
International Finance

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Session 4

Financial Crises

Roadmap

1. Explaining Financial Crises
2. Types of Financial Crises
3. Identification, Dating and Frequency of Crises
4. Real and Financial Implications of Crises
5. Predicting Financial Crises

Introduction

- The 2007-09 global financial crisis has been a painful reminder of the multifaceted nature of crises
- Crises are, at a certain level, extreme manifestations of the interactions between the financial sector and the real economy

Introduction

- Multifaceted:
 - Domestic or external origins
 - Stem from private or public sectors.
 - Different shapes and sizes,
 - Evolve over time into different forms,
 - Can rapidly spread across borders.
- Require immediate and comprehensive policy responses,
 - call for major changes in financial sector
 - fiscal policies,
 - can necessitate global coordination of policies.

Introduction

- What are the main factors explaining financial crises?
- What are the major types of financial crises?
- What are the real sector and financial sector implications of crises?
- Is it possible to prevent and/or forecasts financial crises?

Introduction

- Financial crises have common elements, but they come in many forms.
- A financial crisis is often associated with one or more of the following phenomena:
 - substantial changes in credit volume and asset prices;
 - Severe disruptions in financial intermediation and the supply of external financing
 - large-scale balance sheet problems (of firms, households, financial intermediaries, and sovereigns);
 - large-scale government support (in the form of liquidity support and recapitalization).

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5. Predicting Financial Crises

Explaining Financial Crises

- A. Asset Prices Booms and Busts
- B. Credit Booms and Busts
- C. Impact of Asset Price and Credit Busts

A. Asset Price Booms and Busts

- Empirical studies have documented:
 - the various phases of financial crises, from initial, small-scale financial disruptions to large-scale national, regional, or even global crises.
 - how, in the aftermath of financial crises, asset prices and credit growth can remain depressed for a long time and how crises can have long-lasting consequences for the real economy.

A. Asset Price Booms and Busts

- Patterns of exuberant increases in asset prices, often followed by crashes, figure prominently in many accounts of financial instability, for both advanced countries and emerging market economies,
- A bubble, an extreme form of such deviation, can be defined as “the part of asset price movement that is unexplainable based on what we call fundamentals” (Garber, 2000).

A. Asset Price Booms and Busts

- Formal models attempting to explain asset-price bubbles have been available for some time.
- Three kinds of models:
 - Rational behavior can lead to collective mispricing, which in turn can result in bubbles.
 - Microeconomic distortions that can lead to mispricing.
 - “Irrationality” of investors

A. Asset Price Booms and Busts

- Some models employing rational investors can explain bubbles without distortions
- Blanchard and Watson (1982), under rational expectations, the asset price does not need to equal its fundamental value, leading to “rational” bubbles
- Branch and Evans (2008), employing a theory of learning where investors use most recent (instead of past) data, find that shocks to fundamentals may increase return expectations.
 - This may cause stock prices to rise above levels consistent with fundamentals.
 - As prices increase, investors’ perceived riskiness declines until the bubble bursts.

A. Asset Price Booms and Busts

- Bubbles may relate to agency issues (Allen and Gale, 2007).
- For example, due to risk shifting – as when agents borrow to invest (e.g., margin lending for stocks, mortgages for housing), but can default if rates of return are not sufficiently high – prices can escalate rapidly.
- Fund managers who are rewarded on the upside more than on the downside (somewhat analogous to limited liability of financial institutions), bias their portfolios towards risky assets.

A. Asset Price Booms and Busts

- Investors' behavior can also drive asset prices away from fundamentals, at least temporarily.
- Frictions in financial markets (notably those associated with information asymmetries) and institutional factors can affect asset prices:
 - differences of information and opinions among investors (related to disagreements about valuation of assets),
 - short sales constraints,
 - Synchronization risk (herding)
 - and other limits to arbitrage are possible reasons for asset prices to deviate from fundamentals.

A. Asset Price Booms and Busts

- !
- Of course, “evidence of irrationally” may reflect a mis-specified model, i.e., irrational behavior is not easily falsifiable.

B. Credit Booms and Busts

- A rapid increase in credit is another common thread
- Credit booms can be triggered by a wide range of factors, including shocks and structural changes in markets:
 - productivity,
 - economic policies
 - capital flows.
- Credit Booms associated to economic booms
 - Dell’Ariccia and others (2013) find that lagged GDP growth is positively associated with the probability of a credit boom:
 - in the three-year period preceding a boom, the average real GDP growth rate reaches 5.1 percent, compared to 3.4 percent during a tranquil three year period.

B. Credit Booms and Busts

- Sharp increases in international financial flows can amplify credit booms.
- Accommodative monetary policies, especially when in place for extended periods, have been linked to credit booms and excessive risk taking
- Analytical models, including on the relationship between agency problems and interest rates (e.g., Stiglitz and Weiss, 1981), suggest:
 - more risk-taking when interest rates decline and
 - a flight to quality when interest rates rise, with consequent effects on the availability of external financing.

B. Credit Booms and Busts

- Structural factors include financial liberalization (when poorly designed or sequenced) and innovation.
- Financial liberalization has been found to often precede crises in empirical studies (Kaminsky and Reinhart, 1999; Detragiache and Demirguc-Kunt, 2006).
- Dell’Ariccia and others (2013) report that roughly a third of booms they identify follow or coincide with financial liberalization episodes.

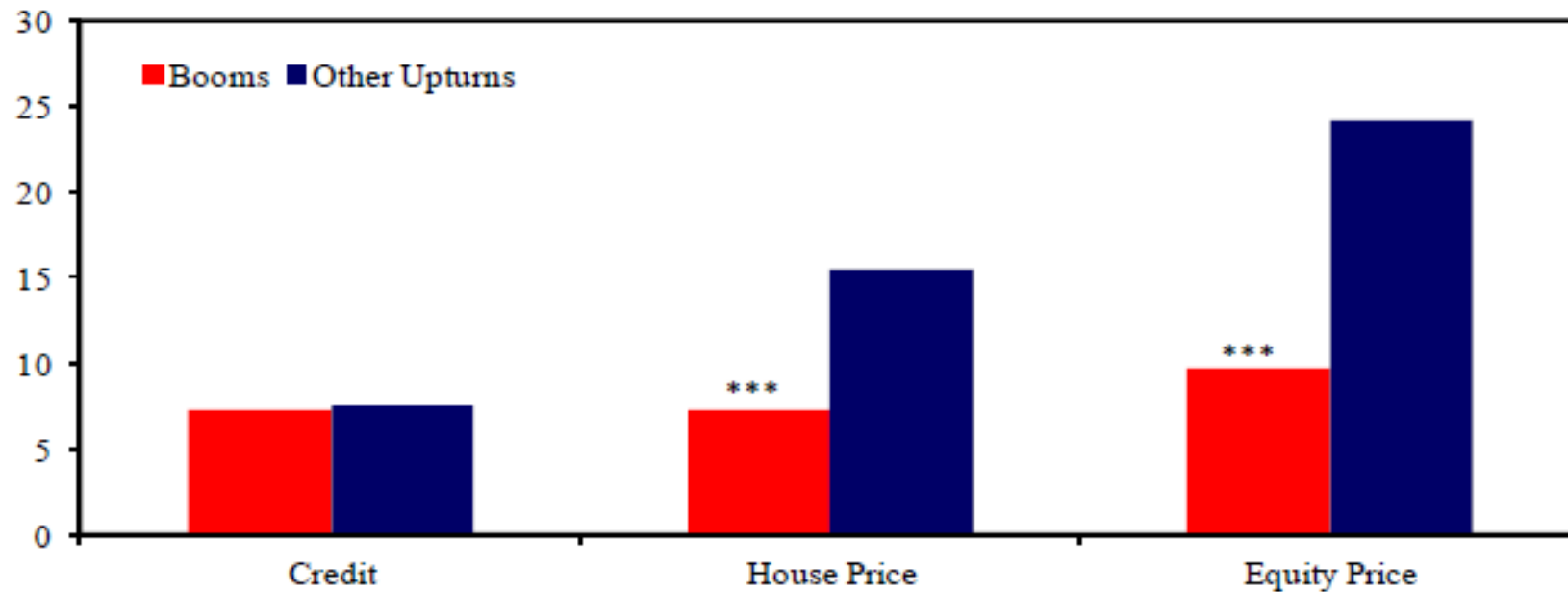
C. Impact of Asset Price and Credit Busts

- Sharp movements in asset and credit markets during financial crises are quite different from those normally observed.
 - Booms in credit and asset markets are shorter, stronger, and faster than other upturns.
 - And crunches and busts are longer, deeper and more violent than other downturns.

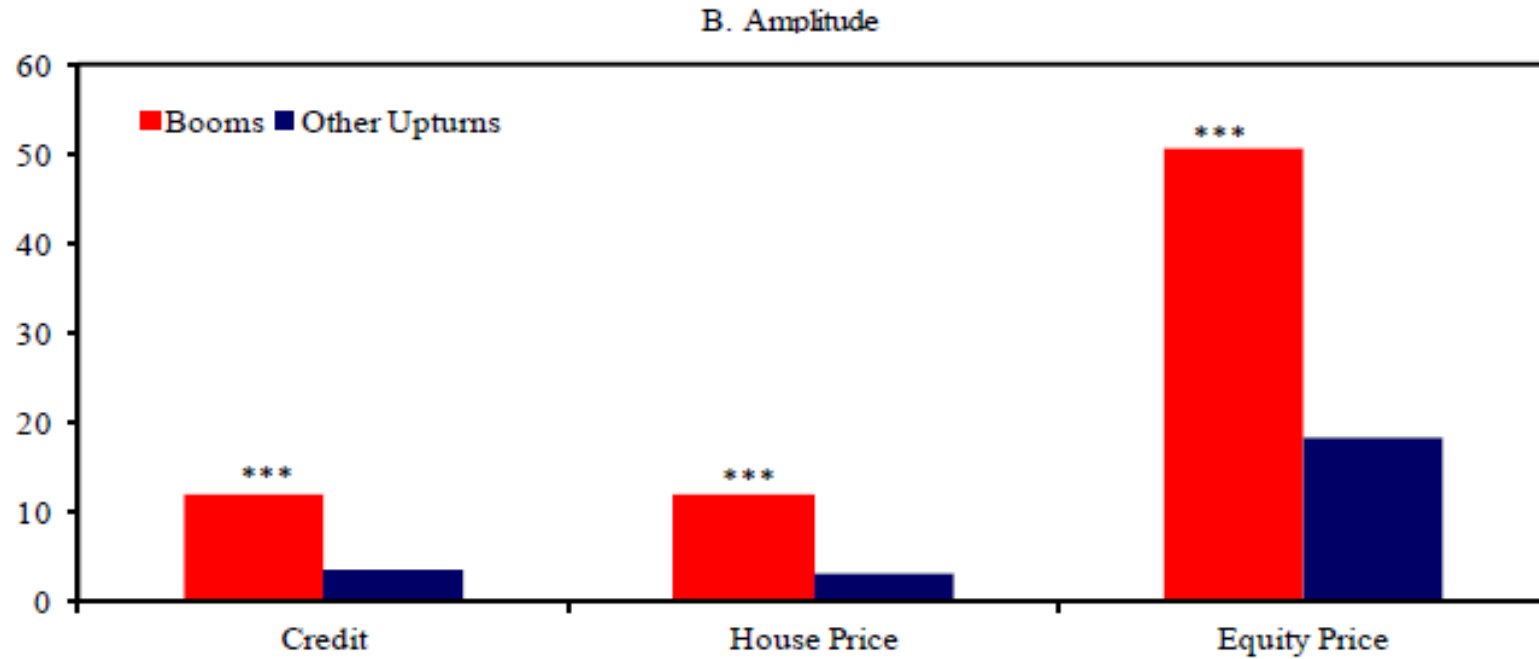
C. Impact of Asset Price and Credit Busts

Figure 2.A. Credit and Asset Price Booms

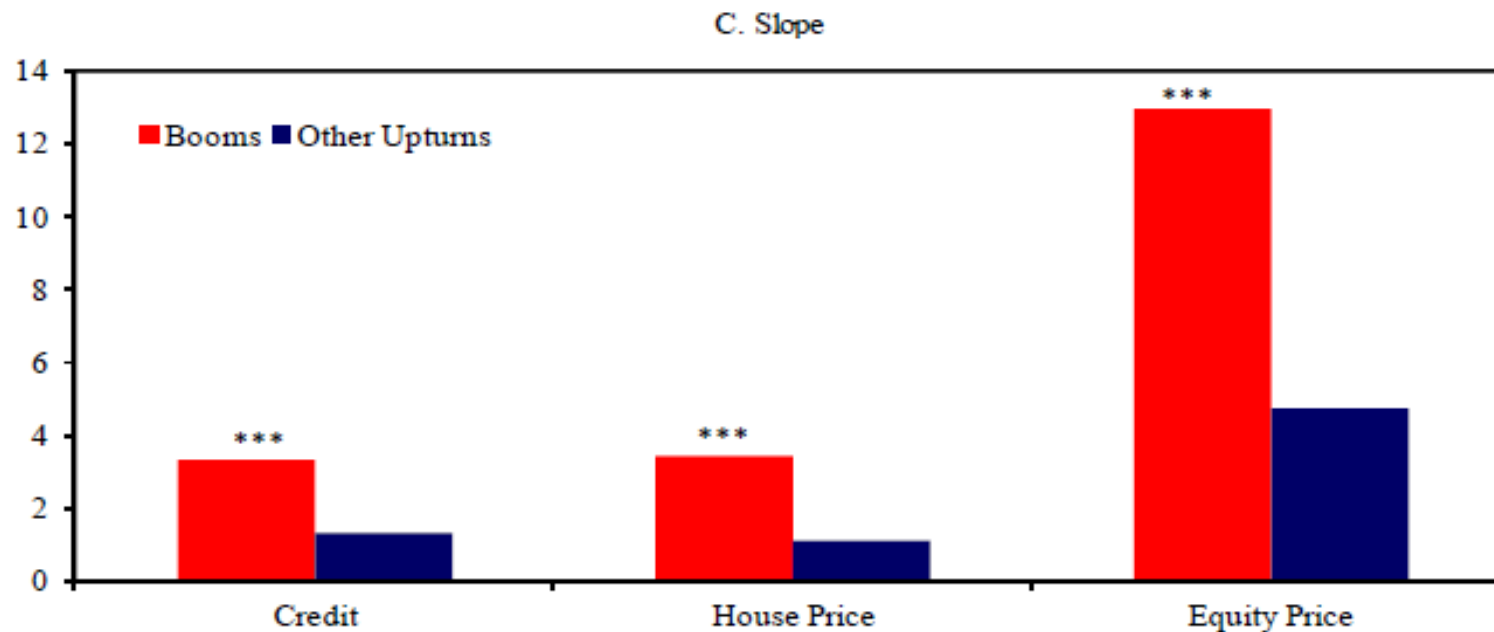
A. Duration



C. Impact of Asset Price and Credit Busts



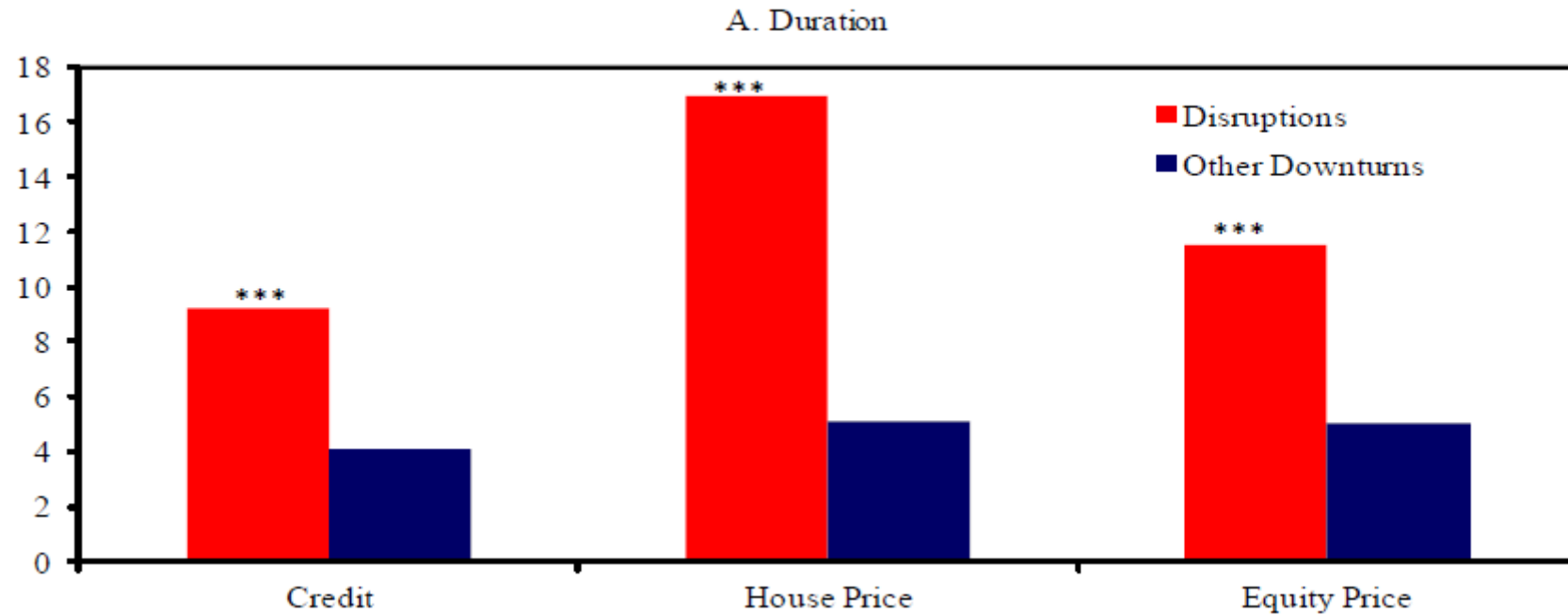
C. Impact of Asset Price and Credit Busts



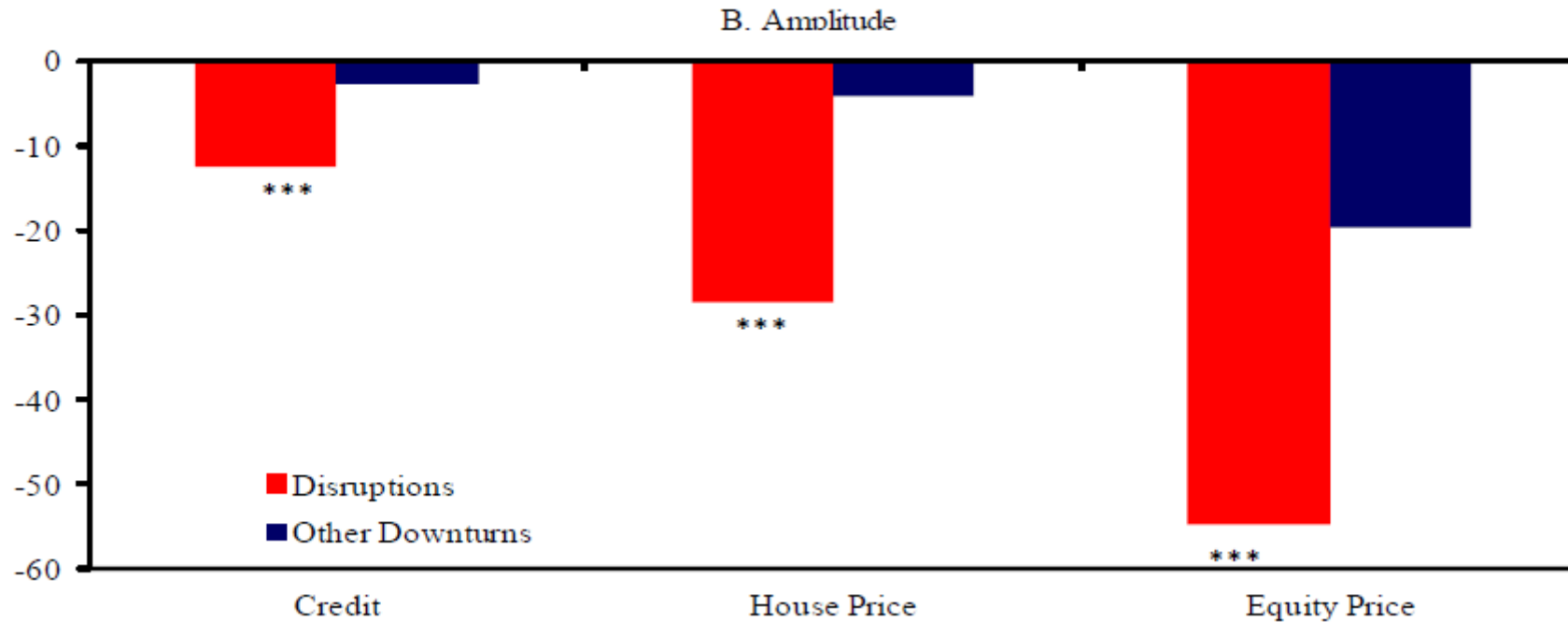
Notes: Amplitude and slope correspond to sample median and duration corresponds to sample mean. Duration is the time it takes to attain the level at the previous peak after the trough. Amplitude is calculated based on the one year change in each respective variable after the trough. Slope is the amplitude from peak to trough divided by the duration. Booms are the top 25 percent of upturns calculated by the amplitude. *** indicate that the difference between corresponding financial boom and other upturns is statistically significant at 1 percent level. The sample includes data for 23 advanced countries and covers 1960-2011.

C. Impact of Asset Price and Credit Busts

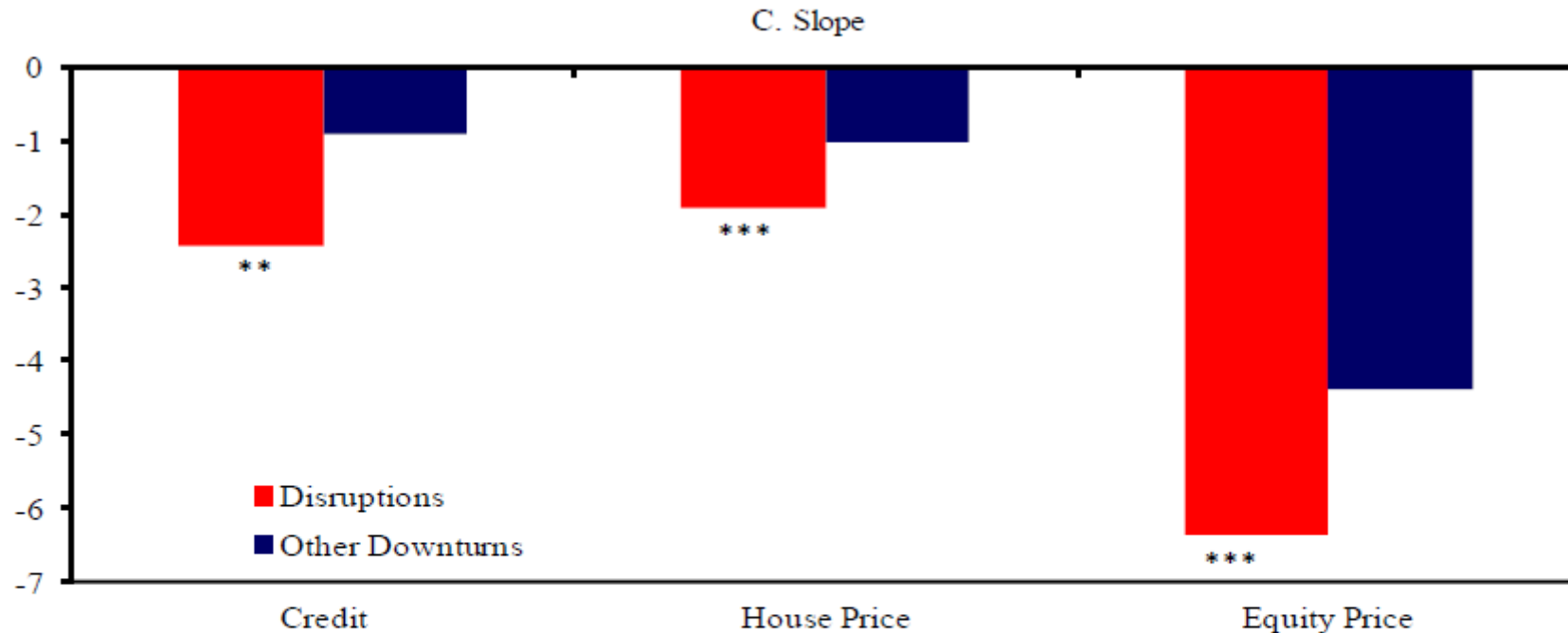
Figure 2.B. Credit Crunches and Asset Price Busts



C. Impact of Asset Price and Credit Busts



C. Impact of Asset Price and Credit Busts



Notes : Amplitude and slope correspond to sample median and duration corresponds to sample mean. Duration is the number of quarters between peak and trough. Amplitude is calculated based on the decline in each respective variable during the downturn. Slope is the amplitude from peak to trough divided by the duration. Crunches and busts are the worst 25 percent of downturns calculated by the amplitude. ***, ** indicate that the difference between the corresponding disruptions and other downturns is statistically significant at 1 and 5 percent level, respectively. The sample includes data for 23 advanced countries and covers 1960-2011.

C. Impact of Asset Price and Credit Busts

- Adverse real effects of asset price busts and credit crunches on the real economy through bank lending and other financial institutions
- Two channels by credit demand/supply leading to credit crunch:
 - With borrowing/lending collateralized, when the market price of collateral falls, new credit become impaired, adversely affect investment.
 - Fire sales of financial institutions during a crash: to hoard cash

Roadmap

1. Explaining Financial Crises
2. **Types of Financial Crises**
3. Identification, Dating and Frequency of Crises
4. Real and Financial Implications of Crises
5. Predicting Financial Crises

Types of Financial Crises

- A. Currency Crises
- B. Sudden Stops
- C. Foreign and Domestic Debt Crises
- D. Banking Crises

Types of Financial Crises

- A *currency* crisis involves a speculative attack on the currency resulting:
 - in a devaluation (or sharp depreciation), or
 - forcing the authorities to defend the currency by
 - expending large amount of international reserves,
 - or sharply raising interest rates,
 - or imposing capital controls.

Types of Financial Crises

- A *sudden stop* (or a capital account or balance of payments crisis) can be defined :
 - as a large (and often unexpected) fall in international capital inflows or
 - a sharp reversal in aggregate capital flows to a country,
 - likely taking place in conjunction with a sharp rise in its credit spreads.

Types of Financial Crises

- *A foreign debt crisis* takes place
 - when a country cannot (or does not want to) service its foreign debt.
 - It can take the form of a sovereign or private (or both) debt crisis.

- *A domestic public debt crisis* takes place
 - when a country does not honor its domestic fiscal obligations in real terms, either
 - by defaulting explicitly, or
 - by inflating or otherwise debasing its currency, or
 - by employing some (other) forms of financial repression.

Types of Financial Crises

- In a *systemic banking* crisis, actual or potential bank runs and failures can induce
 - banks to suspend the convertibility of their liabilities or
 - compel the government to intervene to prevent this by extending liquidity and capital assistance on a large scale.

Types of Financial Crises

- Other classifications are possible, but regardless the types of crises likely overlap.
 - A number of banking crises, for example, are associated with sudden stop episodes and currency crises.
- Some types of crises are more subject to:
 - Quantitative methodologies: Currency crises and sudden stops
 - Qualitative methodologies: Foreign debt crisis and banking crises

A. Currency crises

- Three generations of models (to explain crises for 4 decades)
 - The first generation
 - currency devaluations in Latin America
 - Krugman (1979) and Flood and Garber (1984)
 - rational behavior by investors who correctly foresee that a government has been running excessive deficits financed with central bank credit
 - The second generation
 - the European Exchange Rate Mechanism crisis in 1992
 - Obstfeld (1994, 1996)
 - multiple equilibria: self-fulfilling prophecies, in which the reason investors attack the currency is simply that they expect other investors to attack the currency

A. Currency crises

- The third generation
 - Asian crises of the late 1990s
 - McKinnon and Pill (1996), Krugman (1998),
 - rapid deteriorations of balance sheets (currency e.g. mismatches) associated with fluctuations in asset prices, including exchange rates while macroeconomic imbalances are small
 - vulnerabilities associated with financial and corporate sectors

A. Currency crises

- Empirical research has not been able to differentiate which generation of these models provides the best characterization of currency crises.
- Empirical literature has found that
 - certain indicators tend to be associated with crises,
 - the outcomes have been disappointing, with the timing of crises very hard to predict (see below)

B. Sudden Stops

- These models resemble the latest generation of currency crises models
- Balance sheet mismatches – notably currency, but also maturity – in financial and corporate sectors (Calvo et al., 2006).
- Greater weight to the role of international factors (eg changes in international interest rates or spreads on risky assets)
- can account for the current account reversals and the real exchange rate depreciation typically observed during crises in emerging markets.
- The models explain less well the typical sharp drops in output and total factor productivity (TFP).

B. Sudden Stops

- Sudden stops often take place in countries (Calvo, Izquierdo and Mejía, 2008)
 - with relatively small tradable sectors and
 - Large foreign exchange liabilities.
- Sudden stops have affected countries with
 - widely disparate per capita GDPs, levels of financial development, and exchange rate regimes, as well as
 - countries with different levels of reserve coverage

B. Sudden Stops

- Example of episodes:
 - Latin America and Asia in the 1990s
 - Central and Eastern Europe in the 2000s.

C. Foreign and Domestic Debt Crises

- inability or unwillingness to pay, i.e., default, can result from different factors
 - a country defaults when the opportunity cost of not being able to borrow ever again is low,
 - countries default in bad times to smooth consumption
- Such models are unable, however, to fully account
 - why sovereigns default and
 - why creditors lend as much as they do.
- For example:
 - Tomz and Wright (2007) report that in only 62 percent of defaults cases output was below trend.
 - Models also underestimate the willingness of investors to lend to countries in spite of large default risk.

C. Foreign and Domestic Debt Crises

- Domestic debt crises have been prevalent throughout history, these episodes had received only limited attention in the literature until recently
- Often take the form of inflation (reduced the real value of government debt and thus provided fiscal relief):
 - U.S. experienced a rate of inflation close to 200 percent in the late 1770s
 - hyperinflation in some European countries following the World War II
 - Or “debase” their currency by reducing the metal content of coins or switching to another metal.

C. Foreign and Domestic Debt Crises

- The cost of default on external debt:
 - increases its debt intolerance and, in turn, makes it very difficult to graduate to the club of countries that have continuous access to global capital markets
- One important dimension; “the original sin”:
 - countries with unfavorable conditions have no choice but to rely mostly on short-term, foreign currency denominated debt as their main source of capital

D. Banking Crises

- Problems of individual banks can quickly spread to the whole banking system.
- Financial institutions are inherently fragile entities giving their roles in maturity transformation and liquidity creation
 - highly leveraged balance sheets
- A simple example: the bank run (Marry Poppins)
 - Banks borrow short and lend long (maturity transformation)
 - Banks vulnerable to sudden demands for liquidity.
 - run occurs when a large number of customers withdraw their deposits because they believe the bank is, or might become, insolvent.

D. Banking Crises

- A selffulfilling prophecy (or perverse feedback loop):
 - as more people withdraw their deposits,
 - The likelihood of default increases, and
 - this encourages further withdrawals.
 - ...
- This can destabilize the bank to the point where it faces bankruptcy as it cannot liquidate assets fast enough to cover its short-term liabilities.
- The need of microprudential regulations
- Policy interventions, such as public guarantees, capital support and purchases of non-performing assets or last resort facilities, can mitigate systemic risk when financial turmoil hits.

D. Banking Crises

- History of bank runs
 - US: banking panics of the 1800s and in the early 1900s (during the Great Depression)
 - Most runs stop in the US with the introduction of deposit insurance in 1933
 - Indonesia during the 1997 Asian financial crisis
 - Northern Rock, a bank specializing in housing finance in the U.K
 - Cyprus in 2013, Greece in Summer 2015.

D. Banking Crises

- Modern versions of banking crises:
 - Problems in assets markets
 - On the liability side of banks
 - no large-scale deposit runs on banks,
 - but large-scale problems arising from (real estate) loans made many banks undercapitalized and required support of governments
 - Banking panics more likely occur near the peak of the business cycle, with recessions on the horizon, because of concerns that loans do not get repaid (Gorton 1988; Gorton and Wilton, 2000).
- Recent examples:
 - Nordic banking crises in the late 1980s, the crisis in Japan in the late 1990s, and the recent crises in Europe

D. Banking Crises

- While observers differ on the exact weights given to various factors, the list of factors common to previous crises is generally similar.
- Four features often mentioned in common are:
 - (1) asset price increases that turned out to be unsustainable;
 - (2) credit booms that led to excessive debt burdens;
 - (3) build-up of marginal loans and systemic risk; and
 - (4) the failure of regulation and supervision to keep up with financial innovation and get ahead of the crisis when it erupted.

D. Banking Crises

- The global financial crisis (2007-2008) was, however, also rooted in some new factors.
- Four key new aspects often mentioned are:
 - (1) the widespread use of complex and opaque financial instruments;
 - (2) the increased interconnectedness among financial markets, nationally and internationally, with the U.S. at the core;
 - (3) the high degree of leverage of financial institutions; and
 - (4) the central role of the household sector.

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Identification, Dating and Frequency of Crises

- A. Identification and dating
- B. Frequency and Distribution

Identification, Dating and Frequency of Crises

- While currency (and inflation) crises and sudden stops lend themselves to quantitative approaches,
- The dating of debt and banking crises is typically based on qualitative and judgmental analyses.
- Variations in methodologies can lead to differences in the start and end dates of crises.
- Various types of crises can overlap in a single episode, creating possible ambiguities as to how to classify the episode.

Identification, Dating and Frequency of Crises

- Crises have evolved over time
 - currency crises were dominant during the 1980s
 - banking crises and sudden stops became more prevalent in the 1990s and 2000s.

A. Identification and Dating

- **Currency crises:** Thresholds per year
 - Reingart and Rogoff (2009): XR depreciation of 15%, Inflation of 20%
 - Frankel and Rose (1996): XR cumulative depreciation of 25% and at least 10% points greater than in the preceding 12 months
- A measurement issue when no significant adjustment in currency, due to
 - international reserves or
 - adjustment in interest rates to absorb exchange rate pressures
- A composite index of speculative pressure based on actual exchange rate changes, and movements in international reserves and interest rates (Eichengreen, Rose and Wyplosz, 1996)

A. Identification and Dating

- **Sudden stops and balance-of-payments crises**
 - one or more year-on year fall in capital flows that are at least two standard deviations below its sample mean (Calvo, Izquierdo and Mejía, 2008)
 - starts (ends) when the annual change in capital flows falls (exceeds) one standard deviation below (above) its mean (Mauro and Becker, 2006).
 - large spikes in the Emerging Markets Bond Index (EMBI) spread, indicating a shift in the supply of foreign capital (Izquierdo, 2012)
 - ratio of net private capital inflows to GDP in the year after the episode terminates is more than 5 percentage point lower than at the end of the episode (Cardarelli, Kose and Elekdag (2010)

A. Identification and Dating

- **External sovereign debt crises**
 - Simple definition: the default on payments.
 - Classification of rating agencies or on information from international financial institutions (eg IMF)
 - Various defaults:
 - one class of claims or various
 - bank claims or bond claims, private or public claims
 - the length of default (missing a single or several payments).
 - Others look instead at the increases in spreads in sovereign bonds as an indicator of (the probability of) default (Edwards, 1984).
 - The end of a default is harder to date:
 - when countries regained access in some form to private financial markets.
 - when countries regain a certain credit rating

A. Identification and Dating

- **Domestic debt crises** are more difficult to identify since countries can default in many ways:
 - outright direct defaults;
 - periods of hyper- or high inflation;
 - punitive taxation of interest payments;
 - forced interest rate or principal adjustments or conversions;
 - debasing of currency; and
 - forms of financial repression.

A. Identification and Dating

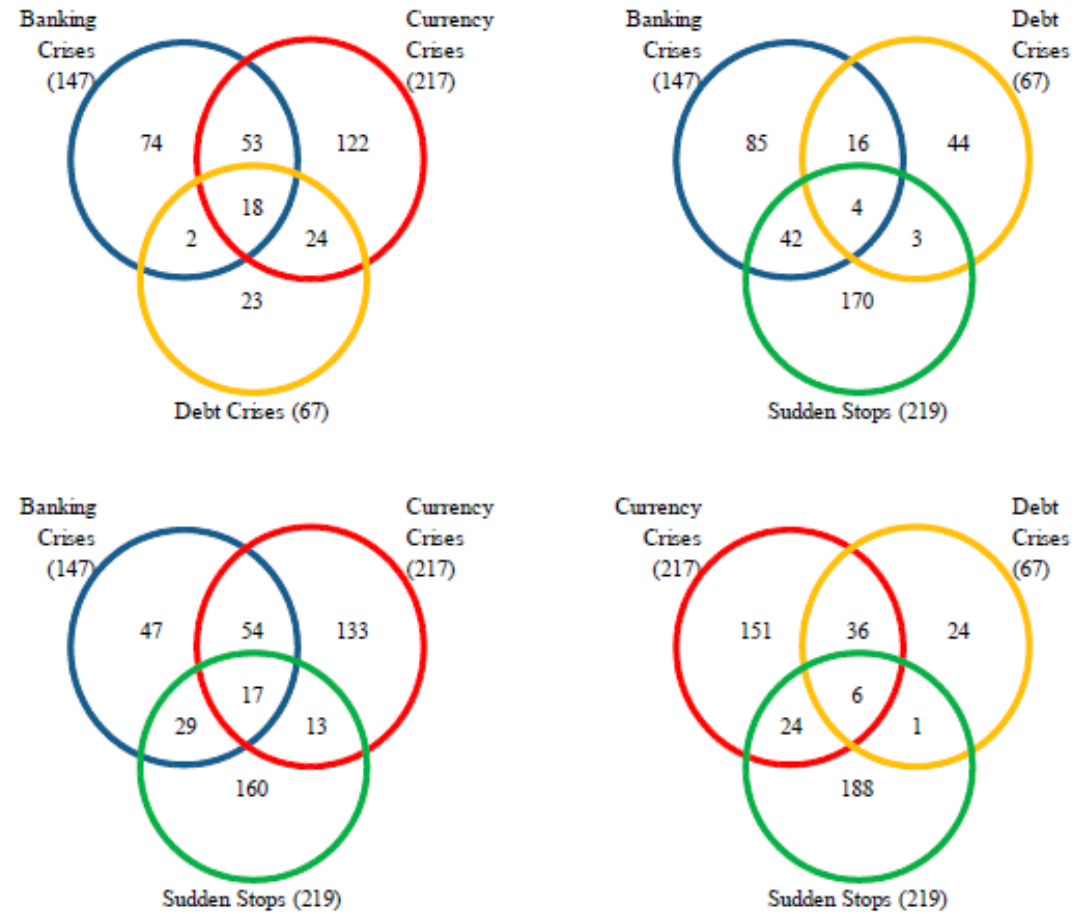
- **Banking crises** dating can be particularly challenging
 - a combination of events – such as forced closures, mergers, or government takeover of many financial institutions, runs on several banks, or the extension of government assistance to one or more financial institutions
 - assessments of financial conditions
 - fiscal costs associated with resolving these episodes

A. Identification and Dating

- Disclaimer:
 - Different types of crises can overlap and do not necessarily take place as independent events.
 - One type of crisis can lead to another type of crisis.
 - Or two crises can take place simultaneously due to common factors.
 - Crises in emerging markets, for example, often have been combinations of currency and banking crises, associated with sudden stops in capital flows, and often subsequently turning into sovereign debt crises.
 - Cautious when interpreting frequency and distribution

A. Identification and Dating

Figure 4. Coincidence of Financial Crises



B. Frequency and Distribution

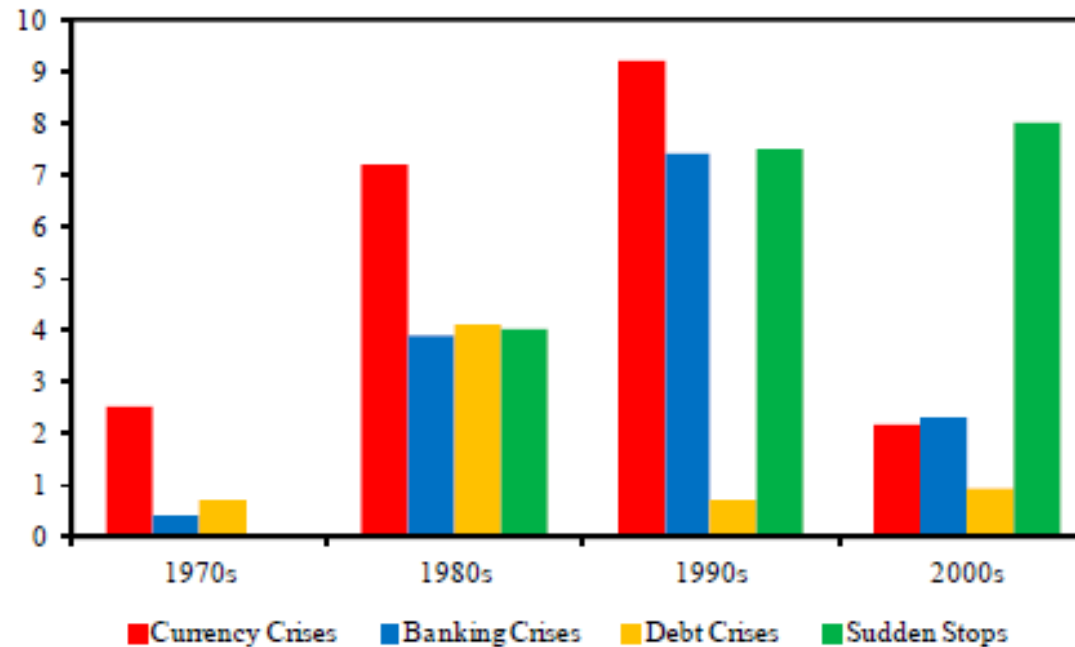
- Crises have afflicted both emerging markets and advanced countries throughout centuries
- In the three decades before 2007, most crises occurred in emerging markets.
 - Latin American crises in the late 1970s-early 1980s,
 - the Mexican crisis in 1995,
 - the East Asian crises in the mid- to late 1990s
- Many countries which are developed today experienced financial crises when they were going through their own process of emergence,
 - including Australia, Spain, the U.K. and the U.S. in the 1800s.
 - France defaulted on its external debt eight times over the period 1550-1800

B. Frequency and Distribution

- The three decades after the World War II were relatively crises-free,
- The most recent three decades have seen many episodes
- Some relate this increase to more liberalized financial markets, including floating exchange rates, and greater financial integration
- banking crises still last the longest
- Cluster of financial crises (in waves in specific regions)

B. Frequency and Distribution

Figure 5. Average Number of Financial Crises over Decades



Notes: This graph shows the average number of financial crises in respective decades.

Sources: The dates of banking, currency, and debt crises are from Laeven and Valencia (2008, 2011) and the dates of sudden stops are from Forbes and Warnock (2011).

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Real and Financial Implications of Crises

- A. Real Effects of Crises
- B. Financial Effects of Crises

A. Real Effects of Crises

- In short:
 - Deep recessions (size and duration)
 - Slow recoveries
 - Impact not only on output and employment but also on Total factor productivity
 - Fiscal problems (recessions + restructuring in banking crises)
 - Banking crises and Debts crises often associated

A. Real Effects of Crises

- Financial crises have large economic costs
- Many recessions associated with financial crises
- Financial crises often tend to make these recessions worse than a “normal” business cycle recession
 - The average duration of a recession associated with a financial crisis is some six quarters, two more than a normal recession.
 - A larger output decline in recessions associated with crises than in other recessions.
 - The cumulative loss of a recession associated with a crisis (computed using the lost output relative to the pre-crisis peak) is also much larger than that of a recession without a crisis.

A. Real Effects of Crises

- Ex-post cost of financial crises (Barrell et al., 2006)
- Ad-hoc hypotheses
 - Window (dating)
 - Behaviour of output with/without controlled variables
 - Relative to pre-trend or not
- Claessens, Kose and Terrones (2012)
 - the traditional business cycles methodology to identify recessions
 - The differences between trend growth and actual growth for a number of years following the crisis or until the time when annual output growth returned to its trend.

A. Real Effects of Crises

- Crises are generally associated with significant declines in a wide range of macroeconomic aggregates
 - consumption, investment, industrial production,
 - employment,
 - exports and imports.
 - Total factor productivity
- For example,
 - the decline in consumption during recessions associated with financial crises is typically seven to ten times larger than those without such crises in emerging markets.
 - In recessions without crises, the growth rate of consumption slows down but does not fall below zero. In contrast, consumption tends to contract during recessions associated with financial crises

A. Real Effects of Crises

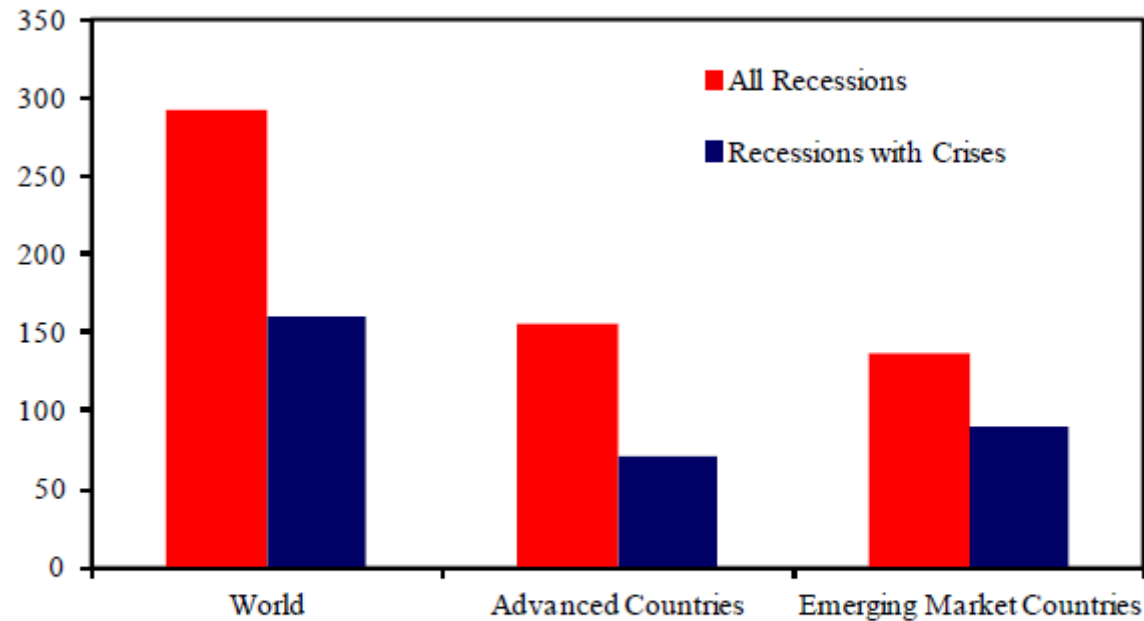
- Recoveries following crises tend to be weak and slow, with long-lasting effects (eg Kannan, Scott, and Terrones, 2013).
- From a fiscal perspective, especially banking crises can be very costly.
 - Gross fiscal outlays (recessions lead to lower tax receipts)
 - net fiscal costs of resolving financial distress and restructuring the financial sector.
- Furceri and Zdzienicka (2012) report that debt crises are more costly than banking and currency crises and are typically associated with
 - output declines of 3-5 percent after one year and
 - 6-12 percent after 8 years

A. Real Effects of Crises

- The combination of financial system restructuring costs and a slow economy can lead public debt to rise sharply during financial crises.
- Reinhart and Rogoff (2009) document that crises episodes are often associated with substantial declines in tax revenues and significant increases in government spending.
- Banking crises often lead to sovereign debt crises

A. Real Effects of Crises

Figure 6. Coincidence of Recessions and Crises
(number of events)

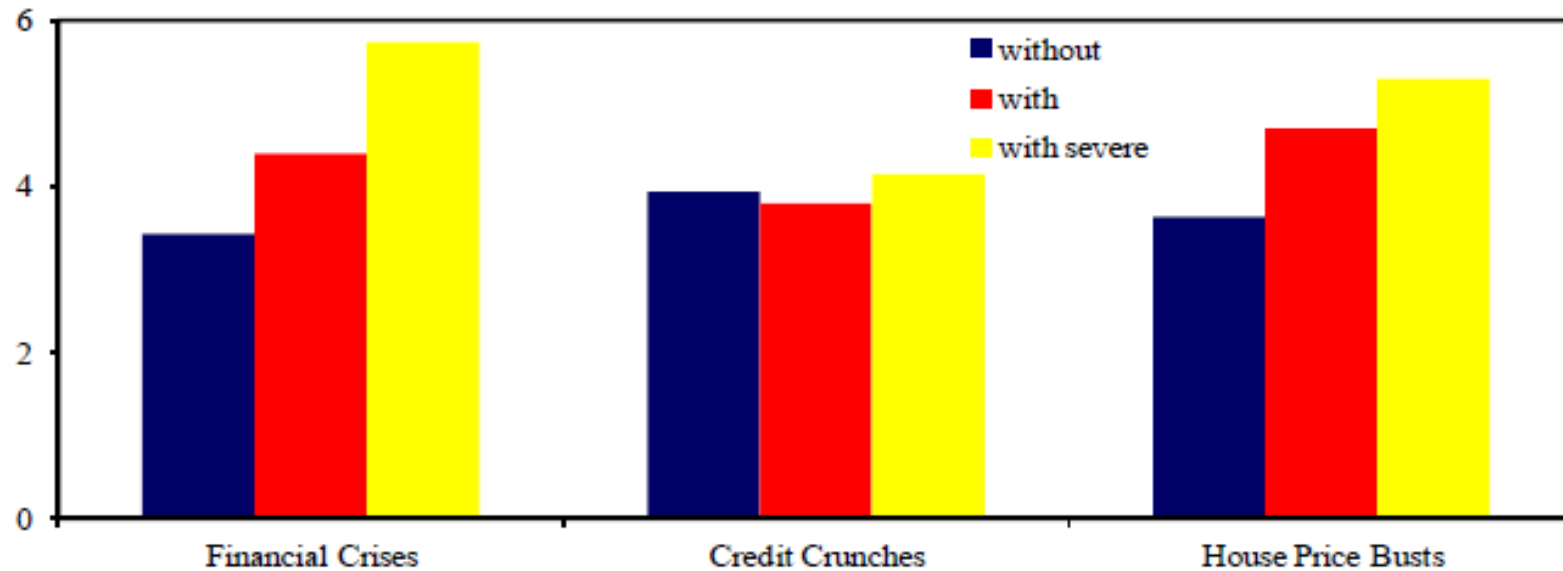


Notes : A recession is associated with a financial crisis if the financial crisis starts at the same time with the recession or one year before or two years after the peak of the recession. The sample includes data for 23 advanced countries and 38 emerging market countries, and covers 1960-2011.

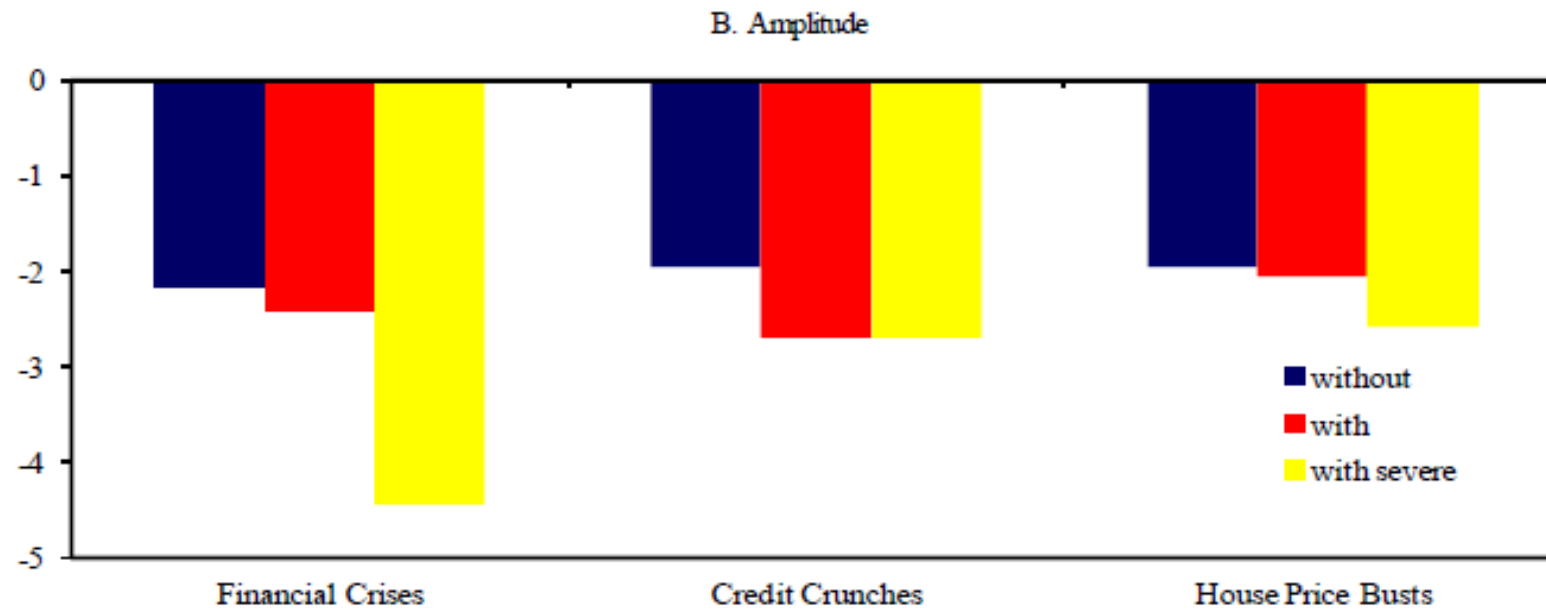
A. Real Effects of Crises

Figure 7. Real Implications of Financial Crises, Crunches, and Busts

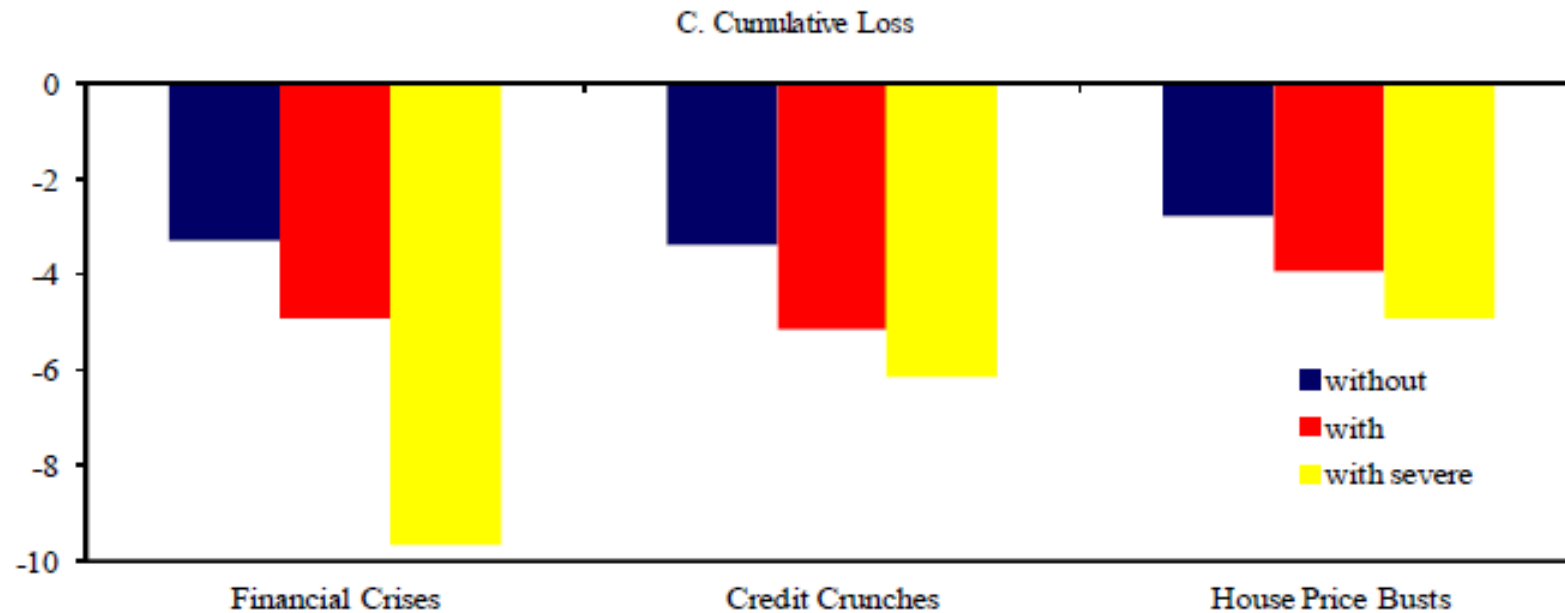
A. Duration



A. Real Effects of Crises



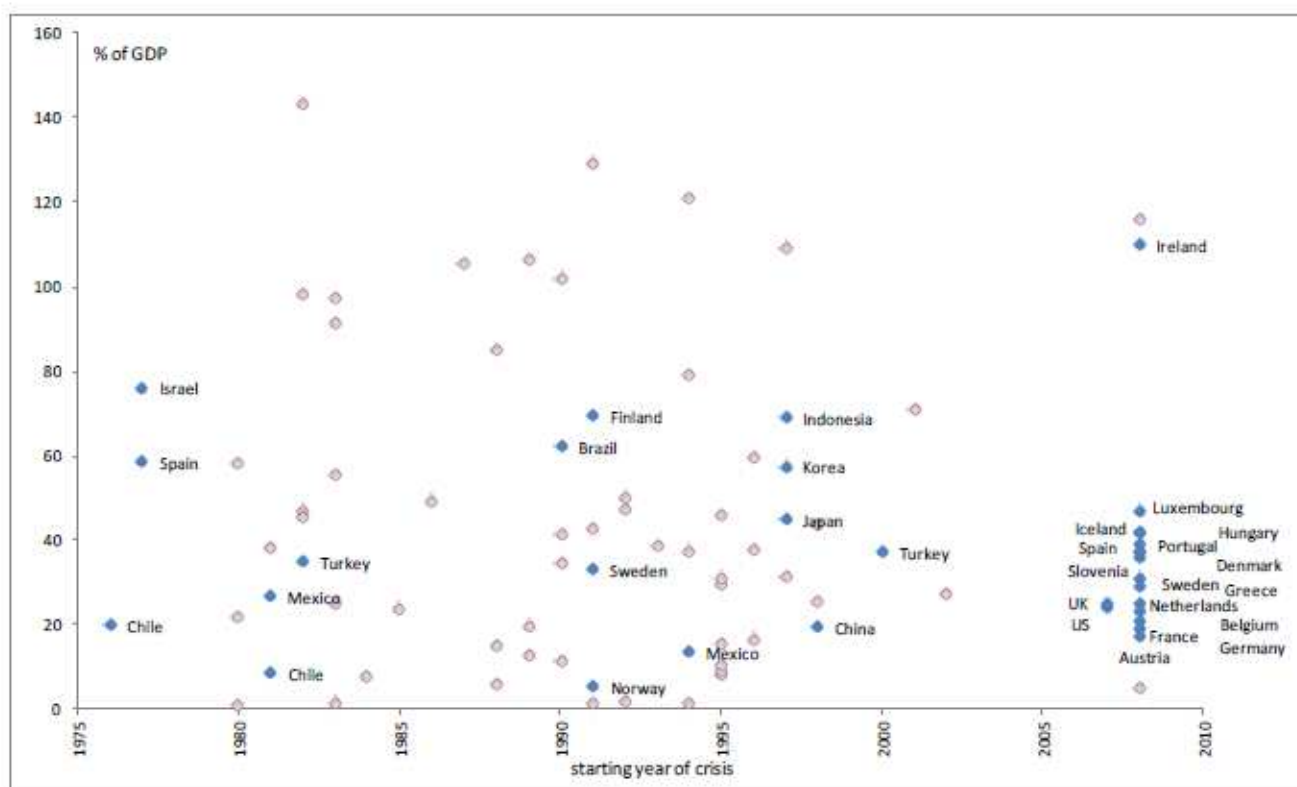
A. Real Effects of Crises



Notes : For "Duration" means are shown, for "Cumulative Loss" and "Amplitude" medians are shown. Amplitude is calculated based on the decline in output from peak to trough of a recession, duration is the number of quarters between peak and trough, and cumulative loss combines information about the duration and amplitude to measure overall cost of a recession and is expressed in percent. Disruptions (severe disruptions) are the worst 25% (12.5%) of downturns calculated by amplitude. A recession is associated with a (severe) credit crunch or a house price bust if the (severe) credit crunch or the house price bust starts at the same time or one quarter before the peak of the recession. A recession is associated with a financial crisis if the financial crisis starts at the same time of the recession or one year before or two years after the peak of the recession. The severe financial crises are the worst 50% of financial crises as measured by output decline during the recession. The sample includes data for 23 advanced countries and covers 1960-2011.

A. Real Effects of Crises

Figure 1. Systemic crises and estimated losses in real output

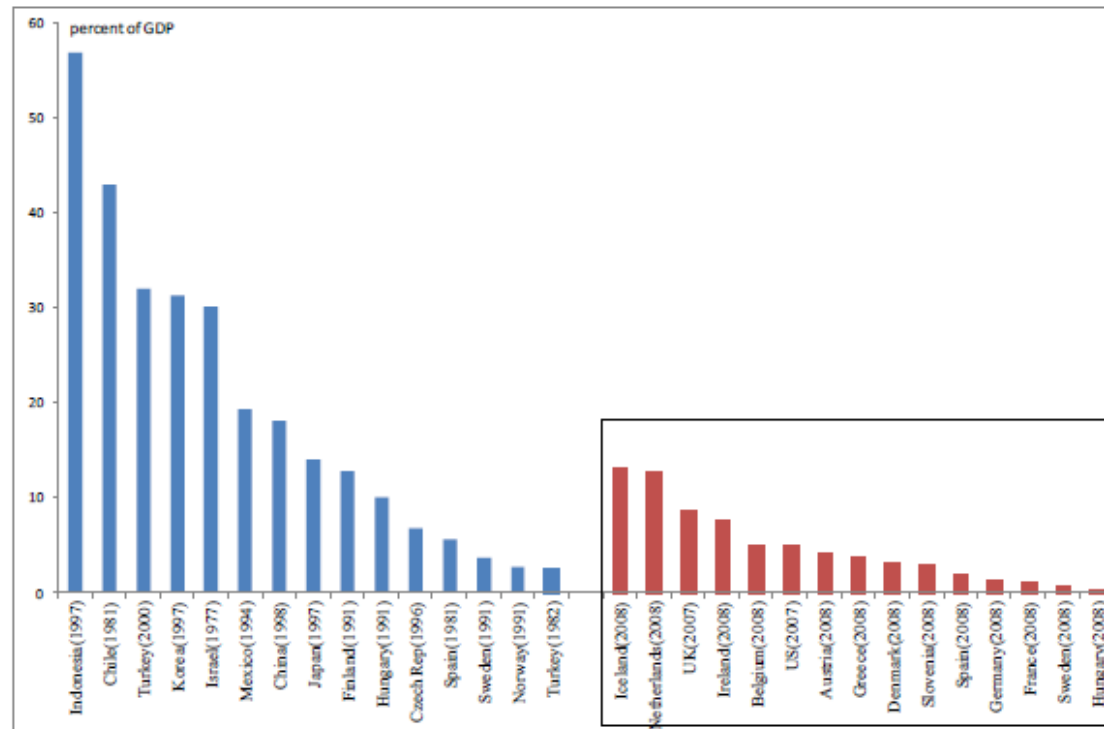


Notes: Systemic banking crises as identified by Laeven and Valencia (2010), including cases "that almost met the definition of a systemic crisis" (i.e. France, Greece, Hungary, Portugal, Slovenia, Spain, and Sweden in 2008; and Brazil in 1990), where estimated output losses are greater than zero. For expositional purposes, the figure does not show instances in which data on output losses are either zero or not available. Dark diamonds indicate CMF member participating jurisdictions (including accession and enhanced engagement) countries, and light-grey diamonds indicate other countries.

Source: Laeven and Valencia (2010).

A. Real Effects of Crises

Figure 2. Systemic crises and estimated gross fiscal costs during the crisis



Notes: Estimated gross fiscal costs incurred throughout the five years since the beginning of the crisis in the case of previous systemic crises up to and including 2007 (Laeven and Valencia, 2008). Estimated gross fiscal costs from either 2007 to 2009 in the case of the United Kingdom and the United States, and from 2008 to 2009 in the case of the other countries shown in the context of the recent financial crisis (based on Laeven and Valencia, 2010). Date in parenthesis denote the starting year of the crisis. Gross fiscal costs include recapitalisation outlays and do not include any recoveries; hence, they are different from net fiscal costs. Deposit insurance payouts are not included in the estimates of fiscal costs associated with the crises in 2007 and 2008. In the case of Iceland, obligations to foreign depositors arising from the Icesave crisis are not included.

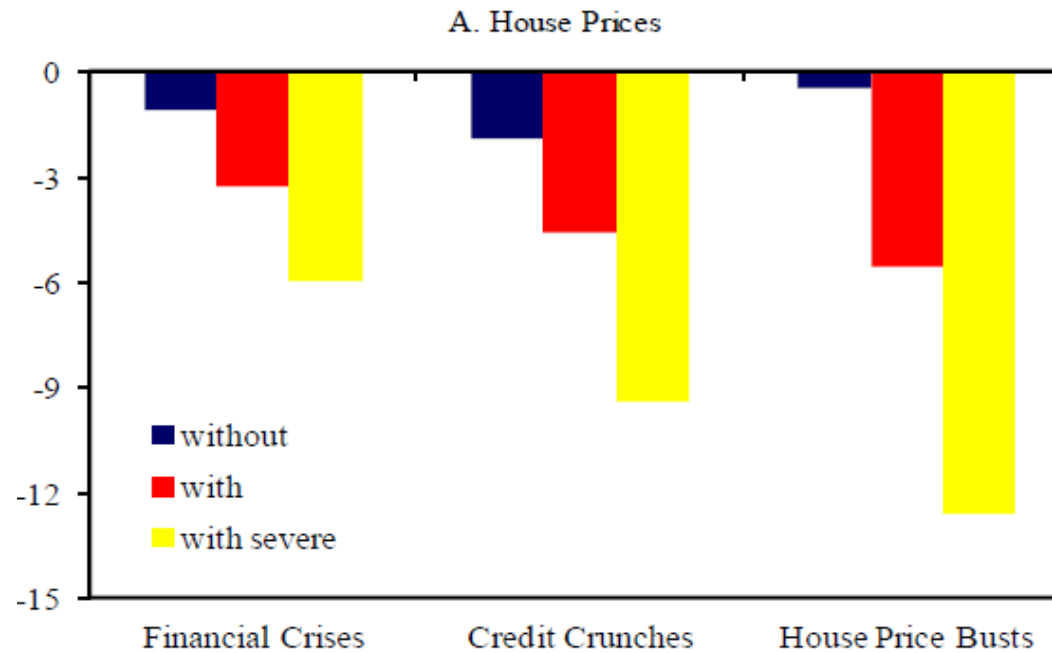
Source: OECD Secretariat calculations based on Laeven and Valencia (2008, 2010).

B. Financial Effects of Crises

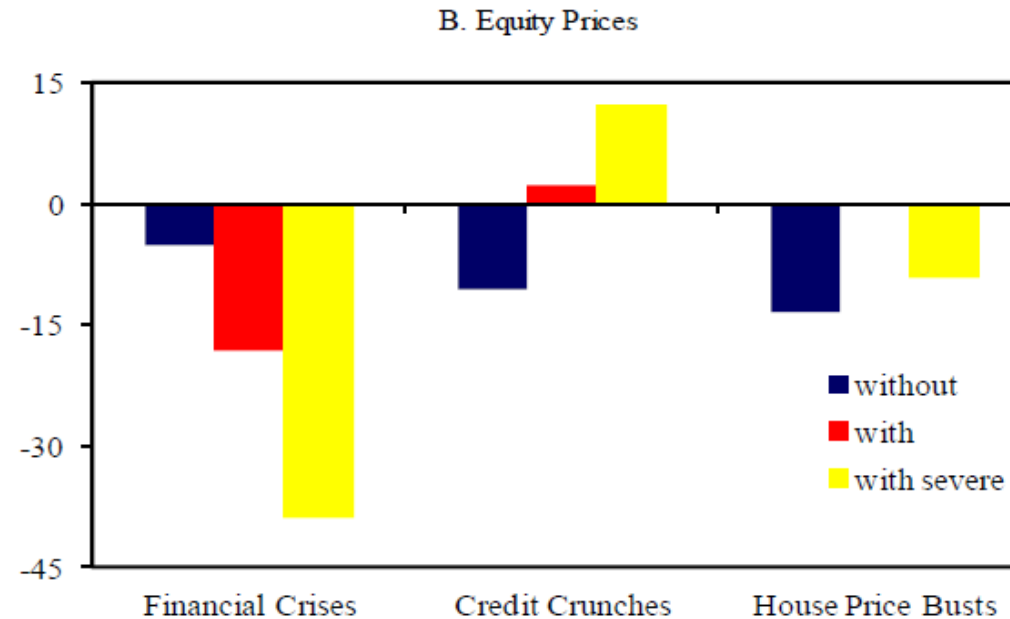
- Important adjustment of financial variables
 - Per definition
 - Loop effects from output to asset prices and risk (countercyclical risk premia)
- Although results differ across the types of crises, both credit and asset prices tend to decline or grow at much lower rates during crises and disruptions than they do during tranquil periods,
- Credit crunch leads to “creditless recoveries” (see EMU for few years)
- Creditless recoveries are more common after banking crises and credit booms that constrain economic growth.

B. Financial Effects of Crises

Figure 8. Financial Implications of Crises, Crunches, and Busts



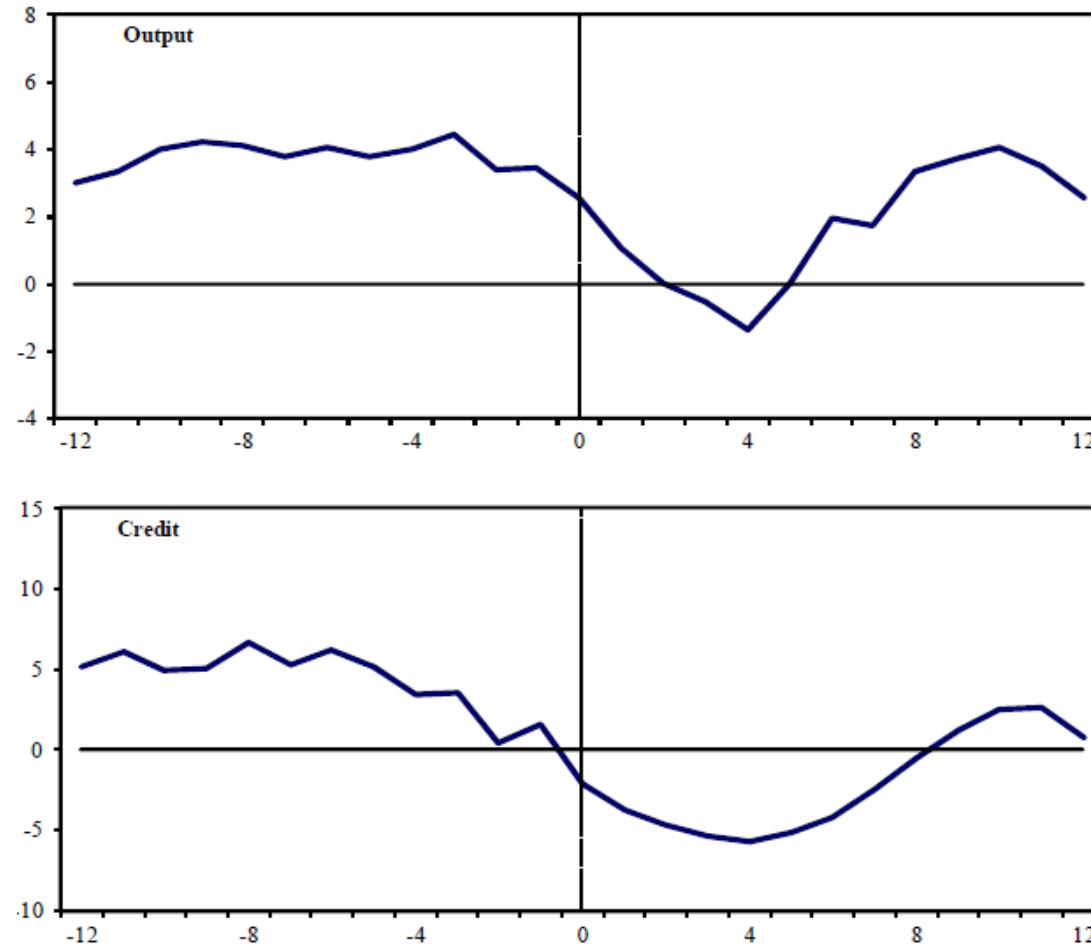
B. Financial Effects of Crises



Notes: Each panel shows the median change in respective variable during recessions associated with indicated financial events. Disruptions (severe disruptions) are the worst 25% (12.5%) of downturns calculated by amplitude. A recession is associated with a (severe) credit crunch or a house price bust if the (severe) credit crunch or house price bust starts at the same time or one quarter before the peak of the recession. A recession is associated with a financial crisis if the crisis starts at the same time of the recession or one year before or two years after the output peak preceding the recession. Severe financial crises are the worst 50% of financial crises as measured by output decline during the recession. The sample includes data for 23 advanced countries and covers 1960-2011

B. Financial Effects of Crises

Figure 9. Creditless Recoveries
(Percent change from a year earlier; zero denotes peak; x-axis quarter)



Roadmap

1. Explaining Financial Crises
2. Types of Financial Crises
3. Identification, Dating and Frequency of Crises
4. Real and Financial Implications of Crises
- 5. Predicting Financial Crises**

Predicting Financial Crises

- The challenge to predict the timing and/or the intensity of crises
 - put in place measures aimed at preventing a crisis from occurring in the first place or
 - limiting the damage if it does happen.
- No single set of indicators has proven to explain the various types of crises
- While it is easier to document vulnerabilities, such as increasing asset prices and high leverage, it remains difficult to predict with some accuracy the timing of crises.

Predicting Financial Crises

- Early warning models have evolved over time, with the successive model generations of crisis
- For the first generation:
 - Growth rates in money, credit, and several other variables exceeding certain thresholds made a banking crisis more likely.
 - appreciation of the real exchange rate (relative to trend), a banking crisis, a decline in equity prices, a fall in exports, a high ratio of broad money (M2) to international reserves, and a recession made a currency crisis more likely

Predicting Financial Crises

- The second generation:
 - substantial short-term debt coming due
 - ratio of broad money to international reserves
 - rapid real exchange rate appreciation, current account deficits, domestic credit expansion, and increases in stock prices.
- The last generation:
 - combination of variables can help identify situations of financial stress and vulnerabilities.
 - Frankel and Saravelos (2012) perform a meta-analysis based on reviews of crises prediction models and seven papers published since 2002.
 - The growth rate of credit, foreign exchange reserves, the real exchange rate, GDP growth, and the current account to GDP

Predicting Financial Crises

- There are both Type I and Type II errors (Dell'Ariccia et al, 2012):
- Not all booms are associated with crises:
 - only about a third of boom cases end up in financial crises.
 - Others do not lead to busts but are followed by extended periods of below-trend economic growth.
 - And many booms result in permanent financial deepening and benefit long-term economic growth.
- While not all booms end up in a crisis, the probability of a crisis increases with a boom.

Predicting Financial Crises

- Finally “crises follow but do not resemble each other”
- Predict the timing is uncertain
- The other way consists in gauging the severity of the disturbances in real time (to manage ex-post)
- But the issue remain the moral hazard (Greenspan’s put, Draghi’s put, etc.)

See you next week....