 months	0.106	0.210	0.503	0.005 [0.200]	-0.001 [-0.048]
	Diff. w passive	0.004 [0.117]	0.041*** [2.830]	-0.099 [-0.385]	-0.000 [-0.011]	-0.007 [-0.242]
	6-60 months	0.129	0.204	0.635	0.047 [1.411]	0.039 [1.146]
	Diff. w passive	0.028 [0.854]	0.035** [2.155]	0.033 [0.120]	0.041 [1.220]	0.033 [0.987]
LV crises	0-60 months	0.056	0.198	0.281	-0.032 [-1.137]	-0.035 [-1.253]
	Diff. w passive	-0.046 [-1.570]	0.029 [0.143]	-0.321 [-1.231]	-0.037 [-1.511]	-0.041 [-1.597]
	6-60 months	0.074	0.193	0.385	-0.009 [-0.331]	-0.015 [-0.548]
	Diff. w passive	-0.028 [-0.951]	0.024 [0.820]	-0.218 [-0.837]	-0.015 [-0.612]	-0.020 [-0.828]
Bank equity crashes	0-60 months	0.107	0.213	0.504	-0.002 [-0.058]	-0.001 [-0.047]
	Diff. w passive	0.006 [0.196]	0.044*** [2.999]	-0.098 [-0.367]	-0.007 [-0.309]	-0.007 [-0.271]
	6-60 months	0.114	0.209	0.542	0.007 [0.270]	0.011 [0.380]
	Diff. w passive	0.012 [0.418]	0.040*** [2.667]	-0.060 [-0.219]	0.001 [0.057]	0.005 [0.216]
Interbank rate spikes	0-60 months	0.134	0.207	0.650	0.032 [1.359]	0.027 [1.150]
	Diff. w passive	0.032 [1.215]	0.037** [2.560]	0.048 [0.175]	0.026 [1.257]	0.022 [1.050]
	6-60 months	0.133	0.209	0.633	0.034 [1.203]	0.032 [1.152]
	Diff. w passive	0.031 [1.042]	0.040*** [2.696]	0.031 [0.114]	0.028 [1.079]	0.027 [1.074]
Liq. support	0-60 months	0.091	0.213	0.428	-0.010 [-0.321]	-0.011 [-0.345]
	Diff. w passive	-0.011 [-0.346]	0.044*** [2.821]	-0.175 [-0.624]	-0.016 [-0.578]	-0.016 [-0.589]
	6-60 months	0.102	0.217	0.469	-0.001 [-0.019]	-0.002 [-0.051]
	Diff. w passive	-0.000 [-0.002]	0.048*** [3.109]	-0.134 [-0.537]	-0.006 [-0.223]	-0.007 [-0.242]

Panel B: Bank equity

Crisis	Holding period	Mean	Volatility	Sharpe ratio	Intl. 3-factor α	Intl. 3-factor + LRV α
N/A	Passive benchmark	0.112	0.195	0.576	-0.004 [-0.208]	-0.007 [-0.425]
BVX panics	0-60 months	0.038	0.330	0.114	-0.114** [-2.119]	-0.125** [-2.262]
	Diff. w passive	-0.075 [-1.613]	0.135*** [5.394]	-0.462* [-1.868]	-0.110** [-2.377]	-0.118** [-2.502]
	6-60 months	0.068	0.315	0.217	-0.054 [-0.874]	-0.063 [-1.003]
	Diff. w passive	-0.044 [-0.929]	0.120*** [4.488]	-0.359 [-1.346]	-0.050 [-0.921]	-0.056 [-1.012]
LV crises	0-60 months	0.063	0.297	0.212	-0.074 [-1.573]	-0.087* [-1.762]
	Diff. w passive	-0.049 [-1.147]	0.103*** [2.862]	-0.364 [-1.524]	-0.071* [-1.804]	-0.080* [-1.948]
	6-60 months	0.089	0.289	0.309	-0.039 [-0.823]	-0.055 [-1.093]
	Diff. w passive	-0.023 [-0.511]	0.094** [2.211]	-0.267 [-1.083]	-0.036 [-0.838]	-0.048 [-1.067]
Bank equity crashes	0-60 months	0.056	0.274	0.206	-0.079* [-1.802]	-0.084* [-1.773]
	Diff. w passive	-0.056 [-1.223]	0.079*** [4.016]	-0.370 [-1.373]	-0.076* [-1.818]	-0.077* [-1.722]
	6-60 months	0.069	0.270	0.255	-0.064 [-1.418]	-0.068 [-1.417]
	Diff. w passive	-0.043 [-0.984]	0.076*** [3.343]	-0.321 [-1.202]	-0.060 [-1.491]	-0.061 [-1.413]
Interbank rate spikes	0-60 months	0.135	0.260	0.519	-0.001 [-0.029]	-0.009 [-0.296]
	Diff. w passive	0.023 [0.688]	0.065*** [4.081]	-0.057 [-0.237]	0.003 [0.101]	-0.002 [-0.076]
	6-60 months	0.143	0.261	0.549	0.019 [0.575]	0.010 [0.317]
	Diff. w passive	0.031 [0.874]	0.066*** [3.584]	-0.027 [-0.105]	0.023 [0.752]	0.017 [0.564]
Liq. support	0-60 months	0.095	0.277	0.344	-0.035 [-0.796]	-0.038 [-0.882]
	Diff. w passive	-0.017 [-0.393]	0.082*** [3.592]	-0.232 [-0.905]	-0.032 [-0.748]	-0.030 [-0.730]
	6-60 months	0.117	0.288	0.407	-0.013 [-0.305]	-0.011 [-0.246]
	Diff. w passive	0.005 [0.107]	0.093*** [3.911]	-0.169 [-0.610]	-0.010 [-0.221]	-0.003 [-0.077]

Table 5: What explains the low returns after banking crises?

This table reports estimated parameters β at various horizons h from the equation $\Delta_{t,t+h} \log \text{Total Returns}_{it} = \alpha_i + \beta X_{it} + \gamma Z_{it} + \varepsilon_{ist}$, where X_{it} is the variable of interest and Z_{it} denotes the control variables. The variables of interest in Panel A are, alternately: lagged 3-year change in household debt to GDP, lagged bank capitalization, and 3-year lead change in NPL ratio. The variables of interest in Panel B are the policy and macro variables described in the main text. All the variables of interest are standardized; thus, estimates correspond to the average change in subsequent returns associated with one-standard-deviation increase in one of the regressors. t-statistics calculated from heteroskedasticity-robust standard errors are reported in square brackets. *, **, *** indicate significance at 0.1, 0.05 and 0.01 level respectively.

Panel A: Debt overhang variables

	Nonfinancial equity			Bank equity		
Horizon:	12	36	60	12	36	60
$\Delta_{t-4,t-1}$ Household Debt	-0.055	-0.058	-0.094	-0.221**	-0.406*	-0.553**
	[-1.177]	[-0.792]	[-0.889]	[-2.551]	[-1.949]	[-1.994]
Adj. R^2	-0.01	0.11	-0.00	0.06	0.36	0.19
N	38	38	38	38	38	38
Low bank capitalization$_{t-1}$	0.233	-0.013	-0.289	-0.092	-0.408	-0.977**
	[1.310]	[-0.113]	[-0.895]	[-0.286]	[-1.598]	[-2.100]
Adj. R^2	-0.03	0.21	0.13	-0.07	0.25	0.23
N	33	33	33	33	33	33
$\Delta_{t-1,t+1}$ NPL	-0.089	-0.124**	-0.176*	-0.205	-0.422***	-0.738**
	[-1.200]	[-1.985]	[-1.707]	[-1.617]	[-4.519]	[-2.302]
Adj. R^2	0.35	0.08	0.12	0.06	0.30	0.21
N	34	34	34	34	34	34

Panel B: Policy and macro variables

	Nonfinancial equity			Bank equity		
Horizon:	12	36	60	12	36	60
Monetary policy	0.017	0.002	-0.004	-0.068	-0.178**	-0.305**
	[0.285]	[0.033]	[-0.057]	[-0.596]	[-1.963]	[-2.018]
Adj. R^2	-0.05	0.05	-0.00	-0.06	0.18	0.09
N	46	46	46	46	46	46
Fiscal policy	0.013	-0.045	-0.102	0.018	0.009	-0.261
	[0.210]	[-0.701]	[-1.101]	[0.133]	[0.048]	[-0.814]
Adj. R^2	-0.02	0.14	0.10	-0.07	0.14	0.09
N	46	46	46	46	46	46
$\Delta_{t-4,t-1}$ log Real GDP	-0.024	-0.071	-0.123	0.056	-0.020	0.142
	[-0.290]	[-0.809]	[-0.881]	[0.431]	[-0.153]	[0.458]
Adj. R^2	-0.03	0.04	-0.01	-0.04	0.16	0.08
N	49	49	49	49	49	49
$\Delta_{t-4,t-1}$Current account	-0.027	-0.006	0.033	0.011	0.111	0.220
	[-0.389]	[-0.082]	[0.232]	[0.082]	[0.733]	[0.932]
Adj. R^2	-0.02	0.13	0.10	-0.08	0.12	0.06
N	42	42	42	42	42	42

Table 6: Low returns after banking crises are driven by the cash-flow effect

This table is similar to Table 5 but with an alternate dependent variable, $\Delta_{t,t+h} \log \text{Dividends}_{it}$. t-statistics calculated from heteroskedasticity-robust standard errors are reported in square brackets. *, **, *** indicate significance at 0.1, 0.05 and 0.01 level respectively.

Panel A: Debt overhang variables

	Nonfinancial equity			Bank equity		
Horizon:	12	36	60	12	36	60
$\Delta_{t-4,t-1}$ Household Debt	0.088	-0.085	-0.053	0.065	-0.145	-0.167
	[1.230]	[-0.884]	[-0.448]	[0.384]	[-0.900]	[-0.960]
Adj. R^2	-0.04	-0.06	-0.06	0.09	0.03	0.10
N	38	38	38	38	38	38
Low bank capitalization$_{t-1}$	0.243**	-0.025	-0.313**	0.044	-0.311	-0.682**
	[2.028]	[-0.189]	[-2.169]	[0.097]	[-0.897]	[-2.426]
Adj. R^2	-0.06	-0.07	0.10	0.07	0.16	0.31
N	33	33	33	33	33	33
$\Delta_{t-1,t+1}$ NPL	-0.066	-0.135	0.020	-0.169	-0.323**	-0.262
	[-0.737]	[-1.013]	[0.170]	[-1.598]	[-1.996]	[-1.445]
Adj. R^2	-0.08	-0.02	0.02	-0.03	0.06	-0.01
N	34	34	34	34	34	34

Panel B: Policy and macro variables

	Nonfinancial equity			Bank equity		
Horizon:	12	36	60	12	36	60
Monetary policy	-0.038	0.009	0.016	-0.206**	-0.161	-0.143
	[-0.493]	[0.100]	[0.135]	[-2.219]	[-1.166]	[-1.599]
Adj. R^2	-0.02	0.02	0.12	0.16	0.05	0.08
N	46	46	46	46	46	46
Fiscal policy	0.012	-0.046	-0.102	0.173	0.222	0.092
	[0.184]	[-0.668]	[-1.581]	[1.344]	[1.240]	[0.480]
Adj. R^2	-0.04	-0.05	0.04	0.13	0.03	0.09
N	46	46	46	46	46	46
$\Delta_{t-4,t-1}$ log Real GDP	-0.009	-0.099	-0.103	0.036	-0.055	0.050
	[-0.086]	[-0.923]	[-0.893]	[0.353]	[-0.403]	[0.300]
Adj. R^2	-0.01	0.00	0.08	0.13	0.03	0.09
N	49	49	49	49	49	49
$\Delta_{t-4,t-1}$Current account	0.065	0.043	0.140	0.033	0.227	0.349**
	[0.730]	[0.553]	[1.202]	[0.215]	[1.468]	[2.240]
Adj. R^2	-0.04	-0.07	0.04	0.08	-0.00	0.14
N	42	42	42	42	42	42

Appendix A. Additional results

Figure A.1: Frequency of various crises over time

This figure plots the frequency of various types of crises over time. These crises are defined in Section I.

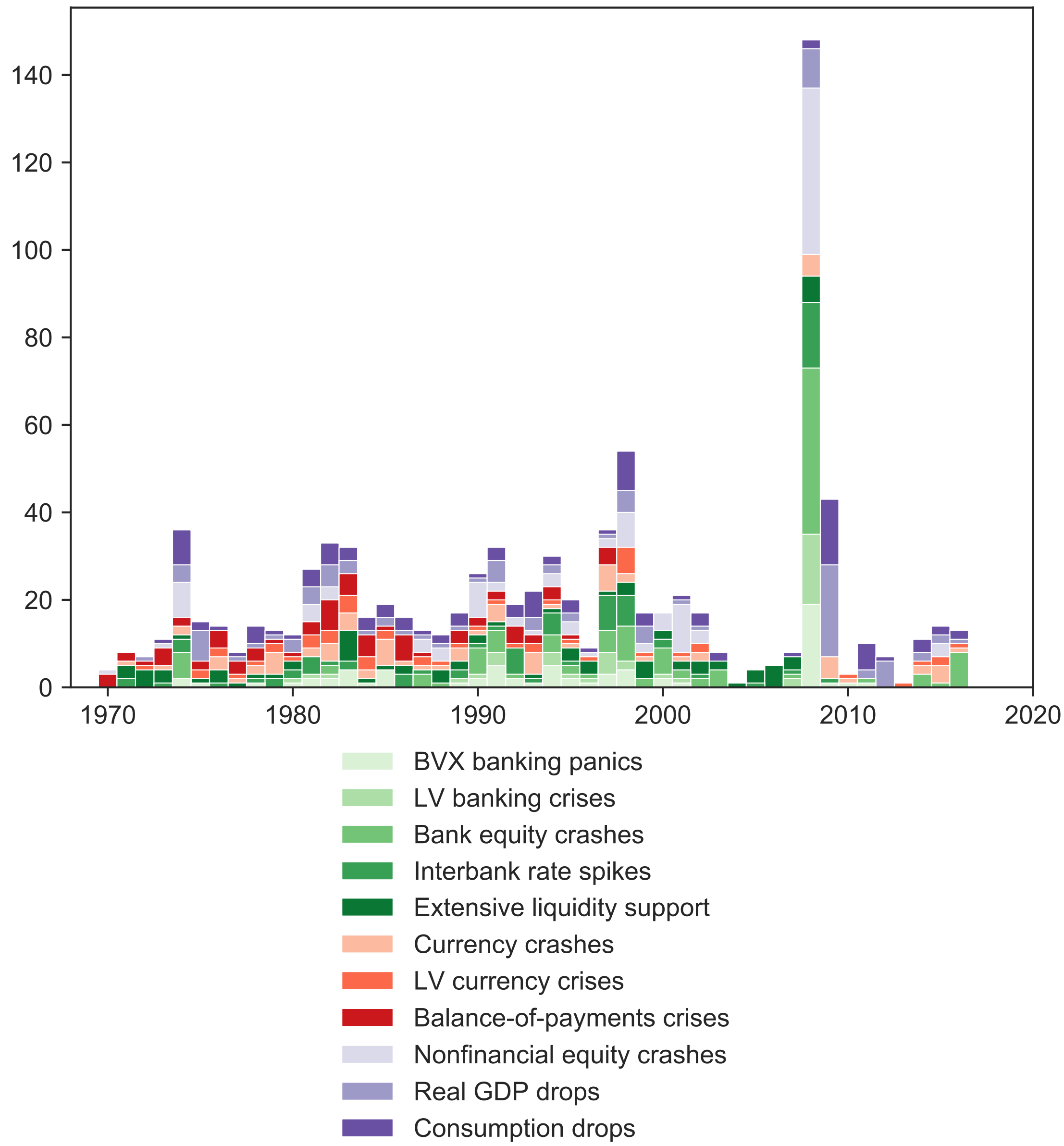


Figure A.2: Equity returns with perfect timing of troughs around banking crises

This figure plots BHARs around BVX panics where each episode's BHAR is computed in excess USD returns relative to the local trough of the bank equity returns index (and relative to the BVX panic month if bank equity returns do not have a trough around a crisis episode).

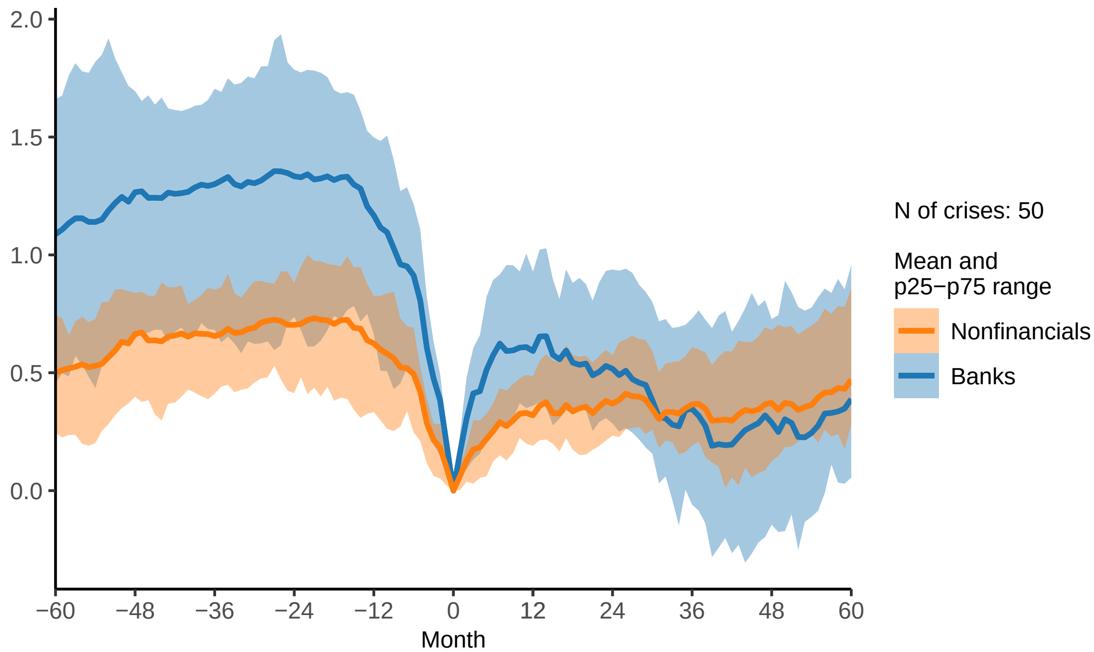
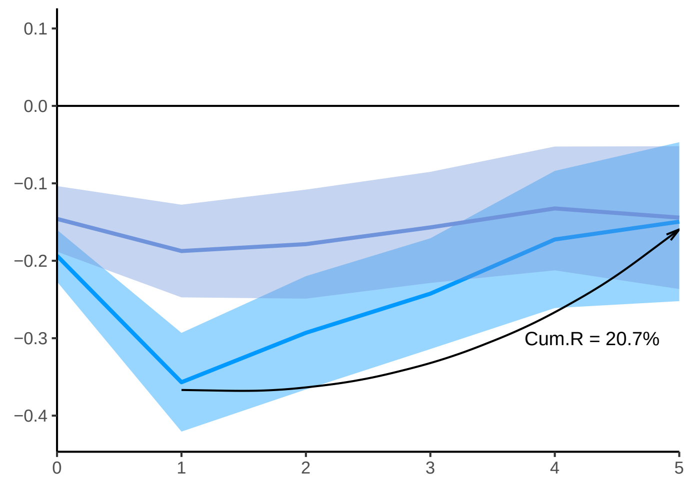


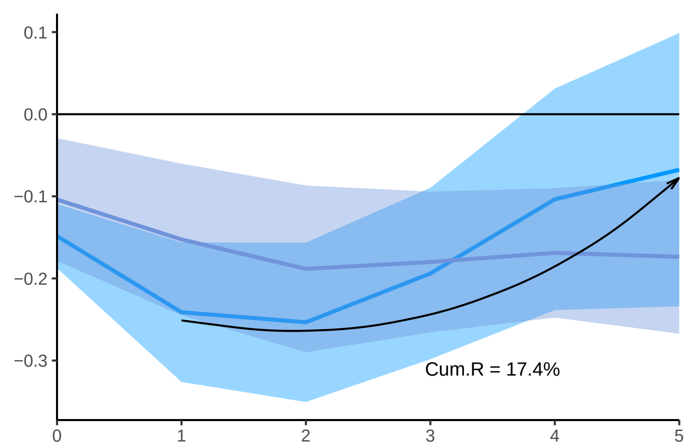
Figure A.3: Replication of Muir's (2017) results on realized returns after crises

This figure replicates the upper right subpanel of Figure 2 in Muir (2017). The blue line corresponds to Jorda, Schularick, and Taylor (2011) (JST) financial crises, and the purple line corresponds to JST "normal recessions." The shaded areas correspond to 90% confidence bands, as in Muir (2017).

(A) Full sample



(B) Pre-World War II sample



(C) Post-World War II sample

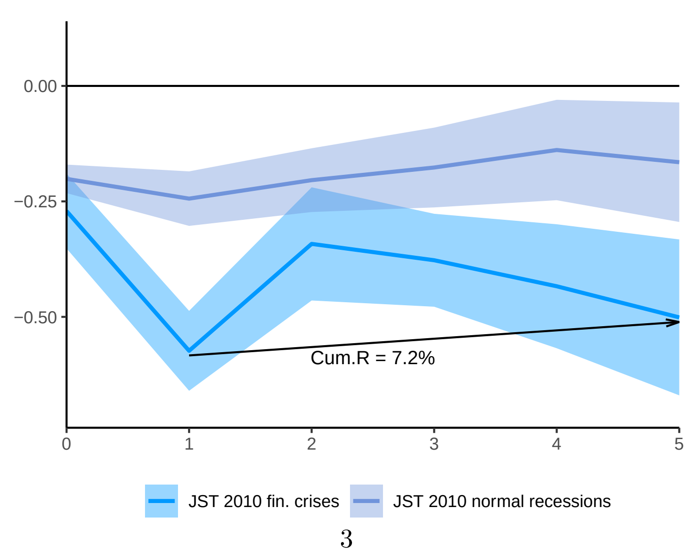


Table A.1: Long-horizon predictability after banking crises: in LCU

This table is similar to Table 3 and reports coefficients from regressing cumulative log total returns in local currency units (LCU) on select crises indicators and at various horizons ranging from 1 to 60 months after the crisis. *, **, *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: Nonfinancial equity

H	1	3	6	12	24	36	60
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$						
b	−0.09*	−0.13***	−0.17***	−0.07	0.04	0.00	0.13**
$s.e.$	(0.05)	(0.04)	(0.06)	(0.05)	(0.05)	(0.07)	(0.06)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.004	0.003	0.002	0.000	-0.000	-0.000	0.000
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BankCrisisLV}_{i,t} + u_{i,t+H}$						
b	−0.12***	−0.15***	−0.19***	−0.16	−0.03	−0.18**	−0.07
$s.e.$	(0.04)	(0.06)	(0.06)	(0.11)	(0.07)	(0.08)	(0.13)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.006	0.003	0.002	0.001	-0.000	0.000	-0.000
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BankEqCrash}_{i,t} + u_{i,t+H}$						
b	−0.04*	−0.05*	−0.06	−0.05	0.02	−0.05	−0.02
$s.e.$	(0.02)	(0.03)	(0.05)	(0.06)	(0.07)	(0.05)	(0.07)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.002	0.001	0.001	0.000	-0.000	0.000	-0.000
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{InterbankSpike}_{i,t} + u_{i,t+H}$						
b	−0.03	−0.04	−0.07	0.03	0.06	−0.02	0.01
$s.e.$	(0.03)	(0.04)	(0.04)	(0.04)	(0.06)	(0.05)	(0.07)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.001	0.000	0.000	-0.000	0.000	-0.000	-0.000
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{LiqSupport}_{i,t} + u_{i,t+H}$						
b	−0.01	−0.00	0.01	0.03	0.02	−0.04	0.03
$s.e.$	(0.01)	(0.02)	(0.04)	(0.05)	(0.08)	(0.07)	(0.07)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000

Panel B: Bank equity

H	1	3	6	12	24	36	60
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$				
b	−0.17*	−0.30**	−0.41***	−0.16*	−0.20**	−0.39**	−0.42**
$s.e.$	(0.09)	(0.13)	(0.15)	(0.09)	(0.10)	(0.19)	(0.20)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.010	0.009	0.007	0.001	0.000	0.001	0.001
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BankCrisisLV}_{i,t} + u_{i,t+H}$				
b	−0.26***	−0.44***	−0.60***	−0.41*	−0.34***	−0.81***	−0.73***
$s.e.$	(0.08)	(0.11)	(0.10)	(0.23)	(0.07)	(0.09)	(0.13)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.015	0.012	0.010	0.002	0.001	0.003	0.002
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BankEqCrash}_{i,t} + u_{i,t+H}$				
b	−0.04*	−0.08***	−0.12	−0.12	−0.09	−0.17**	−0.10
$s.e.$	(0.02)	(0.03)	(0.08)	(0.10)	(0.11)	(0.09)	(0.13)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.001	0.001	0.001	0.001	0.000	0.000	0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{InterbankSpike}_{i,t} + u_{i,t+H}$				
b	−0.06**	−0.12*	−0.15	0.04	0.00	−0.13	−0.05
$s.e.$	(0.03)	(0.07)	(0.10)	(0.07)	(0.11)	(0.12)	(0.11)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.002	0.002	0.001	-0.000	-0.000	0.000	-0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{LiqSupport}_{i,t} + u_{i,t+H}$				
b	−0.05	−0.12*	−0.14	−0.05	−0.08	−0.24*	−0.23*
$s.e.$	(0.03)	(0.06)	(0.08)	(0.09)	(0.12)	(0.13)	(0.12)
N	14,712	14,712	14,712	14,712	14,712	14,712	14,712
R^2	0.001	0.001	0.001	-0.000	0.000	0.000	0.000

Table A.2: Credit crunches and return predictability

This table reports estimated parameters β at various horizons h from the equation $\Delta_{t,t+h} \log \text{Total Returns}_{it} = \alpha_i + \beta' D_{it} + \varepsilon_{it}$, where $\Delta_{t,t+h} \log \text{Total Returns}_{it}$ is h-month-ahead cumulative total return on nonfinancial or bank equity, and D_{it} stands for a vector of crisis indicators. These indicators are, alternately: BVX panics in Panel A, credit crunches in Panel B, and credit crunches split into those within two years of BVX crises and those more than two years away from BVX crises in Panel C. A credit crunch is defined as a December month at the end of a year with negative real credit growth. (Real credit growth is taken from Baron, Verner, and Xiong (2021) and is only available on an annual basis.) In case of many such observations clustered together, we keep only the first credit crunch in any 5-year window. t-statistics calculated from standard errors clustered at the country level are reported in square brackets. *, **, *** indicate significance at 0.1, 0.05 and 0.01 level respectively.

Panel A: Return predictability after BVX panics

	Nonfinancial equity			Bank equity		
Horizon:	12	36	60	12	36	60
BVX panics	-0.075*	-0.008	0.068	-0.148**	-0.387***	-0.504***
	[-1.778]	[-0.169]	[1.151]	[-1.967]	[-3.763]	[-2.730]
N	16575	15339	14155	16575	15339	14155
R^2	0.000	0.000	0.000	0.000	0.001	0.001

Panel B: Return predictability after credit crunches

	Nonfinancial equity			Bank equity		
Horizon:	12	36	60	12	36	60
Credit crunch	0.094***	0.107***	0.207***	0.010	-0.015	0.159***
	[2.616]	[2.660]	[4.833]	[0.223]	[-0.328]	[3.063]
N	16575	15339	14155	16575	15339	14155
R^2	0.001	0.000	0.001	0.000	0.000	0.000

Panel C: BVX-associated vs. other credit crunches

	Nonfinancial equity			Bank equity		
Horizon:	12	36	60	12	36	60
Non-BVX credit crunch	0.120**	0.221***	0.306***	0.102**	0.254***	0.442***
	[2.537]	[3.493]	[4.063]	[2.095]	[3.843]	[5.293]
BVX credit crunch	0.062	-0.030	0.087	-0.101	-0.340***	-0.183*
	[1.388]	[-0.501]	[1.405]	[-1.508]	[-3.702]	[-1.727]
N	16575	15339	14155	16575	15339	14155
R^2	0.001	0.001	0.001	0.000	0.001	0.001

Table A.3: Equity returns after other types of crises

This table is similar to Table 2 but reports returns around various other types of crises defined in Section I.

Crisis	Asset	Mean (annual.)	Std. dev. (annual.)	% cum. drops < -0.5	Avg. cum. drop < -0.5	Diff. in means	Diff. in std. dev.	Diff. in % cum. drops < -0.5
Currency crashes	Nonfin.	0.110	0.29	8.3	-1.15	0.066*** [3.34]	0.03	0.2 [0.04]
	Banks	0.117	0.41	8.3	-1.67	0.071** [2.30]	0.02	-6.7 [-1.41]
LV currency crises	Nonfin.	0.086	0.40	15.8	-0.97	0.054 [1.32]	0.13	7.6 [0.91]
	Banks	0.079	0.44	15.8	-1.01	0.048 [1.01]	0.05	0.8 [0.09]
Balance-of-payments crises	Nonfin.	0.111	0.45	16.0	-0.94	0.039 [0.88]	0.18	7.8 [0.99]
	Banks	0.075	0.54	12.0	-2.09	0.019 [0.32]	0.15	-3.0 [-0.39]
Nonfinancial equity crashes	Nonfin.	0.079	0.24	6.9	-0.88	0.030*** [2.87]	-0.03	-1.2 [-0.45]
	Banks	0.064	0.39	9.9	-1.59	0.024 [1.38]	-0.00	-5.1** [-2.12]
Real GDP drops	Nonfin.	0.067	0.22	4.5	-1.13	0.015 [0.87]	-0.05	-3.6** [-2.49]
	Banks	0.032	0.45	22.7	-1.29	-0.006 [-0.12]	0.06	7.8 [0.87]
Consumption drops	Nonfin.	0.081	0.27	4.4	-1.16	0.033* [1.77]	0.00	-3.8*** [-3.05]
	Banks	0.064	0.39	16.2	-1.26	0.028 [1.22]	0.00	1.2 [0.31]

Table A.4: Long-horizon predictability after other types of crises

This table is similar to Table 3 and reports coefficients from regressing cumulative log total USD returns on select crises indicators and at various horizons ranging from 1 to 60 months after the crisis. *, **, *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A: Nonfinancial equity

H	1	3	6	12	24	36	60
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{CurrCrash}_{i,t} + u_{i,t+H}$						
b	-0.01	-0.04	-0.01	0.01	0.21**	0.16**	0.40***
$s.e.$	(0.01)	(0.03)	(0.05)	(0.08)	(0.09)	(0.08)	(0.07)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.000	0.000	-0.000	-0.000	0.001	0.000	0.002
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{CurrCrisisLV}_{i,t} + u_{i,t+H}$						
b	0.04	0.01	-0.12	0.23*	0.61***	0.33***	0.63***
$s.e.$	(0.08)	(0.11)	(0.11)	(0.13)	(0.19)	(0.10)	(0.17)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.000	-0.000	0.000	0.000	0.001	0.000	0.001
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BoPaymentCrisis}_{i,t} + u_{i,t+H}$						
b	-0.01	-0.07	-0.04	-0.13	0.16	0.10	0.24
$s.e.$	(0.05)	(0.10)	(0.13)	(0.21)	(0.11)	(0.16)	(0.21)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	-0.000	0.000	-0.000	0.000	0.000	-0.000	0.000
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{NonfinEqCrash}_{i,t} + u_{i,t+H}$						
b	-0.03	-0.07***	-0.11***	-0.05	-0.04	-0.07*	0.03
$s.e.$	(0.02)	(0.03)	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.002	0.003	0.003	0.000	0.000	0.000	-0.000
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{RealGDPDrop}_{i,t} + u_{i,t+H}$						
b	-0.01	0.04*	0.01	-0.00	0.08	0.03	0.07
$s.e.$	(0.02)	(0.03)	(0.09)	(0.14)	(0.13)	(0.09)	(0.08)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.000	0.000	-0.000	-0.000	0.000	-0.000	0.000
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{RealConsDrop}_{i,t} + u_{i,t+H}$						
b	-0.02	0.05**	-0.00	-0.01	0.10	0.05	0.16*
$s.e.$	(0.02)	(0.02)	(0.07)	(0.08)	(0.08)	(0.06)	(0.09)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.000	0.001	-0.000	-0.000	0.000	-0.000	0.000

Panel B: Bank equity

H	1	3	6	12	24	36	60
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{CurrCrash}_{i,t} + u_{i,t+H}$				
b	-0.04*	-0.03	0.02	0.02	0.22**	0.14	0.52***
$s.e.$	(0.02)	(0.06)	(0.08)	(0.12)	(0.11)	(0.09)	(0.11)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.001	0.000	-0.000	-0.000	0.001	0.000	0.001
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{CurrCrisisLV}_{i,t} + u_{i,t+H}$				
b	-0.01	-0.03	-0.28**	0.19**	0.54***	0.26	0.55**
$s.e.$	(0.07)	(0.11)	(0.12)	(0.09)	(0.17)	(0.25)	(0.27)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	-0.000	-0.000	0.000	0.000	0.000	0.000	0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BoPaymentCrisis}_{i,t} + u_{i,t+H}$				
b	-0.05	-0.17	-0.19	-0.27	0.00	-0.06	0.11
$s.e.$	(0.06)	(0.15)	(0.19)	(0.32)	(0.14)	(0.19)	(0.27)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.000	0.001	0.000	0.000	-0.000	-0.000	-0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{NonfinEqCrash}_{i,t} + u_{i,t+H}$				
b	-0.05*	-0.11***	-0.15***	-0.06	-0.06	-0.08*	-0.01
$s.e.$	(0.03)	(0.03)	(0.06)	(0.05)	(0.07)	(0.05)	(0.07)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.002	0.003	0.003	0.000	0.000	0.000	-0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{RealGDPDrop}_{i,t} + u_{i,t+H}$				
b	-0.02	0.09*	0.05	-0.03	0.06	-0.11	-0.06
$s.e.$	(0.04)	(0.05)	(0.15)	(0.24)	(0.21)	(0.15)	(0.23)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.000	0.001	0.000	-0.000	-0.000	0.000	-0.000
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{RealConsDrop}_{i,t} + u_{i,t+H}$				
b	-0.05	0.07**	0.02	-0.01	0.03	-0.09	0.10
$s.e.$	(0.04)	(0.03)	(0.12)	(0.14)	(0.12)	(0.08)	(0.11)
N	14,822	14,822	14,822	14,822	14,822	14,822	14,822
R^2	0.001	0.001	-0.000	-0.000	-0.000	0.000	0.000

Table A.5: Returns on other asset classes after banking crises

This table is similar to Table 2 but reports returns of other asset classes.

Asset	Crisis	Mean (annual.)	Std. dev. (annual.)	% cum. drops < -0.5	Avg. cum. drop < -0.5	Diff. in means	Diff. in std. dev.	Diff. in % cum. drops < -0.5
EMBI sovereign bonds	BVX panics	0.061	0.17	10.0	-0.72	-0.000	0.04	7.4
						[-0.03]		[1.11]
	LV crises	0.069	0.09	0.0		0.009	-0.04	-2.6
						[1.04]		[-1.02]
	Bank equity crashes	0.073	0.14	4.5	-0.84	0.005	0.01	2.0
						[0.61]		[0.97]
	Interbank rate spikes	0.054	0.25	14.3	-0.91	-0.008	0.12	11.8
						[-0.33]		[1.48]
	Ext. liquidity support	0.070	0.12	0.0		0.002	-0.02	-2.6
						[0.22]		[-1.03]
Currency carry-trades	BVX panics	-0.006	0.26	5.9	-1.57	-0.016	0.12	2.6
						[-1.24]		[0.73]
	LV crises	0.004	0.12	3.0	-0.64	-0.011	-0.02	-0.3
						[-1.32]		[-0.10]
	Bank equity crashes	0.013	0.12	2.1	-0.97	0.004	-0.02	-1.2
						[0.99]		[-1.06]
	Interbank rate spikes	0.001	0.14	8.7	-0.59	-0.013**	0.00	5.4
						[-2.55]		[1.44]
	Ext. liquidity support	0.017	0.16	6.1	-0.61	0.011	0.01	2.8
						[1.29]		[0.86]
Residential real estate	BVX panics	-0.035	0.15	17.1	-0.73	-0.044**	-0.04	8.8
						[-2.20]		[0.93]
	LV crises	-0.024	0.13	11.5	-0.59	-0.030**	-0.06	3.0
						[-2.40]		[0.40]
	Bank equity crashes	0.014	0.16	4.2	-0.65	0.003	-0.03	-4.8**
						[0.29]		[-2.05]
	Interbank rate spikes	-0.011	0.23	17.6	-0.86	-0.026**	0.04	9.5*
						[-2.26]		[1.79]
	Ext. liquidity support	0.033	0.23	8.8	-0.91	0.018**	0.03	0.2
						[2.04]		[0.05]

Table A.6: Equity trading strategies around other types of crises

This table is similar to Table 4 but reports results for trading strategies around other types of crises defined in Section I.

Crisis	Asset	Holding period	Mean	Volatility	Sharpe ratio	Int. 3-factor α	Int. 3-factor + LRV α
N/A	Nonfinancials	Passive benchmark	0.102	0.169	0.602	0.006	0.005
						[0.443]	[0.433]
	Banks	Passive benchmark	0.112	0.195	0.576	-0.004	-0.007
						[-0.208]	[-0.425]
Currency crashes	Nonfinancials	6-60 months	0.190	0.280	0.680	0.102**	0.093**
						[2.374]	[2.163]
		Diff. w passive	0.088**	0.110***	0.077	0.096**	0.087**
			[2.157]	[4.078]	[0.311]	[2.429]	[2.160]
	Banks	6-60 months	0.231	0.301	0.766	0.129**	0.125**
						[2.523]	[2.383]
		Diff. w passive	0.118***	0.106***	0.190	0.132***	0.133***
			[2.586]	[3.618]	[0.788]	[3.225]	[3.112]
LV currency crises	Nonfinancials	6-60 months	0.184	0.304	0.605	0.120**	0.118**
						[2.380]	[2.311]
		Diff. w passive	0.082*	0.135***	0.003	0.115**	0.112**
			[1.666]	[5.476]	[0.010]	[2.444]	[2.344]
	Banks	6-60 months	0.236	0.348	0.679	0.175***	0.189***
						[2.846]	[2.963]
		Diff. w passive	0.124**	0.153***	0.103	0.178***	0.196***
			[2.184]	[5.022]	[0.427]	[3.189]	[3.300]
Balance-of-payments crises	Nonfinancials	6-60 months	0.105	0.180	0.584	0.059*	0.058*
						[1.861]	[1.900]
		Diff. w passive	0.003	0.011**	-0.019	0.053*	0.052*
			[0.101]	[2.301]	[-0.071]	[1.848]	[1.908]
	Banks	6-60 months	0.087	0.226	0.387	0.054	0.045
						[1.323]	[1.138]
		Diff. w passive	-0.025	0.031*	-0.189	0.058	0.052
			[-0.509]	[1.776]	[-0.703]	[1.376]	[1.304]
Nonfinancial equity crashes	Nonfinancials	6-60 months	0.128	0.197	0.652	0.040	0.035
						[1.182]	[1.076]
		Diff. w passive	0.027	0.028	0.049	0.034	0.030
			[0.998]	[0.923]	[0.179]	[1.178]	[1.082]
	Banks	6-60 months	0.135	0.224	0.604	0.029	0.027
						[0.865]	[0.789]
		Diff. w passive	0.023	0.029	0.028	0.033	0.034
			[0.730]	[1.122]	[0.108]	[1.048]	[1.064]

Table A.6 – cont.

Crisis	Asset	Holding period	Mean	Volatility	Sharpe ratio	Int. 3-factor α	Int. 3-factor + LRV α
Real GDP drops	Nonfinancials	6-60 months	0.097	0.211	0.459	0.006	0.003
						[0.226]	[0.111]
		Diff. w passive	-0.005	0.042	-0.143	0.000	-0.002
			[-0.169]	[1.440]	[-0.501]	[0.017]	[-0.089]
	Banks	6-60 months	0.117	0.269	0.437	-0.005	-0.016
						[-0.143]	[-0.424]
		Diff. w passive	0.005	0.074***	-0.139	-0.002	-0.009
			[0.141]	[3.177]	[-0.555]	[-0.053]	[-0.268]
Consumption drops	Nonfinancials	6-60 months	0.131	0.196	0.668	0.027	0.026
						[1.280]	[1.221]
		Diff. w passive	0.029	0.026**	0.065	0.021	0.020
			[1.135]	[2.572]	[0.248]	[1.171]	[1.123]
	Banks	6-60 months	0.133	0.247	0.538	0.008	0.003
						[0.251]	[0.083]
		Diff. w passive	0.021	0.052***	-0.038	0.011	0.010
			[0.623]	[3.839]	[-0.141]	[0.416]	[0.355]

Table A.7: Trading other asset classes around banking crises

This table is similar to Table 4 but reports results for trading strategies around banking crises for various other asset classes (EMBI sovereign bonds in Panel A, currency carry trades in Panel B, and residential real estate in Panel C).

Panel A: EMBI sovereign bonds

Crisis	Holding period	Mean	Volatility	Sharpe ratio	Int. 3-factor α	Int. 3-factor + LRV α
N/A	Passive benchmark	0.071	0.114	0.619	0.060**	0.053**
					[2.423]	[2.056]
BVX banking panics	6-60 months	0.082	0.124	0.660	0.076***	0.069**
					[2.818]	[2.372]
	Diff. w passive	0.011	0.010	0.041	0.016	0.016
		[0.438]	[0.959]	[0.129]	[0.586]	[0.571]
LV banking crises	6-60 months	0.093	0.106	0.880	0.088***	0.083***
					[4.224]	[3.665]
	Diff. w passive	0.023	-0.008	0.261	0.028	0.030
		[1.015]	[0.785]	[0.766]	[1.158]	[1.227]
Bank equity crashes	6-60 months	0.059	0.119	0.498	0.047	0.043
					[1.504]	[1.438]
	Diff. w passive	-0.012	0.004	-0.121	-0.013	-0.010
		[-0.463]	[0.683]	[-0.357]	[-0.457]	[-0.351]
Interbank rate spikes	6-60 months	0.073	0.194	0.378	0.056	0.049
					[1.062]	[1.008]
	Diff. w passive	0.003	0.079***	-0.241	-0.003	-0.004
		[0.066]	[2.939]	[-0.719]	[-0.077]	[-0.100]
Ext. liquidity support	6-60 months	0.067	0.106	0.629	0.058**	0.048*
					[2.434]	[1.934]
	Diff. w passive	-0.004	-0.008	0.010	-0.002	-0.004
		[-0.198]	[0.891]	[0.028]	[-0.098]	[-0.212]

Panel B: Currency carry-trades

Crisis	Holding period	Mean	Volatility	Sharpe ratio	Int. 3-factor α	Int. 3-factor + LRV α
N/A	Passive benchmark	0.020	0.070	0.284	-0.006	0.007*
					[-0.402]	[1.861]
BVX banking panics	6-60 months	0.002	0.075	0.026	-0.020	-0.016
					[-1.207]	[-1.001]
	Diff. w passive	-0.018	0.005	-0.258	-0.015	-0.023*
		[-1.404]	[1.581]	[-1.037]	[-1.047]	[-1.830]
LV banking crises	6-60 months	0.032	0.072	0.445	0.012	0.013
					[0.860]	[1.060]
	Diff. w passive	0.012	0.001***	0.161	0.018	0.005
		[0.840]	[2.876]	[0.670]	[1.205]	[0.455]
Bank equity crashes	6-60 months	0.021	0.074	0.281	-0.001	0.011
					[-0.087]	[1.217]
	Diff. w passive	0.001	0.004	-0.003	0.004	0.003
		[0.095]	[0.745]	[-0.014]	[0.430]	[0.405]
Interbank rate spikes	6-60 months	0.039	0.083	0.474	0.018	0.026**
					[1.156]	[2.391]
	Diff. w passive	0.020	0.013	0.190	0.023**	0.018*
		[1.613]	[1.580]	[0.763]	[1.989]	[1.887]
Ext. liquidity support	6-60 months	0.033	0.096	0.339	0.009	0.019
					[0.479]	[1.208]
	Diff. w passive	0.013	0.026**	0.055	0.015	0.012
		[0.860]	[2.447]	[0.224]	[0.933]	[0.762]

Panel C: Residential real estate

Crisis	Holding period	Mean	Volatility	Sharpe ratio	Int. 3-factor α	Int. 3-factor + LRV α
N/A	Passive benchmark	0.028	0.100	0.282	-0.004 [-0.196]	0.016 [1.412]
BVX banking panics	6-60 months	-0.032	0.087	-0.373	-0.037** [-2.438]	-0.033 [-1.368]
	Diff. w passive	-0.061** [-2.625]	-0.013 [1.227]	-0.655*** [-2.621]	-0.033 [-1.368]	-0.049** [-2.156]
LV banking crises	6-60 months	-0.014	0.077	-0.185	-0.021 [-1.380]	-0.024 [-1.246]
	Diff. w passive	-0.042* [-1.776]	-0.024** [2.587]	-0.467* [-1.819]	-0.017 [-0.632]	-0.040** [-2.021]
Bank equity crashes	6-60 months	0.015	0.102	0.142	-0.009 [-0.656]	0.008 [0.638]
	Diff. w passive	-0.014 [-0.874]	0.002 [0.063]	-0.140 [-0.546]	-0.006 [-0.373]	-0.008 [-0.716]
Interbank rate spikes	6-60 months	0.032	0.125	0.259	-0.007 [-0.336]	0.010 [0.493]
	Diff. w passive	0.004 [0.192]	0.025 [1.031]	-0.023 [-0.094]	-0.003 [-0.194]	-0.005 [-0.439]
Ext. liquidity support	6-60 months	0.030	0.126	0.237	0.007 [0.291]	0.026 [0.967]
	Diff. w passive	0.002 [0.094]	0.026 [0.759]	-0.045 [-0.187]	0.011 [0.633]	0.010 [0.595]

Table A.8: Excess returns, prices, and dividends around banking crises

This table reports coefficient estimates from the regression equations displayed in the table.

Panel A: Nonfinancials

H	12	24	36	60	120
			Cumulative excess total returns		
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$		
b	-0.06	0.07	0.00	0.14*	0.18
$s.e.$	(0.05)	(0.06)	(0.08)	(0.08)	(0.12)
N	12,294	12,294	12,294	12,294	12,294
R^2	0.000	0.000	0.000	0.000	0.000
			Log price-dividend ratio		
			$\text{Price-dividend ratio}_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$		
b	0.07	0.22*	0.14	0.04	-0.01
$s.e.$	(0.10)	(0.12)	(0.15)	(0.06)	(0.06)
N	17,527	17,527	17,527	17,527	17,527
R^2	0.000	0.001	0.000	0.000	0.000
			Log dividends		
			$\sum_{h=1}^{H} \Delta d_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$		
b	-0.13***	-0.20***	-0.18***	-0.15**	0.12
$s.e.$	(0.04)	(0.04)	(0.03)	(0.06)	(0.09)
N	12,265	12,265	12,265	12,265	12,265
R^2	0.002	0.002	0.001	0.001	0.000

Panel B: Banks

H	12	24	36	60	120
			Cumulative excess total returns		
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$		
b	-0.13	-0.16	-0.41**	-0.44**	0.21*
$s.e.$	(0.10)	(0.10)	(0.18)	(0.21)	(0.12)
N	12,265	12,265	12,265	12,265	12,265
R^2	0.000	0.000	0.001	0.001	0.000
			Log price-dividend ratio		
			$\text{Price-dividend ratio}_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$		
b	0.22	0.36**	0.40***	0.21	0.03
$s.e.$	(0.32)	(0.18)	(0.13)	(0.16)	(0.08)
N	16,972	16,972	16,972	16,972	16,972
R^2	0.000	0.001	0.001	0.000	0.000
			Log dividends		
			$\sum_{h=1}^{H} \Delta d_{i,t+h} = a_i + b\text{BVXpanics}_{i,t} + u_{i,t+H}$		
b	-0.36***	-0.39***	-0.38***	-0.36**	0.03
$s.e.$	(0.10)	(0.08)	(0.10)	(0.15)	(0.10)
N	10,929	10,929	10,929	10,929	10,929
R^2	0.006	0.003	0.003	0.001	0.000

Panel C: JST data

H	1	3	5	7	10
			Cumulative excess total returns		
			$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{FinCrisis}_{i,t} + u_{i,t+H}$		
b	-0.00	0.01	0.09	0.13	0.09
$s.e.$	(0.05)	(0.05)	(0.07)	(0.08)	(0.08)
N	2,031	2,031	2,007	1,959	1,887
R^2	0.000	0.000	0.001	0.002	0.000
			Log price-dividend ratio		
			$\text{Price-dividend ratio}_{i,t+h} = a_i + b\text{FinCrisis}_{i,t} + u_{i,t+H}$		
b	-0.20***	-0.06	-0.08	-0.07	-0.01
$s.e.$	(0.05)	(0.07)	(0.05)	(0.07)	(0.09)
N	2,004	1,960	1,922	1,888	1,843
R^2	0.006	0.000	0.000	0.000	-0.001
			Log dividends		
			$\sum_{h=1}^{H} \Delta d_{i,t+h} = a_i + b\text{FinCrisis}_{i,t} + u_{i,t+H}$		
b	-0.08	-0.21***	-0.15**	-0.14*	-0.25***
$s.e.$	(0.06)	(0.04)	(0.06)	(0.07)	(0.06)
N	1,885	1,885	1,885	1,829	1,745
R^2	0.003	0.012	0.003	0.002	0.006

Table A.9: Real GDP forecasts in the wake of crises: Are they systematically overoptimistic?

This table shows how much the IMF WEO real GDP projections deviate from the realized real GDP growth in 100 × log-points. The regression $\Delta_h^{realized} y_{it} - \Delta_h^{forecast} y_{it} = \alpha_i + \beta \text{Crisis}_{it} + u_{it}$. is estimated. More negative values indicate excessive optimism. The t-statistics reported in square brackets are computed from standard errors clustered on country and year. *, **, *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

	Horizon				
	1	2	3	4	5
BVX panics	-4.030***	-3.777***	-3.815***	-4.648**	-4.905*
t-stat.	[-5.965]	[-3.830]	[-2.873]	[-2.226]	[-1.959]
N	1043	1043	1043	1043	1043
Adj. R^2	0.07	0.04	0.06	0.08	0.10
LV crises	-5.811***	-5.951***	-5.903***	-7.544***	-8.251***
t-stat.	[-5.690]	[-4.348]	[-4.151]	[-4.384]	[-4.189]
N	1043	1043	1043	1043	1043
Adj. R^2	0.11	0.06	0.07	0.10	0.12
Bank equity crashes	-3.728***	-3.299***	-3.655***	-4.508***	-4.758***
t-stat.	[-4.562]	[-4.346]	[-5.279]	[-5.056]	[-4.141]
N	1043	1043	1043	1043	1043
Adj. R^2	0.11	0.04	0.06	0.09	0.11
Interbank rate spikes	-3.321***	-2.857*	-2.057	-3.481**	-3.569*
t-stat.	[-3.275]	[-1.821]	[-1.459]	[-2.224]	[-1.814]
N	1043	1043	1043	1043	1043
Adj. R^2	0.05	0.03	0.05	0.08	0.10
Ext. liquidity support	-1.601**	-2.480***	-2.787**	-2.854**	-3.026*
t-stat.	[-1.989]	[-2.639]	[-2.432]	[-2.054]	[-1.716]
N	1043	1043	1043	1043	1043
Adj. R^2	0.00	0.02	0.05	0.07	0.10
Currency crashes	-2.151	-0.960	-0.642	-0.536	0.363
t-stat.	[-0.865]	[-0.344]	[-0.244]	[-0.179]	[0.112]
N	1043	1043	1043	1043	1043
Adj. R^2	0.00	0.01	0.04	0.07	0.09
LV currency crises	4.133***	6.639***	6.162**	8.105***	9.315***
t-stat.	[3.882]	[3.593]	[2.347]	[3.175]	[3.198]
N	1043	1043	1043	1043	1043
Adj. R^2	0.02	0.03	0.05	0.08	0.10
Balance-of-payments crises	-4.770	-4.280	-3.139	-3.785	-4.065
t-stat.	[-1.574]	[-1.123]	[-0.757]	[-0.790]	[-0.844]
N	1043	1043	1043	1043	1043
Adj. R^2	0.02	0.02	0.04	0.07	0.10

Table A.9 – cont.

	1	2	3	4	5
Nonfinancial equity crashes	-3.498***	-2.758***	-2.664***	-3.359***	-3.299**
t-stat.	[-4.533]	[-4.628]	[-3.577]	[-3.314]	[-2.397]
N	1043	1043	1043	1043	1043
Adj. R^2	0.09	0.03	0.05	0.08	0.10
Real GDP drops	0.277	1.017	0.112	-0.555	-0.646
t-stat.	[0.197]	[0.544]	[0.056]	[-0.249]	[-0.279]
N	1043	1043	1043	1043	1043
Adj. R^2	-0.01	0.01	0.04	0.07	0.09
Consumption drops	0.791	1.505	0.843	1.068	1.367
t-stat.	[1.008]	[1.345]	[0.744]	[0.976]	[1.399]
N	1043	1043	1043	1043	1043
Adj. R^2	-0.01	0.02	0.04	0.07	0.09

Appendix B. Robustness

Figure B.1: Equity returns around banking crises: 1970-2006 sample

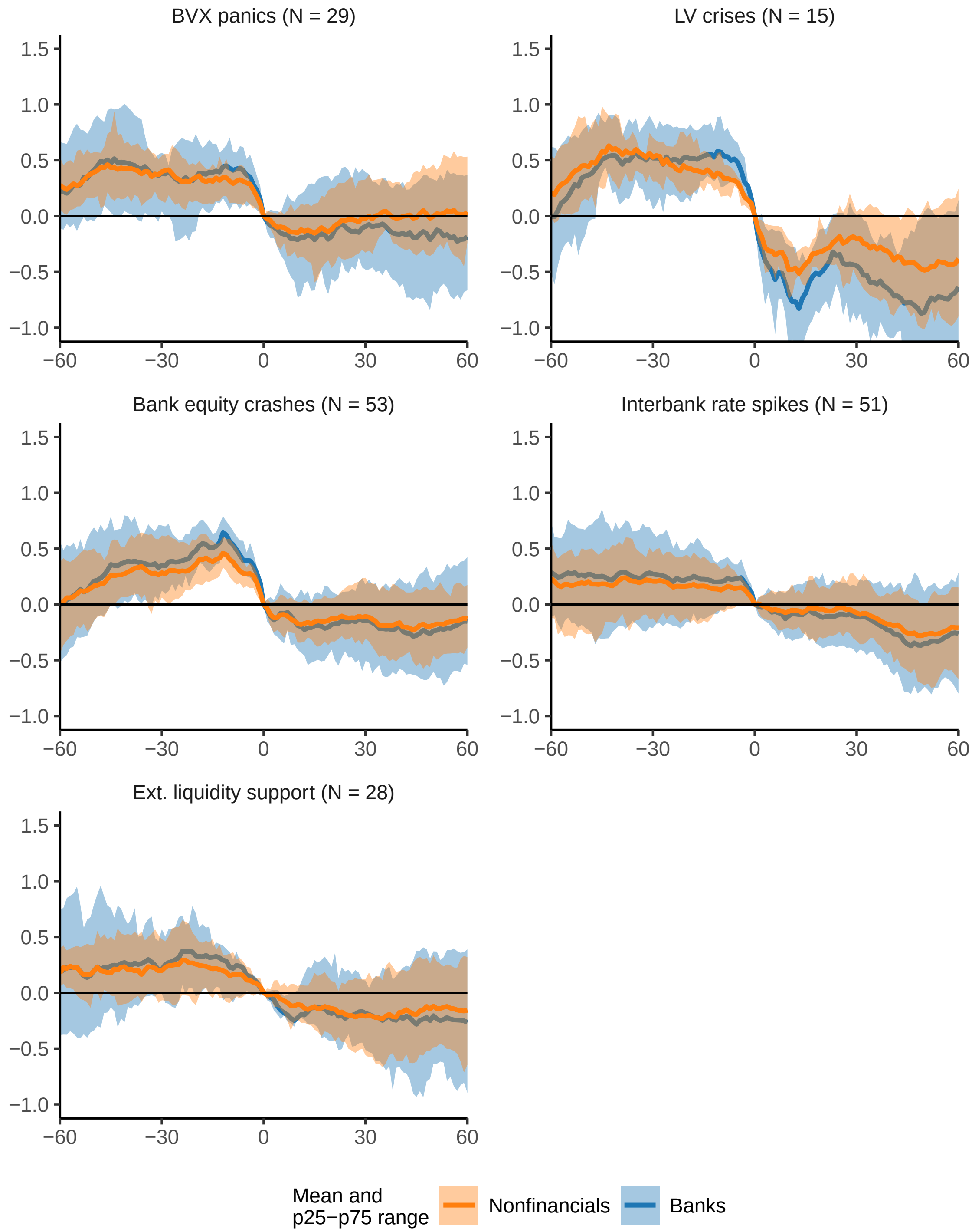


Figure B.2: Equity returns around banking crises: Advanced vs developing economies

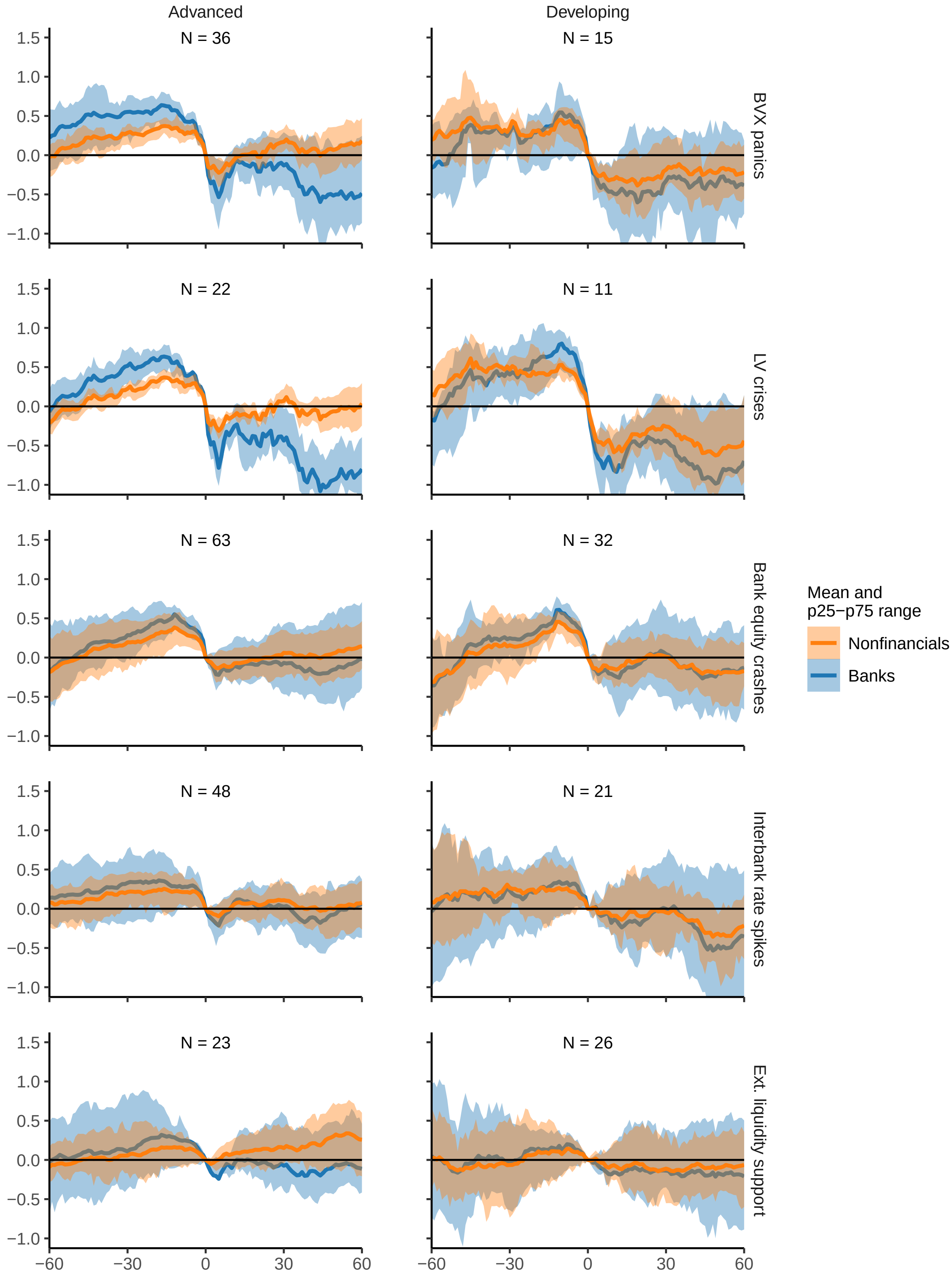


Table B.1: Long-horizon predictability around financial crises: Jorda-Schularick-Taylor (JST) data

This table is similar to Table 3 but using the JST data set. H is the future horizon in years. $FinCrisis_{i,t}$ denotes the year of a Schularick-Taylor financial crisis, and $CurrCrash_{i,t}$ denotes the year of a 30% drawdown in nominal currency returns relative to the USD.

Panel A: USD excess returns

	Full sample (1876-2015)			Prewar (1876-1945)			Postwar (1945-2015)		
H	1	3	5	1	3	5	1	3	5
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{FinCrisis}_{i,t} + u_{i,t+H}$								
b	-0.03	0.03	0.13	-0.05	0.09	0.18*	0.05	-0.01	0.16
$s.e.$	(0.06)	(0.06)	(0.09)	(0.05)	(0.08)	(0.10)	(0.12)	(0.07)	(0.15)
N	2,104	2,055	2,007	995	952	910	1,109	1,103	1,097
R^2	-0.000	-0.000	0.002	0.002	0.002	0.007	-0.000	-0.001	0.001
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{CurrCrash}_{i,t} + u_{i,t+H}$								
b	-0.03	-0.04	0.09	-0.14***	-0.14	-0.01	0.07	0.04	0.16*
$s.e.$	(0.04)	(0.06)	(0.08)	(0.04)	(0.10)	(0.10)	(0.05)	(0.06)	(0.09)
N	2,104	2,055	2,007	995	952	910	1,109	1,103	1,097
R^2	0.001	0.000	0.001	0.028	0.009	-0.001	0.004	-0.000	0.005

Panel B: LCU excess returns

	Full sample (1876-2015)			Prewar (1876-1945)			Postwar (1945-2015)		
H	1	3	5	1	3	5	1	3	5
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{FinCrisis}_{i,t} + u_{i,t+H}$								
b	-0.00	0.00	0.09	-0.03	0.00	0.07	0.07	0.04	0.17
$s.e.$	(0.05)	(0.05)	(0.07)	(0.04)	(0.05)	(0.06)	(0.09)	(0.08)	(0.12)
N	2,104	2,055	2,007	995	952	910	1,109	1,103	1,097
R^2	-0.000	-0.000	0.001	0.001	-0.001	0.001	0.001	-0.001	0.002
	$\sum_{h=1}^{H} r_{i,t+h} - r^f_{i,t+h} = a_i + b\text{CurrCrash}_{i,t} + u_{i,t+H}$								
b	0.06	0.06	0.14*	0.06	0.14	0.11	0.06	0.01	0.17**
$s.e.$	(0.04)	(0.05)	(0.07)	(0.06)	(0.10)	(0.12)	(0.04)	(0.07)	(0.09)
N	2,104	2,055	2,007	995	952	910	1,109	1,103	1,097
R^2	0.005	0.002	0.007	0.006	0.010	0.004	0.004	-0.001	0.010

Table B.2: Equity returns after banking crises: 1970-2006 sample

Crisis	Asset	Mean (annual.)	Std. dev. (annual.)	% cum. drops < -0.5	Avg. cum. drop < -0.5	Diff. in means	Diff. in std. dev.	Diff. in % cum. drops < -0.5
BVX banking panics	Nonfin.	0.058	0.31	6.9	-1.09	0.016 [1.13]	0.04	-3.0 [-0.68]
	Banks	0.010	0.50	31.0	-1.27	-0.027 [-1.12]	0.16	18.3*** [2.76]
LV banking crises	Nonfin.	-0.019	0.31	33.3	-0.87	-0.062 [-1.37]	0.04	23.4 [1.44]
	Banks	-0.090	0.49	53.3	-1.27	-0.111* [-1.80]	0.14	40.6** [2.48]
Bank equity crashes	Nonfin.	0.033	0.28	15.1	-0.96	-0.012 [-0.77]	0.00	5.2 [1.31]
	Banks	0.025	0.39	18.9	-1.20	-0.015 [-0.84]	0.05	6.1 [1.30]
Interbank rate spikes	Nonfin.	0.017	0.29	15.7	-0.90	-0.027** [-2.02]	0.02	5.8 [1.13]
	Banks	0.015	0.44	19.6	-1.37	-0.037* [-1.66]	0.10	6.8 [1.37]
Extensive liquidity support	Nonfin.	0.039	0.35	14.3	-0.90	-0.017 [-0.72]	0.07	4.4 [0.72]
	Banks	0.009	0.49	25.0	-1.30	-0.037 [-1.26]	0.14	12.2* [1.72]

Table B.3: Equity trading strategies around banking crises: 1970-2006 sample

Crisis	Asset	Holding period	Mean	Volatility	Sharpe ratio	Intl. 3-factor α	Intl. 3-factor + LRV α
	Nonfinancials	Passive benchmark	0.124	0.158	0.786	0.022	0.015
						[1.335]	[0.870]
	Banks	Passive benchmark	0.148	0.161	0.919	0.036*	0.033
						[1.725]	[1.557]
BVX banking panics	Nonfinancials	6-60 months	0.141	0.212	0.665	0.037	0.007
						[1.028]	[0.203]
		Diff. w passive	0.016	0.054***	-0.121	0.015	-0.008
			[0.459]	[2.982]	[-0.354]	[0.409]	[-0.238]
	Banks	6-60 months	0.126	0.239	0.529	0.006	-0.009
						[0.147]	[-0.202]
		Diff. w passive	-0.022	0.077***	-0.390	-0.030	-0.041
			[-0.500]	[3.833]	[-1.214]	[-0.743]	[-1.064]
LV banking crises	Nonfinancials	6-60 months	0.095	0.198	0.480	0.008	-0.016
						[0.218]	[-0.416]
		Diff. w passive	-0.029	0.039	-0.306	-0.014	-0.031
			[-0.763]	[0.446]	[-1.011]	[-0.343]	[-0.750]
	Banks	6-60 months	0.138	0.283	0.488	0.003	-0.028
						[0.046]	[-0.443]
		Diff. w passive	-0.010	0.122***	-0.431	-0.033	-0.061
			[-0.174]	[2.950]	[-1.424]	[-0.567]	[-0.962]
Bank equity crashes	Nonfinancials	6-60 months	0.154	0.213	0.725	0.023	0.026
						[0.606]	[0.626]
		Diff. w passive	0.030	0.054***	-0.061	0.001	0.011
			[0.931]	[2.840]	[-0.173]	[0.020]	[0.343]
	Banks	6-60 months	0.148	0.233	0.633	0.005	0.010
						[0.118]	[0.220]
		Diff. w passive	-0.000	0.072***	-0.286	-0.031	-0.023
			[-0.013]	[3.890]	[-0.853]	[-0.915]	[-0.647]
Interbank rate spikes	Nonfinancials	6-60 months	0.115	0.204	0.566	0.006	-0.012
						[0.194]	[-0.400]
		Diff. w passive	-0.009	0.045***	-0.219	-0.016	-0.026
			[-0.299]	[2.743]	[-0.669]	[-0.624]	[-1.031]
	Banks	6-60 months	0.131	0.228	0.572	0.014	0.005
						[0.343]	[0.133]
		Diff. w passive	-0.018	0.067***	-0.347	-0.022	-0.028
			[-0.450]	[3.654]	[-1.061]	[-0.629]	[-0.758]
Ext. liquidity support	Nonfinancials	6-60 months	0.110	0.227	0.486	-0.010	-0.021
						[-0.216]	[-0.431]
		Diff. w passive	-0.014	0.069***	-0.300	-0.032	-0.035
			[-0.353]	[4.559]	[-0.916]	[-0.734]	[-0.781]
	Banks	6-60 months	0.124	0.291	0.428	-0.023	-0.020
						[-0.345]	[-0.304]
		Diff. w passive	-0.024	0.130***	-0.491	-0.059	-0.053
			[-0.437]	[4.844]	[-1.626]	[-0.896]	[-0.798]

Table B.4: Equity returns after banking crises: Advanced economies

Crisis	Asset	Mean (annual.)	Std. dev. (annual.)	% cum. drops < -0.5	Avg. cum. drop < -0.5	Diff. in means	Diff. in std. dev.	Diff. in % cum. drops < -0.5
BVX banking panics	Nonfin.	0.088	0.21	2.8	-0.61	0.029** [2.27]	-0.02	-2.2 [-0.73]
	Banks	-0.066	0.66	36.1	-1.71	-0.106** [-2.08]	0.29	22.8*** [3.48]
LV banking crises	Nonfin.	0.062	0.18	4.5	-0.63	-0.001 [-0.06]	-0.05	-0.5 [-0.09]
	Banks	-0.133	0.44	54.5	-1.28	-0.168*** [-7.12]	0.07	41.2*** [8.65]
Bank equity crashes	Nonfin.	0.079	0.22	4.8	-0.58	0.020 [1.33]	-0.01	-0.3 [-0.08]
	Banks	0.017	0.46	20.6	-1.46	-0.012 [-0.31]	0.09	7.3 [0.90]
Interbank rate spikes	Nonfin.	0.068	0.25	8.3	-0.62	0.007 [0.41]	0.02	3.3 [0.76]
	Banks	0.035	0.34	12.5	-1.18	0.005 [0.15]	-0.03	-0.9 [-0.21]
Extensive liquidity support	Nonfin.	0.113	0.28	0.0		0.043*** [4.57]	0.05	-5.0*** [-5.43]
	Banks	0.033	0.54	17.4	-1.83	-0.031 [-0.71]	0.17	4.0 [0.44]

Table B.5: Equity returns after banking crises: Developing economies

Crisis	Asset	Mean (annual.)	Std. dev. (annual.)	% cum. drops < -0.5	Avg. cum. drop < -0.5	Diff. in means	Diff. in std. dev.	Diff. in % cum. drops < -0.5
BVX banking panics	Nonfin.	-0.016	0.39	13.3	-1.75	-0.051 [-1.46]	0.04	-4.2 [-0.49]
	Banks	-0.055	0.50	33.3	-1.41	-0.085* [-1.67]	0.06	13.7 [1.27]
LV banking crises	Nonfin.	-0.046	0.28	36.4	-0.93	-0.091 [-1.61]	-0.07	18.9 [0.90]
	Banks	-0.097	0.52	45.5	-1.52	-0.141* [-1.86]	0.08	25.8 [1.22]
Bank equity crashes	Nonfin.	-0.001	0.32	25.0	-0.99	-0.037 [-1.35]	-0.04	7.6 [1.20]
	Banks	0.018	0.45	21.9	-1.36	-0.028 [-0.96]	0.01	2.2 [0.40]
Interbank rate spikes	Nonfin.	-0.005	0.39	19.0	-1.17	-0.046* [-1.73]	0.03	1.6 [0.17]
	Banks	-0.030	0.63	38.1	-1.48	-0.073** [-2.25]	0.19	18.5*** [2.58]
Extensive liquidity support	Nonfin.	0.025	0.32	15.4	-0.90	-0.016 [-0.71]	-0.03	-2.1 [-0.37]
	Banks	0.011	0.47	26.9	-1.21	-0.044 [-1.60]	0.03	7.2 [1.17]

Table B.6: Equity trading strategies around banking crises: Advanced economies

Crisis	Asset	Holding period	Mean	Volatility	Sharpe ratio	Intl. 3-factor α	Intl. 3-factor + LRV α
N/A	Nonfinancials	Passive benchmark	0.097	0.167	0.579	0.005	0.008
						[0.448]	[0.740]
	Banks	Passive benchmark	0.098	0.208	0.470	-0.024	-0.026
						[-1.099]	[-1.203]
BVX banking panics	Nonfinancials	6-60 months	0.128	0.195	0.658	0.057*	0.051
						[1.745]	[1.558]
		Diff. w passive	0.031	0.027	0.079	0.052*	0.043
			[1.010]	[1.522]	[0.306]	[1.675]	[1.410]
	Banks	6-60 months	0.049	0.303	0.161	-0.069	-0.076
						[-1.179]	[-1.245]
		Diff. w passive	-0.049	0.094***	-0.309	-0.045	-0.050
			[-1.031]	[3.336]	[-1.283]	[-0.827]	[-0.888]
LV banking crises	Nonfinancials	6-60 months	0.020	0.157	0.125	-0.039	-0.036
						[-1.526]	[-1.404]
		Diff. w passive	-0.077**	-0.011***	-0.454*	-0.044*	-0.044
			[-2.430]	[4.300]	[-1.775]	[-1.721]	[-1.645]
	Banks	6-60 months	-0.009	0.263	-0.033	-0.118**	-0.122**
						[-2.463]	[-2.386]
		Diff. w passive	-0.107**	0.055	-0.502**	-0.094**	-0.096*
			[-2.097]	[0.264]	[-1.993]	[-2.033]	[-1.949]
Bank equity crashes	Nonfinancials	6-60 months	0.117	0.214	0.549	0.010	0.017
						[0.404]	[0.629]
		Diff. w passive	0.020	0.046***	-0.030	0.006	0.009
			[0.723]	[3.278]	[-0.114]	[0.231]	[0.375]
	Banks	6-60 months	0.060	0.277	0.218	-0.086*	-0.087*
						[-1.943]	[-1.847]
		Diff. w passive	-0.038	0.068***	-0.252	-0.061	-0.061
			[-0.809]	[3.399]	[-0.958]	[-1.407]	[-1.313]
Interbank rate spikes	Nonfinancials	6-60 months	0.116	0.178	0.651	0.057**	0.059**
						[1.997]	[2.035]
		Diff. w passive	0.019	0.011	0.072	0.052**	0.051**
			[0.698]	[0.656]	[0.272]	[1.996]	[1.995]
	Banks	6-60 months	0.132	0.232	0.570	0.045	0.047
						[1.126]	[1.191]
		Diff. w passive	0.035	0.024	0.100	0.069*	0.073*
			[0.869]	[0.154]	[0.388]	[1.720]	[1.805]
Ext. liquidity support	Nonfinancials	6-60 months	0.115	0.199	0.578	0.032	0.033
						[1.325]	[1.327]
		Diff. w passive	0.018	0.032***	-0.001	0.028	0.025
			[0.656]	[2.639]	[-0.003]	[1.276]	[1.148]
	Banks	6-60 months	0.123	0.270	0.457	-0.006	-0.001
						[-0.139]	[-0.030]
		Diff. w passive	0.025	0.062***	-0.013	0.019	0.025
			[0.664]	[2.928]	[-0.050]	[0.540]	[0.677]

Table B.7: Equity trading strategies around banking crises: Developing economies

Crisis	Asset	Holding period	Mean	Volatility	Sharpe ratio	Intl. 3-factor α	Intl. 3-factor + LRV α
N/A	Nonfinancials	Passive benchmark	0.119	0.208	0.571	0.012	0.002
						[0.418]	[0.079]
	Banks	Passive benchmark	0.128	0.228	0.561	0.024	0.014
						[0.662]	[0.392]
BVX banking panics	Nonfinancials	6-60 months	0.122	0.313	0.389	0.032	0.020
						[0.626]	[0.394]
		Diff. w passive	0.003	0.105***	-0.181	0.019	0.018
			[0.061]	[2.716]	[-0.704]	[0.416]	[0.375]
	Banks	6-60 months	0.152	0.359	0.422	0.056	0.057
						[0.899]	[0.881]
		Diff. w passive	0.024	0.132***	-0.139	0.032	0.043
			[0.411]	[2.962]	[-0.559]	[0.642]	[0.844]
LV banking crises	Nonfinancials	6-60 months	0.076	0.204	0.373	0.008	0.001
						[0.236]	[0.015]
		Diff. w passive	-0.042	-0.004***	-0.197	-0.004	-0.002
			[-1.093]	[3.715]	[-0.769]	[-0.112]	[-0.046]
	Banks	6-60 months	0.135	0.277	0.487	0.047	0.041
						[1.022]	[0.861]
		Diff. w passive	0.007	0.050**	-0.074	0.024	0.027
			[0.157]	[2.257]	[-0.303]	[0.512]	[0.574]
Bank equity crashes	Nonfinancials	6-60 months	0.084	0.192	0.436	0.020	0.014
						[0.612]	[0.424]
		Diff. w passive	-0.035	-0.016***	-0.134	0.008	0.012
			[-1.032]	[2.702]	[-0.513]	[0.256]	[0.384]
	Banks	6-60 months	0.140	0.239	0.586	0.066	0.061
						[1.544]	[1.404]
		Diff. w passive	0.012	0.012**	0.025	0.043	0.047
			[0.322]	[1.964]	[0.091]	[1.215]	[1.363]
Interbank rate spikes	Nonfinancials	6-60 months	0.071	0.237	0.298	-0.024	-0.033
						[-0.624]	[-0.845]
		Diff. w passive	-0.048	0.029	-0.273	-0.037	-0.035
			[-1.286]	[0.688]	[-1.103]	[-0.998]	[-0.978]
	Banks	6-60 months	0.093	0.298	0.314	-0.007	-0.023
						[-0.132]	[-0.462]
		Diff. w passive	-0.034	0.070**	-0.247	-0.031	-0.037
			[-0.756]	[1.963]	[-0.964]	[-0.692]	[-0.832]
Ext. liquidity support	Nonfinancials	6-60 months	0.030	0.193	0.157	-0.043	-0.048
						[-1.140]	[-1.357]
		Diff. w passive	-0.088**	-0.015***	-0.413	-0.055	-0.051
			[-2.268]	[4.153]	[-1.503]	[-1.329]	[-1.217]
	Banks	6-60 months	0.051	0.266	0.192	-0.034	-0.037
						[-0.644]	[-0.741]
		Diff. w passive	-0.077	0.039**	-0.369	-0.057	-0.051
			[-1.567]	[2.551]	[-1.487]	[-1.088]	[-0.954]

Appendix C. Data sources

Table C.1: Data sources

Panel A: Bank equity returns

Country	Total coverage	Total returns	Price returns	Dividend returns
Argentina	1993/9-2016/12	Datastream (BANKSAR)		Datastream (BANKSAR)
Australia	1960/4-1973/1		"S&P/ASX 200 Banking Index" (_AXBAJD) from GFD	Baron-Xiong
	1973/2-2016/12	Datastream (BANKSAU)		Datastream (BANKSAU)
Austria	1986/8-2016/12	Datastream (BANKSOE)		Datastream (BANKSOE)
Belgium	1973/2-2016/12	Datastream (BANKSBG)		Datastream (BANKSBG)
Brazil	1994/8-2016/12	Datastream (BANKSBR)		Datastream (BANKSBR)
Canada	1973/2-2015/12	Datastream (BANKSCN)		Datastream (BANKSCN)
Chile	1989/8-2016/12	Datastream (BANKSCL)		Datastream (BANKSCL)
Colombia	1993/1-2016/12	Datastream (BANKSCB)		Datastream (BANKSCB)
Czech	1994/4-2016/12	Datastream (BANKSCZ)		Datastream (BANKSCZ)
Denmark	1976/1-2016/12	Datastream (BANKSDK)		Datastream (BANKSDK)
Egypt	1996/10-2016/12	Datastream (BANKSEY)		Datastream (BANKSEY)
Finland	1977/12-2009/9		OMX Helsinki Banks Price Index (_HX4010D) from GFD	Baron-Verner-Xiong
	2009/10-2015/1	Datastream (BANKSFN)		Datastream (BANKSFN)
France	1960/2-1986/6		"France INSEE Credit Banks" (FRBANKCM) price index from GFD	Baron-Xiong
	1986/7-2016/12	Datastream (BANKSFR)		Datastream (BANKSFR)
Germany	1960-1973		"CDAX Banks Price" (_CXKBXD) index from GFD	Baron-Xiong
	1973-2016		"CDAX Banks Price" (_CXKBXD) index from GFD	Datastream (BASNKBD)
Greece	1990/2-2016/12	Datastream (BANKSGR)		Datastream (BANKSGR)
Hong Kong	1973/2-2016/12	Datastream (BANKSHK)		Datastream (BANKSHK)
Hungary	1994/8-1998/12	Datastream (BANKSHN)		Datastream (BANKSHN)
	1999/1-2016/12	Datastream (F3HGB3L)		Datastream (F3HGB3L)
India	1994/4-2016/12	Datastream (F3INB3L)		Datastream (F3INB3L)
Indonesia	1990/5-2016/12	Datastream (BANKSID)		Datastream (BANKSID)
Ireland	1973/2-2016/12	Datastream (BANKSIR)		Datastream (BANKSIR)
Israel	1993/2-2016/12	Datastream (BANKSIS)		Datastream (BANKSIS)
Italy	1973/2-2016/12	Datastream (BANKSIT)		Datastream (BANKSIT)
Japan	1973/2-2016/12	Datastream (BANKSJP)		Datastream (BANKSJP)

Panel A – cont.

Country	Total coverage	Total returns	Price returns	Dividend returns
Korea	1987/10-2016/12	Datastream (BANKSKO)		Datastream (BANKSKO)
Luxembourg	1992/2-2016/12	Datastream (BANKSLX)		Datastream (BANKSLX)
Malaysia	1986/2-2016/12	Datastream (BANKSMY)		Datastream (BANKSMY)
Mexico	1993/1-2016/12	Datastream (BANKSMX)		Datastream (BANKSMX)
Netherlands	1973/2-2016/12	Datastream (BANKSNL)		Datastream (BANKSNL)
Norway	1990/2-2016/12	Datastream (BANKSNW)		Datastream (BANKSNW)
Peru	1994/2-2015/9	Datastream (BANKSPE)		Datastream (BANKSPE)
Philippines	1990/1-2016/12	Datastream (BANKSPH)		Datastream (BANKSPH)
Portugal	1990/4-2014/8	Datastream (BANKSPT)		Datastream (BANKSPT)
Russia	1998/5-2016/12	Datastream (BANKSRS)		Datastream (BANKSRS)
Singapore	1973/8-2016/12	Datastream (BANKSSG)		Datastream (BANKSSG)
South Africa	1980/1-1986/10		”FTSE/JSE Africa Banks” (_JBANKD) index from GFD	Baron-Verner-Xiong
	1986/11-2016/12	Datastream (BANKSSA)		Datastream (BANKSSA)
Spain	1982/7-1987/3		“Madrid SE Banking and Finance” (_IBAN_MD) from GFD	Baron-Xiong
	1987/4-2016/12	Datastream (BANKSES)		Datastream (BANKSES)
Sweden	1960/2-1982/1		”Stockholm SX Banks Price” (_SX4010D) index from GFD	Baron-Xiong
	1982/2-2016/12	Datastream (BANKSSD)		Datastream (BANKSSD)
Switzerland	1973/5-2016/12	Datastream (BANKSSW)		Datastream (BANKSSW)
Taiwan	1988/6-2016/12	Datastream (BANKSTA)		Datastream (BANKSTA)
Thailand	1977/1-1987/1		Thailand SET Banks (_SETBD) index from GFD	Baron-Verner-Xiong
	1987/2-2016/12	Datastream (BANKSTH)		Datastream (BANKSTH)
Turkey	1990/4-2016/12	Datastream (BANKSTK)		Datastream (BANKSTK)
United Kingdom	1960/2-1965/1		”UK FT-Actuaries Banks” (_LCBKD) from GFD	Baron-Xiong
	1965/2-2016/12		”UK FT-Actuaries Banks” (_LCBKD) from GFD	Datastream (BANKSUK)
United States	1960/2-1973/1		”S&P 500 Banks Index” (_5SP4010) from GFD	Baron-Xiong
	1973/2-2016/12		”S&P 500 Banks Index” (_5SP4010) from GFD	Datastream (BANKSUS)
Venezuela	1994/6-2015/9	Datastream (BANKSVE)		Datastream (BANKSVE)

Panel B: Nonfinancial equity returns

Country	Total coverage	Total returns	Price returns	Dividend returns
Argentina	1993/9-2016/12	Datastream (TOTLIAR)		Datastream (TOTLIAR)
Australia	1960/4-1973/1		“Sydney SE Industrial and Commercial” (AUINCM) price index from GFD	Australia ASX Dividend Yield (SYAUSYM)
	1973/2-2016/12	Datastream (TOTLIAU)		Datastream (TOTLIAU)
Austria	1986/8-2016/12	Datastream (TOTLIOE)		Datastream (TOTLIOE)
Belgium	1973/2-2016/12	Datastream (TOTLIBG)		Datastream (TOTLIBG)
Brazil	1994/8-2016/12	Datastream (TOTLIBR)		Datastream (TOTLIBR)
Canada	1973/2-2015/12	Datastream (TTOCOMP)		Datastream (TTOCOMP)
Chile	1989/8-2016/12	Datastream (TOTLICL)		Datastream (TOTLICL)
Colombia	1993/1-2016/12	Datastream (TOTLICB)		Datastream (TOTLICB)
Czech	1994/4-2016/12	Datastream (TOTLICZ)		Datastream (TOTLICZ)
Denmark	1976/1-2016/12	Datastream (TOTLIDK)		Datastream (TOTLIDK)
Egypt	1996/10-2016/12	Datastream (TOTLIEY)		Datastream (TOTLIEY)
Finland	1977/12-1988/3		“Finland Unitas Industrials Index” (FIUINDUD) price index from GFD	Finland Dividend Yield (SYFINYM) from GFD
	1988/4-2015/1	Datastream (TOTLIFN)		Datastream (TOTLIFN)
France	1960/2-1973/1		Euronext Paris CAC Construction and Materials (_FRCMD) from GFD	France Dividend Yield (SYFRAYM) from GFD
	1973/2-2016/12	Datastream (TOTLIFR)		Datastream (TOTLIFR)
Germany	1960/1-1973/1		”Germany CDAX Industrials” (_CXKNXD) index from GFD	Germany Dividend Yield (SYDEUYM) from GFD
	1973/2-2016/12		”Germany CDAX Industrials” (_CXKNXD) index from GFD	Datastream (TOTLIBD)
Greece	1990/2-2016/12	Datastream (TOTLIGR)		Datastream (TOTLIGR)
Hong Kong	1973/2-2016/12	Datastream (TOTLIHK)		Datastream (TOTLIHK)
Hungary	1994/8-2016/12	Datastream (TOTLIHN)		Datastream (TOTLIHN)
India	1994/4-2016/12	Datastream (TOTLIIN)		Datastream (TOTLIIN)
Indonesia	1990/5-2016/12	Datastream (TOTLIID)		Datastream (TOTLIID)
Ireland	1973/2-2016/12	Datastream (TOTLIIR)		Datastream (TOTLIIR)
Israel	1993/2-2016/12	Datastream (TOTLIIS)		Datastream (TOTLIIS)
Italy	1973/2-2016/12	Datastream (TOTLIIT)		Datastream (TOTLIIT)
Japan	1973/2-2016/12	Datastream (TOTLIJP)		Datastream (TOTLIJP)
Korea	1987/10-2016/12	Datastream (TOTLIKO)		Datastream (TOTLIKO)

Panel B – cont.

Country	Total coverage	Total returns	Price returns	Dividend returns
Luxembourg	1992/2-2016/12	Datastream (TOTLILX)		Datastream (TOTLILX)
Malaysia	1986/2-2016/12	Datastream (TOTLIMY)		Datastream (TOTLIMY)
Mexico	1993/1-2016/12	Datastream (TOTLIMX)		Datastream (TOTLIMX)
Netherlands	1973/2-2016/12	Datastream (TOTLINL)		Datastream (TOTLINL)
Norway	1990/2-2016/12	Datastream (TOTLINW)		Datastream (TOTLINW)
Peru	1994/2-2015/9	Datastream (TOTLIPE)		Datastream (TOTLIPE)
Philippines	1990/1-2016/12	Datastream (TOTLIPH)		Datastream (TOTLIPH)
Portugal	1990/4-2014/8	Datastream (TOTLIPT)		Datastream (TOTLIPT)
Russia	1998/5-2016/12	Datastream (TOTLIRS)		Datastream (TOTLIRS)
Singapore	1973/8-2016/12	Datastream (TOTLISG)		Datastream (TOTLISG)
South Africa	1980/1-2016/12	Datastream (TOTLISA)		Datastream (TOTLISA)
Spain	1982/7-1987/3		"Madrid SE Metals" (_IMET_MD) price index from GFD	Madrid SE Dividend Yield (SYESPYM) from GFD
	1987/4-2016/12	Datastream (TOTLIES)		Datastream (TOTLIES)
Sweden	1960/2-1982/1		"Stockholm SX Industrials Price Index" (_SX20PID) price index from GFD	Stockholm SE Dividend Yield (SYSWEYM) from GFD
	1982/2-2016/12	Datastream (TOTLISD)		Datastream (TOTLISD)
Switzerland	1973/5-2016/12	Datastream (TOTLISW)		Datastream (TOTLISW)
Taiwan	1988/6-2016/12	Datastream (TOTLITA)		Datastream (TOTLITA)
Thailand	1977/1-1987/1		Thailand SET Commerce Index (_SETCD) from GFD	Thailand Dividend Yield (SYTHAYM) from GFD
	1987/2-2016/12	Datastream (TOTLITH)		Datastream (TOTLITH)
Turkey	1990/4-2016/12	Datastream (TOTLITK)		Datastream (TOTLITK)
United Kingdom	1960/2-1965/1		FTSE All-Share Industrials (_FTASX2000) index from GFD	UK FT-Actuaries Dividend Yield (_DFTASD) from GFD
	1965/2-2016/12		FTSE All-Share Industrials (_FTASX2000) index from GFD	Datastream (TOTLIUK)
United States	1960/2-1973/1		S&P 500 Industrials (_5SP20) index from GFD	S&P Industrials Dividend Yield (SPYINDW) from GFD
	1973/2-2016/12		S&P 500 Industrials (_5SP20) index from GFD	Datastream (TOTLIUS)
Venezuela	1994/6-2015/9	Datastream (TOTLIVE)		Datastream (TOTLIVE)

Panel C: Returns on other asset classes

Country	JPM EMBI sovereign bonds		Residential real estate	
	Coverage	Source	Coverage	Source
Argentina	02/1994-12/2016	Datastream (JPMGARG)		
Australia			1970-2016	JST
Austria			2001-2016	BIS
Belgium			1970-2016	JST
Brazil	08/1994-12/2016	Datastream (JPMGBRA)	2002-2015	BIS
Canada			1970-2016	JST
Chile	07/1999-12/2016	Datastream (JPMGCHI)	2003-2015	BIS
Colombia	04/1997-12/2016	Datastream (JPMGCOL)	2001-2015	BIS
Czech			2009-2015	BIS
Denmark			1976-2016	JST
Egypt	09/2001-12/2016	Datastream (JPMGEGY)		
Finland			1977-2016	JST
France			1970-2016	JST
Germany			1970-2016	JST
Greece			2007-2015	BIS
Hong Kong			1980-2016	BIS
Hungary	03/1999-12/2016	Datastream (JPMGHUN)	2008-2015	BIS
India	12/2012-12/2016	Datastream (JPMGINA)	2010-2015	BIS
Indonesia	07/2004-12/2016	Datastream (JPMGIND)	2003-2015	BIS
Ireland			1973-2016	BIS
Israel			1995-2016	BIS
Italy			1970-2016	JST
Japan			1970-2016	JST
Korea			1987-2015	BIS
Luxembourg			2008-2015	BIS
Malaysia	12/1996-12/2016	Datastream (JPMGMAL)	1989-2015	BIS
Mexico	02/1994-12/2016		2006-2016	BIS
Netherlands			1970-2016	JST
Norway			1984-2016	JST
Peru	02/1994-09/2015	Datastream (JPMGPER)	1999-2014	BIS
Philippines	02/1994-12/2016	Datastream (JPMGPHL)	2009-2015	BIS
Portugal			1988-2014	BIS
Russia	05/1998-12/2016	Datastream (JPMGRUS)	2002-2015	BIS
Singapore			1970-2016	BIS
South Africa	02/1995-12/2016	Datastream (JPMGSAF)	1999-2016	BIS
Spain			1982-2016	JST
Sweden			1970-	JST
Switzerland			1973-2016	JST
Taiwan				
Thailand			1992-2015	BIS
Turkey	08/1996-12/2016	Datastream (JPMGTUR)	2011-2015	BIS
United Kingdom			1970-2016	JST
United States			1970-2016	JST
Venezuela	06/1994-09/2015	Datastream (JPMGVEN)		

Panel D: Other variables

Indicator	Source
Short-term interest rate	3-month Treasury Bill Yield (IT***3D) from GFD, except: • Indonesia 2009-2012 – 3-month JIBOR (JIIDR3MD) from GFD • Ireland 2008-2016 – 3-month Interbank Rate (IBIRL3D) from GFD • Luxembourg – Interbank Offer Rate (IBLUXM) from GFD • Russia 1992-04/1995 – Central Bank Policy Rate (RSBCBPR) from Datastream • Russia 05/1995-2001 – Ruble 3-month Deposit Rate (RBDEP3M) from Datastream • Singapore 1973-1987 – 3-month SIBOR (IBSGP3D) from GFD • Switzerland 1973-1979 – 3-month Interbank Rate (IBCHE3D) from GFD
Inflation	Consumer Price Index Inflation Rate (CP***M) from GFD
Exchange rate (USDLCU)	Local currency per US dollar (USD***) from GFD
Real GDP	GDP (constant LCU) from World Development Indicators
Consumption expenditure	Final consumption expenditure (constant LCU) from World Development Indicators
Primary balance (% GDP)	Primary net lending/borrowing as % of GDP from IMF
Monetary rate	Central Bank Discount/Repo/Lending Rate from GFD

Table C.2: Financial crises tabulated

Country	BVX banking panics	LV banking crises	LV currency crises	Balance-of-payments crises
Argentina	3/1980, 5/1985, 4/1989, 12/1994, 3/2001	3/1980, 12/1989, 1/1995, 11/2001	3/1975, 4/1981, 5/1987, 1/2002, 12/2013	6/1970, 6/1975, 2/1981, 7/1982, 9/1986, 4/1989, 2/1990
Australia	3/1990			
Austria	9/2008	9/2008		
Belgium	9/2008	9/2008		
Brazil	9/1985, 2/1990, 7/1994	2/1990, 12/1994	4/1976, 1/1982, 6/1987, 3/1992, 1/1999, 3/2015	2/1983, 11/1986, 7/1989, 11/1990, 10/1991
Canada	7/1982			
Chile	6/1975, 9/1981	11/1981	1/1972, 9/1982	12/1971, 8/1972, 10/1973, 12/1974, 1/1976, 8/1982, 9/1984
Colombia	6/1998	7/1982, 6/1998	5/1985	3/1983, 2/1985
Czech	4/1994, 6/2000	6/1996		
Denmark	9/2008	9/2008		5/1971, 6/1973, 11/1979, 8/1993
Egypt			1/1979, 1/1990, 11/2016	
Finland	9/1991	9/1991	3/1993	6/1973, 10/1982, 11/1991, 9/1992
France	9/2008	9/2008		
Germany	9/2008	9/2008		
Greece	9/2008, 8/2011	9/2008	1/1983	
Hong Kong	9/1983, 1/1998			
Hungary	2/1997, 9/2008	9/2008		
India				
Indonesia	11/1992, 1/1998	11/1997	1/1979, 1/1998	11/1978, 4/1983, 9/1986, 8/1997
Ireland	9/2008, 11/2010	9/2008		
Israel	10/1983		1/1975, 1/1980, 1/1985	11/1974, 11/1977, 10/1983, 7/1984
Italy	9/2008	9/2008	4/1981	
Japan	11/1997	11/1997		
Korea			1/1998	
Luxembourg	9/2008	9/2008		
Malaysia	7/1985, 8/1997	7/1997	1/1998	7/1975, 8/1997

Table C.2 – cont.

Country	BVX banking panics	LV banking crises	LV currency crises	Balance-of-payments crises
Mexico	9/1982, 12/1994	12/1994	1/1977, 2/1982, 1/1995	9/1976, 2/1982, 12/1982, 12/1994
Netherlands	9/2008	9/2008		
Norway	10/1991, 9/2008	10/1991		6/1973, 2/1978, 5/1986, 12/1992
Peru			6/1976, 1/1981, 1/1988	6/1976, 10/1987
Philippines	6/1974, 1/1981	7/1997	10/1983, 1/1998	2/1970, 10/1983, 6/1984, 7/1997
Portugal	9/2008	9/2008	1/1983	
Russia	8/1995, 8/1998, 9/2008	8/1998, 9/2008	8/1998, 10/2014	
Singapore				
South Africa			7/1984, 11/2015	
Spain	9/2008	9/2008	1/1983	2/1976, 7/1977, 12/1982, 2/1986, 9/1992, 5/1993
Sweden	9/1992, 9/2008	9/1991, 9/2008	2/1993	8/1977, 9/1981, 10/1982, 11/1992
Switzerland	10/1991, 9/2008	9/2008		
Taiwan	8/1985, 7/1995			
Thailand	10/1983, 5/1996	7/1997	1/1998	11/1978, 7/1981, 11/1984, 7/1997
Turkey	11/1983, 1/1991, 4/1994, 11/2000	11/2000	3/1978, 1/1984, 2/1991, 4/1996, 3/2001	8/1970, 1/1980, 3/1994
UK	2/1974, 7/1991, 9/2008	9/2007		
US	5/1984, 9/2008	12/2007		
Venezuela	12/1978, 10/1993, 11/2009	1/1994	2/1984, 3/1989, 5/1994, 2/2002, 1/2010	2/1984, 12/1986, 3/1989, 5/1994, 12/1995
Total	69	40	53	75