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Business and Financial Cycles in Emerging Markets

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This Version: May 17, 2015

Abstract: We provide a comprehensive empirical analysis of the implications of recessions and financial disruption episodes for 24 emerging market countries over the period 1978:1-2011:4. We examine how the linkages between key macroeconomic and financial variables evolve around these episodes and their various overlaps. We report four major results. First, recessions associated with financial disruption episodes, such as credit crunches, equity price busts and financial crises, tend to be deeper than other recessions. Second, compared to advanced countries, recessions and financial disruptions in emerging market countries are more costly and protracted. Third, the temporal dynamics of macroeconomic and financial variables around these episodes in emerging markets differ substantially from those in advanced countries. Fourth, changes in credit appear to be significantly associated with the costs recession episodes in emerging markets. We discuss the implications of these findings for economic policy and future research.

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I. INTRODUCTION

The world has experienced in 2009 the deepest global recession in the post–World War II period. In addition to its severity, the recession also qualifies as the most synchronized one, as virtually all of the advanced economies and many emerging market countries experienced a recession. The global recession has led to massive disruptions in cross-border capital flows and financial intermediation. The recessions around the world have coincided with episodes of various forms of financial disruptions, such as severe contractions in the supply of credit, sharp declines in asset prices, or outright financial crises.

While the global economy has been slowly recovering from the recession, the events of the past three years have put the linkages between recessions and periods of financial disruptions to the front burner of research. The objective of this paper is to examine these linkages in the context of emerging market economies. In particular, we attempt to answer the following questions: First, what are the features of recessions and financial disruptions in emerging markets? Second, what is the coincidence between recessions and financial disruptions, and how synchronized are these events around the globe? Third, how does the coincidence between recessions and financial disruptions affect economic outcomes in emerging markets? Fourth, how do monetary and fiscal policies vary by various combinations of these events, and what determines the depth of recessions? For each of these questions, wherever possible, we contrast the experiences of emerging markets economies with those of advanced countries as well.

In order to address these questions, we provide a detailed analysis of the linkages between key macroeconomic and financial variables around recessions and periods of financial disruptions for 24 emerging market countries over the period 1978:1-2011:4. Using a standard business cycle dating algorithm, we first document turning points in our main variables of interest, including output, credit and equity prices. When recessions, credit contractions and equity price declines fall into the top quartiles of all recessions, contractions and declines, we define them as severe recessions, credit crunches and equity price busts.

Armed with these event dates, we conduct a number of analyses. First, we examine the characteristics of these recessions and financial market disruptions—in terms of duration and severity—and the behavior of major macroeconomic and financial variables around these events. Next, we document the coincidence of recessions and credit crunches or equity price busts, and analyze the implications of recessions associated with crunches and busts. In addition to these cases, we also consider the economy-wide effects of recessions associated with financial crises. Lastly, we conduct a formal analysis of the roles played by various factors in affecting the depth of recessions in emerging markets.

Our study contributes to the large body of research analyzing the interactions between macroeconomic and financial variables over the business cycle. Theory indicates that, in a frictionless world, macroeconomic and financial variables can interact closely, through wealth

and substitution effects, and in affecting resource allocations (e.g., Blanchard and Fischer, 1989; Obstfeld and Rogoff, 1999). Asset prices can influence consumption through their impact on household wealth, and can affect investment by altering a firm's net worth and the market value of the capital stock relative to its replacement value. Asset prices like interest and exchange rates can affect the allocation of resources across time and countries.

In a world with financial frictions, the interactions between financial variables and the real economy can be amplified by financial accelerator and related mechanisms operating through firms' and households' balance sheets. According to these mechanisms, an increase (decrease) in asset prices improves a firm's (or household's) net worth, enhancing (reducing) its capacities to borrow, invest and spend. This process, in turn, can lead to further increases (decreases) in asset prices and can have general equilibrium effects (see Bernanke and Gertler, 1989).¹ This literature also suggests that the impact of financial variables can be expected to become more pronounced during recessions than during booms.

There is also a rich set of theoretical studies analyzing the implications of financial disruptions for the real economy in the context of emerging market countries. For example, Krugman (1999) and Aghion, Bacchetta and Banerjee (2000) show how a combination of financial market imperfections and currency mismatches can translate into highly volatile business cycle fluctuations in emerging markets. Cespedes, Chang and Velasco (2004) study how linkages between exchange rates and corporate balance sheets affect macroeconomic outcomes in small open economies using the financial accelerator construct.² Caballero and Krishnamurthy (1998) and Schneider and Tornell (2004) model how, also because of balance sheet constraints, fluctuations in credit and asset markets translate into boom-bust cycles in emerging market economies.³

Several empirical studies provide evidence of these effects in the context of advanced and emerging market economies. There is a large empirical literature for advanced countries analyzing the dynamics of business cycles, asset price fluctuations and credit cycles (see Bernanke and Gertler, 1989; Borio, Furfine and Lowe, 2001), including studies based on micro

¹ A number of studies, emphasizing different aspects of financial imperfections, show how similar mechanisms can play an important role in accentuating macroeconomic fluctuations. Kiyotaki and Moore (1997) consider the role of endogenous movements in asset prices as the driving force of changes in corporations' balance sheets. Suarez and Sussman (1997) show that fire sales by bankrupt corporations lead to declines in asset prices and in turn to cycles in the real economy.

² In particular, Cespedes, Chang and Velasco (2004) extend the model of Bernanke, Gertler and Gilchrist (1999) and show that negative external shocks can have a magnified impact on output because of the balanced sheet effects stemming from a (real) devaluation.

³ Recent research also considers how fluctuations in asset prices affect the value of collateral required for international funding. Mendoza (2009) show that when borrowing levels are high relative to asset values, shocks to collateral constraints can generate an amplification mechanism, like the debt-deflation mechanism of Irving Fisher (1933), and result in large effects of output.

data (banks or corporations) (see Bernanke, Gertler and Gilchrist, 1996; Kashyap and Stein, 2000). Recent research considers how the interactions between financial and real activity variables vary during recessions in advanced countries. For example, Claessens, Kose, and Terrones (2009) report that recessions in advanced countries associated with crunch or bust episodes are typically longer and deeper than normal recessions. However, our knowledge of interactions between real and financial sectors during periods of downturns in emerging markets has been rather limited.

We contribute also to a branch of the literature on business cycles which aims to identify the turning points in macroeconomic and financial variables using various methodologies. The classical methodology of dating business cycles, applied here as well, goes back to Burns and Mitchell (1946). It has been widely used over the years (Harding and Pagan, 2006) to study recessions in advanced countries. Only a few studies (see Calderon and Fuentes, 2006; and du Plessis, 2006) have used this methodology to analyze the turning points of business cycles in emerging markets using quarterly data. However, these studies have focused mostly on the behavior of output employing generally small samples of countries over relatively short time periods.⁴

Importantly, the links between real and financial variables during recessions have yet to be analyzed using a comprehensive dataset of a large number of emerging market countries over a long period. Although the roles played by financial variables in business cycles have received some attention, most studies consider the topics of business cycle, credit and asset prices independently (or in isolation).⁵ Few have studied the behavior of financial variables over the business cycle, and none has done so for emerging markets.⁶ Apart from analyses limited to a small number of cases and some other “case-type” studies of individual episodes, and some studies that focuses specifically on the behavior of real and financial variables surrounding

⁴ Calderon and Fuentes (2006) consider a sample of 14 emerging market economies over 1980-2005 and du Plessis (2006) studies 7 emerging economies using a data sample mostly covering the period 1980-2004. Using annual data, Hong, Lee, and Tang (2009) examine the links between macroeconomic fluctuations and financial crises in 21 Asian emerging and developing economies. Gupta and Miniane (2009) provide an analysis of recessions and recoveries using quarterly data of 8 emerging countries for the 1980-2008 period.

⁵ We do acknowledge of course the large and growing literature analyzing various aspects of business cycles in emerging economies using a variety of methods. For example, Kose (2002) and Neumeyer and Perri (2005) use stochastic dynamic models to consider the implications of various types of shocks for business cycles in emerging markets. Kaltani and Loayza (2005) and Kose, Prasad and Terrones (2006) analyze empirically the linkages between long-term growth and short-term business cycles volatility using panel regressions. Kose, Prasad and Terrones (2003) examine the synchronization of cycles across emerging and advanced countries using various methods, including dynamic factor models. However, none of these papers consider financial cycles.

⁶ Exceptions for advanced countries are Helbling and Terrones (2003), which examine the implications of asset price booms and busts for a large set of countries, and Borio and McGuire (2004) and Pagan and Sossounov (2003) in the context of mostly advanced countries.

financial crises, notably Reinhart and Rogoff (2009), to the best of our knowledge, there is no comprehensive empirical analysis of these links in the context of emerging market countries.⁷

Our paper thus fills several gaps in the literature. First, we study the features of episodes of recessions, credit crunches, and equity price busts in terms of a sizeable set of macroeconomic and financial variables for a large number of emerging market countries over a long period of time. Second, our study is the first detailed, cross-country empirical analysis addressing the implications of a recession coinciding with certain types of financial market disruptions for emerging markets. Third, it provides a comprehensive analysis of how recessions and financial market disruptions in emerging markets differ from those in advanced countries. Finally, we consider the determinants of the cost of recessions and analyze the importance of various factors in explaining the depth and violence of such episodes in emerging markets.

The paper is structured as follows. Section 2 presents our dataset and methodology. Section 3 examines the basic characteristics of recessions and episodes of credit contractions and equity price declines in emerging markets and compares these with the experiences of advanced countries. Section 4 studies the implications of recessions associated with credit crunches, equity price busts and financial crises. In Section 5, we provide a brief discussion of the changes in policy variables during various episodes of recessions, crunches, busts and crises. Section 6 provides a more formal analysis of the roles played by various factors in determining the cost of recessions, using some simple regression models. Section 7 concludes.

II. DATA AND METHODOLOGY

II.1. Database

Country coverage

We construct a comprehensive database of macroeconomic and financial variables for 24 emerging market countries over the period 1978:1-2011:4. The emerging market countries in our sample are Argentina, Bolivia, Brazil, Chile, China, Colombia, Costa Rica, Ecuador, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, Philippines, Singapore, South Africa, Taiwan, Thailand, Turkey, Uruguay, and Venezuela.⁸ We compare the features of

⁷ Barro and Ursúa (2008) study the features of macroeconomic crises since 1870 and consider the implications of crises for financial variables such as equity risk and bond-bill premium. However, given their focus on (the aftermath of) crises, the Barro and Ursúa (2008) and the Reinhart and Rogoff (2009) studies are silent on the evolution of macroeconomic and financial variables over the different phases of business and financial cycles. Moreover, they do not investigate credit and asset prices and their links with the economic cycles. Cecchetti, Kohler and Upper (2009) consider the implications of financial crises for economic activity, but do not consider emerging markets.

⁸ The emerging markets roughly correspond to those included in the MSCI Emerging Markets Index. The main differences are that because of the data limitations we drop some countries (Czech Republic, Egypt, Jordan, (continued)

emerging economies with those of advanced countries, where we use the sample of 21 OECD countries over the same time period. The OECD countries in our sample are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Switzerland, Sweden, the United Kingdom, and the United States.

While together the emerging and advanced countries in our sample account for more than 90 percent of global output, the difference between the typical emerging market and the typical advanced country is quite large. In terms of the typical country, per-capita income levels are much lower in emerging markets, about one-third of that in the typical OECD country. In terms of overall economic size, the total (US dollar) GDP is also much lower for the typical emerging market, about 25 percent that of the typical advanced country. The typical emerging market country in the sample trades, however, relatively more with the rest of the world than the typical advanced economy does. The standard trade openness ratio for the emerging market group is close to 80 percent while it is around 50 percent for advanced countries in 2005. In contrast, when it comes to the extent of financial linkages with the rest of the world, the advanced economies are definitely more integrated to the world financial markets than the emerging countries.

While different from advanced countries, the emerging market countries in our sample are at the same time quite different from the overall group of developing countries. The emerging markets in our sample have attained a much higher level of integration into global trade and finance relative to most developing countries. For instance, the average growth rate of total trade (exports plus imports) has been more than twice the growth rate of GDP in the emerging markets since the mid-1980s, while the corresponding figure for other developing economies is much lower. The emerging economies are also much more financially integrated. Over the last two decades, the total gross stocks of foreign assets and liabilities of emerging markets have risen more than five-fold and are now an order of magnitude larger than those of developing countries.

Coverage of macroeconomic and financial variables

Our analysis focuses on recessions and financial market disruptions, which dictates our data choices (details on the sources and definitions of all our variables are contained in Appendix I). In particular, we study the following macroeconomic variables: output, consumption, investment, industrial production, exports, imports, net exports, current account balance, and rates of unemployment and inflation. The quarterly time series of macroeconomic variables are seasonally adjusted, whenever necessary, and are in constant prices. We also consider the behavior of export and import prices, terms-of-trade, nominal and real exchange rates.

Hungary, Morocco, Pakistan, Poland, and Russia), while we include a number of other emerging markets (Bolivia, Costa Rica, Ecuador, Hong Kong, Singapore, and Venezuela).

The financial variables we consider are credit and equity prices.⁹ Credit series are from the IFS and defined as claims on the private sector by deposit money banks. These are also the series used in earlier cross-country studies on credit dynamics (Mendoza and Terrones, 2008).¹⁰ Equity price indices are from the IFS and generally cover the main local stock exchanges. All financial variables are converted into real terms using their country's respective consumer price indexes (CPI).¹¹

The “policy” variables we focus on are related to fiscal and monetary policy. There are many other ways in which policy makers can respond to a recession, credit crunch, equity price bust, or a financial crisis. These include, besides monetary and fiscal policies, interventions in the financial and corporate sectors, quasi-fiscal operations, changes in exchange rate management, structural reforms etc. To keep matters manageable, and to retain comparability across the diverse set of countries and events under consideration, however, we only considered these two policy responses. For fiscal policies, we use changes in (real) government consumption. For monetary policies, we consider both nominal and real (deflated using the (ex-post) CPI series) short-term rates. We also report, however, the nominal and real long-term interest rates.

II.2. Methodology

There has been a rich research program devoted to the definition and measurement of business cycles (Harding and Pagan, 2006). Our study is based on the “classical” definition of a business cycle mainly because of its simplicity and widespread use in policy circles, but also because it constitutes the guiding principle of the National Bureau of Economic Research (NBER) in determining the turning points of U.S. business cycles. This definition goes back to the pioneering work of Burns and Mitchell (1946) who laid the methodological foundation for the analysis of business cycles in the United States (see Claessens, Kose and Terrones, 2009).

Burns and Mitchell (1946) define a cycle as *“consist[ing] of expansions occurring at about the same time in many economic activities, followed by similar general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of changes is*

⁹ In our earlier work for advanced countries, we also studied housing price data, but these prices are not available for a long period for a large enough sample of emerging markets. We are in the process of expanding housing price series for emerging markets and we plan to report the relevant results associated with these series in the next version of this paper.

¹⁰ Many papers examine the behavior of aggregate credit measures during recessions or financial crises. In the context of the ongoing crisis in the U.S., some recent papers are Chari, Christiano and Kehoe (2008); and Cohen-Cole et. al, (2008). These studies highlight that it is important to go beyond aggregate measures (for example, differentiating credit to corporations from credit to households). However, this is extremely difficult, if not impossible, in the context of our large cross-country coverage.

¹¹ We are in the process of putting together a database of quarterly series of international financial flows, including foreign direct investment flows, portfolio and debt flows, and reserves, for these countries. Armed with these series, we will provide a more detailed analysis of the linkages between recessions and financial flows in the next version of the paper.

recurrent but not periodic; in duration, business cycles vary from more than one year to ten or twelve years.” Following the spirit of their characterization of a business cycle, the NBER (2001) defines a recession as “*a significant decline in activity spread across the economy, lasting more than a few months, visible in industrial production, employment, real income, and wholesale-retail trade.*” A recession begins just after the economy reaches a peak of activity and ends as the economy reaches its trough.

This “classical” methodology focuses on changes in levels of economic activity. An alternative methodology would be to consider how economic activity fluctuates about a trend, and then to identify a “growth cycle” as a deviation from this trend (Stock and Watson, 1999). The classical methodology is preferable, however, for our purposes. It provides a well-defined set of cycles, rather than having to consider how they depend on the specific detrending method used.¹² The turning points identified by using the classical methodology are also robust to the inclusion of newly available data: in other methodologies new data can affect the estimated trend and thus the identification of a growth cycle.

For the specific dating, we employ the algorithm introduced by Harding and Pagan (2002a), which extends the so called BB algorithm developed by Bry and Boschan (1971), to identify the turning points in the *log-level* of a series.¹³ We search for maxima and minima over a given period of time. Then, we select pairs of adjacent, locally absolute maxima and minima that meet certain censoring rules, that is, a certain minimal duration for cycles and phases. In particular, the algorithm requires the durations of a complete cycle and of each phase to be at least five quarters and two quarters respectively. Specifically, a peak in a quarterly series y_t occurs at time t if:

$$\{(y_t - y_{t-2}) > 0, (y_t - y_{t-1}) > 0\} \text{ and } \{(y_{t+2} - y_t) < 0, (y_{t+1} - y_t) < 0\}$$

Similarly, a cyclical trough occurs at time t if:

$$\{(y_t - y_{t-2}) < 0, (y_t - y_{t-1}) < 0\} \text{ and } \{(y_{t+2} - y_t) > 0, (y_{t+1} - y_t) > 0\}$$

We then define a complete cycle from one peak to the next with two phases, the contraction phase (from peak to trough) and the expansion phase (from trough to peak). Our main

¹² Alternative methodologies for analyzing the features of business cycles are relevant if the particular interest is in studying cyclical deviations from a trend, i.e., growth cycles. However, in that case, the results depend very much on the choice of the detrending methodology (see Canova, 1998). Several studies document the features of business fluctuations using the methodology of growth cycles (see Backus, Kehoe and Kydland (1995) for advanced countries and Agenor, McDermott and Prasad (2000) for emerging economies).

¹³ The algorithm we employ is known as the BBQ algorithm since it is applied to quarterly data. It is possible to use a different algorithm, such as a Markov Switching (MS) model (Hamilton, 2003). Harding and Pagan (2002b) compare the MS and BBQ algorithm and conclude that the BBQ is preferable because the MS model depends on the validity of the underlying statistical framework. Artis, Kontolemis, and Osborn (1997) and Harding and Pagan (2002a) also use the BBQ methodology.

macroeconomic variable is output (GDP) which provides the broadest measure of economic activity.

We use the same approach to identify the turning points in our financial series.¹⁴ In terms of financial variables, we consider cycles in real credit and equity prices. We are especially interested what happens when there is a coincidence of output recessions and financial disruptions. To investigate these coincidences, we apply a simple “dating” rule for whether or not a specific recession is associated with a credit crunch or an equity price bust. If a recession episode starts at the same time as or after the start of an ongoing credit crunch or asset price bust, then we consider the recession to be associated with the respective crunch or bust. By definition, this rule describes a “timing” association (or coincidence) between the two events, but does not imply a causal link.

The main characteristics of cyclical phases are their duration and amplitude. Since we are mainly interested in examining contractions (recessions in output and declines in financial variables), we define these characteristics for contractions only. The duration of a contraction, D^c , is the number of quarters, k , between a peak and the next trough. The amplitude of a contraction, A^c , measures the change in y_t from a peak (y_0) to the next trough (y_k), i.e., $A^c = y_k - y_0$. For output, we consider another widely used measure, cumulative loss, which combines information on duration and amplitude to proxy for the overall cost of a contraction. The cumulative loss, F^c , during a contraction, with duration k , is defined as:

$$F^c = \sum_{j=1}^k (y_j - y_0) - \frac{A^c}{2}.$$

We further classify recessions based on the extent of decline in output. In particular, we call recessions mild or severe if the peak-to-trough output drop falls within the bottom or top quartile respectively of all output drops in each group of countries we study. Similarly, a credit crunch is defined as a peak-to-trough contraction in credit which falls within the top quartile of all credit contractions.¹⁵ Likewise, an equity price bust is defined as a peak-to-trough decline which falls within the worst quartile of all price declines. A severe credit crunch or equity price bust is defined as the top 1/8 of all credit contractions or equity price busts.

¹⁴ In the case of equity prices, the constraint that the contraction phase must last at least 2 quarters is ignored if the quarterly decline exceeds 20 percent. Since equity prices can show much greater intra-quarter variation, making for large differences between peaks and troughs for end-of-quarter data than when using higher frequency data.

¹⁵ We rely on changes in the volume of (real) credit to identify episodes of credit crunch. Crunches are often defined as an excessive decline in the supply of credit that cannot be explained by cyclical changes in demand (see Bernanke and Lown, 1991). It is very difficult, however, to separate the roles played by demand and supply factors in the actual volume of credit extended. An alternative methodology to identify credit crunch episodes would be to consider prices measures, i.e., track changes in interest rates over time. However, data limitations do not allow us to employ such measures for our large sample of countries.

In emerging market countries, we identify 84 output recessions (21 of which are severe), 107 credit contractions (26 crunches), and 136 declines (34 busts) in equity prices. In comparison, for the sample of advanced countries, we identify 81 output recessions (20 of which are severe), 71 credit contractions (17 crunches), and 152 declines (38 busts) in equity prices. Although the samples of events appear to be similar in terms of numbers, it is important to note that our dataset includes countries with shorter time-series over the full period. In terms of recessions and financial market disruptions, among the events we analyze, there is considerable overlap: 14 and 25 recession episodes are associated with credit crunches and equity price busts, respectively (Figure 1). In other words, in about one in 6 recessions, there is also a credit crunch underway, and in about one in 3 recessions, an equity price bust is underway. In terms of financial crises, of the 84 recessions, 20 are associated with crises dated by Laeven and Valencia (2008). Of these 20, 5 were also credit crunches, 10 equity price busts, and of these, 4 were both credit crunches and equity price busts.

As we discuss above, a number of studies focus on growth cycles using annual data of emerging market countries. By construction, the use of annual data makes it impossible to identify recessions that are shorter than four quarters, unless these recessions are characterized by large enough declines in some quarters' output that in turn lead to contractions in annual output. In our sample, for example, the number of recessions goes down to 67 if one simply defines recessions as contractions in yearly output.

How successful is our algorithm in replicating the well-know turning points of the NBER? Our algorithm replicates very well the dates of U.S. business cycles as determined by the NBER. According to the NBER, the U.S. experienced eight recessions over the 1960-2011 period. Our algorithm provides exact matches for four out of these seven peak and trough dates and is only a quarter early in dating the remaining peaks and troughs.¹⁶ The main features of our business cycles are quite similar to those of the NBER as well. For example, the average duration of U.S. business cycles based on our turning points is the same as that reported by the NBER. In addition, the average peak-to-trough decline in output during U.S. recessions is about -1.7 percent based on our dates and -1.4 percent based on NBER dates.

III. RECESSIONS, CREDIT CONTRACTIONS AND ASSET PRICE DECLINES

III.1. Basic Features of Recessions: Duration and Cost

Table 1A presents the main characteristics of the recessions in our sample of emerging markets. We most often focus on medians because they are less affected by the presence of outliers. Wherever relevant, however, we refer also to averages and the standard deviation measuring the

¹⁶ These differences stem from the fact that the NBER uses monthly data for various activity indicators (including industrial production, employment, personal income net of transfer payments, and volume of sales from the manufacturing and wholesale retail sectors), whereas we use only quarterly output series to identify cyclical turning points.

dispersion in our sample. A typical emerging country experienced about four recessions. There is no apparent pattern to the number of recessions across countries, although some countries stand out. Two of the largest emerging markets, namely China and India, did not go through any recessionary periods during the period we examine. And while Korea and Indonesia experienced only two recessions, Brazil suffered nine and Argentina eight recessions. However, since the length of available data series differs slightly across the emerging countries in our sample, it is difficult to compare the absolute number of recessions across countries.

A better metric to analyze the intensity of contractionary periods of activity is the proportion of time a country has been in a recession, defined as the fraction of quarters the economy is in recession over the full sample period. According to this metric, Argentina and Venezuela were in recession for about one-third of the sample period, but Chile, Indonesia, Korea, Malaysia and Taiwan went through a period of contraction for less than 10 percent of the sample duration. Since this metric adjusts for the length of data series, we can compare it to the same measures for advanced countries. The comparison shows that the fraction of time spent in recession is typically 50 percent longer for the group of emerging economies than for the group of advanced countries.

There is no noticeable difference across emerging and industrialized countries, however, in terms of the average duration of recessions. In emerging markets, an average recession lasts about four quarters (3.92), while in advanced countries, the average recession lasts slightly less, 3.73 quarters.¹⁷ In emerging markets—identical to the sample of advanced countries, the shortest recession is (by definition) two quarters and the longest thirteen quarters (in South Africa over the period 1989:3-1992:4). Roughly 35 percent of all recessions are short-lived, meaning only two quarters of output decline. As we indicated earlier, these short-lived recessions would most often not be detected when using annual data (except if the declines in the two quarters are severe enough to lead to an overall GDP decline for the year).

The median (average) decline in output from peak to trough, the recession's amplitude, is about 4.8 (6.5) percent. It ranges from about 1.7 percent for the typical recession in Costa Rica to more than 10 percent for recessions in Peru, Thailand, and Venezuela. The amplitude of a typical emerging country recession is about 3 times larger than that of advanced country. The slope of a recession, defined as the ratio of its amplitude to duration, is also typically much larger in emerging economies than industrialized countries, -1.2 versus -0.4, suggesting that recessions in emerging market countries are more violent macroeconomic events.

The cumulative loss for a typical (median) recession is about 9 percent in emerging markets, but the average loss is about 17 percent since the distribution is very skewed to the right. Recessions

¹⁷ Recovery is faster in emerging markets, however, than in advanced countries, suggesting that the V-shape recovery is more typical in emerging markets than in advanced countries. We are in the process of analyzing the dynamics of recoveries in emerging market countries in a separate research project.

in emerging market countries thus lead to much larger cumulative losses than those in advanced economies. In particular, a typical recession is associated with more than three times larger cumulative loss in an emerging market country than it is for an advanced economy (9 versus 3 percent).

These findings are consistent with the widely documented result that macroeconomic fluctuations in emerging markets are typically more pronounced than those in advanced economies (Kose, Prasad and Terrones, 2007). These raw statistics suggest that, while recessions in emerging markets are typically not much more frequent and not longer than those in advanced countries, when recessions occur in emerging markets, they do tend to be much faster and deeper than in advanced countries. This is in part as many recessions in emerging markets are associated with sudden stops in capital inflows and financial crises.

A recession is classified as severe when the peak-to-trough decline in output is in the bottom one-quarter, or below -8.4 percent. While a number of emerging market countries (including Singapore, Taiwan, Colombia, Costa Rica, South Africa and Ecuador) did not experience severe recessions in the sample period, Argentina went through four such episodes, and Venezuela, Peru and Turkey experienced two of them. The 21 such recessions typically last for five quarters, a quarter longer than the average recession. By construction, severe recessions are much more costly than other recessions, with a median decline of about 13 percent and a cumulative loss of about 27 percent, almost three times more costly than that of other recessions. These recessions are much more virulent, with a slope coefficient three times greater than that of other recessions. Comparing with advanced countries, the typical recession in emerging economies is like a severe recession in advanced countries in terms of its amplitude and cumulative loss.

What about depressions? An extremely severe recession, in which the peak-to-trough decline in output exceeds 10 percent, is usually called a depression. A stunning number of seventeen out of 21 severe recessions in emerging market economies can be categorized as depressions. This is a much greater number than in the sample of advanced countries where there was only one depression: Finland (1990:1-1993:2). It coincided with the transition to open regimes in Eastern Europe and the Soviet Union which led to severe trade disruptions for Finland. The depression lasted 13 quarters with an output decline of 13 percent. This depression thus compares to a typical severe recession in emerging economies, which also has a decline of 13 percent, but its duration is much shorter, only five quarters.

A further illustration of the distribution of recessions is provided in Figure 2. It shows that most recessions in emerging markets lasted 4 quarters or less, and the overwhelming majority of these were mild to moderate in depth. Specifically, roughly 30 percent of all recessions last 2 quarters, 40 percent last 3-4 quarters, and 30 percent last 5 quarters or more. It also shows that the shorter recessions tended to be milder or moderate. Of the severe recessions, however, most lasted more than 5 quarters. Comparing the two subperiods shows that, unlike the pattern of Great

Moderation in advanced countries, the depth and duration of recessions in emerging markets have not moderated over time.

III.2. Changes in Macroeconomic and Financial Variables During Recessions

We next examine how the main macroeconomic and financial variables typically vary during a recession in emerging economies. Table 1B presents the peak-to-trough changes in key variables for all, severe, and non-severe (other) recessions, where we also investigate for statistically significant differences. Not surprisingly, there are often significant differences between severe and non-severe recessions, not only in terms of duration, slope, amplitude and cumulative output loss, but also in terms of the components of output and other macroeconomic and financial variables. We will discuss these in turn. We can also compare the features of recessions in emerging markets with the features of recessions in advanced countries, as presented in Table 1C.

We find the expected patterns, with most macroeconomic variables exhibiting procyclical behaviors. In a severe recession, consumption typically drops by more than 11 percent, compared to only 1 percent decline in other recessions. In contrast, consumption registers only a marginal fall (around 0.2 percent) during a typical recession in advanced countries. The decline in consumption during severe recessions in advanced countries tends to be one-tenth of that in emerging markets. In roughly 70 (50) percent of recessions, consumption registers a fall in emerging (advanced) countries. These results echo the implications of the lack of consumption risk sharing in emerging market countries documented in a number of earlier studies (see Kose, Prasad and Terrones, 2009).

The special role played by investment dynamics in explaining business cycles has been stressed in the literature. Indeed, the decline in investment is typically about 13 percent, much larger than the drop in output, but also with a large variation. While the drop is 10 percent in other recessions, it becomes 45 percent in severe recessions. The median decline in investment in emerging markets during recessions (severe recessions) is 3 (4) times larger than that in advanced countries.

Recessions in emerging markets tend to be associated with increases in exports, but there are not significant differences between severe and other recessions in terms of behavior of this aggregate. Imports contract more than 25 percent during severe recessions while they decline by only 8 percent during others. This is mostly due to the sharp depreciation of exchange rates during severe recessions. Both net exports and current account dynamics register substantial improvements during severe recessions—this reflects both a contraction in domestic demand and a real depreciation of the domestic currency.

These patterns are different than those observed in advanced countries, for which recessions often overlap with declines in international trade. Both exports and imports drop in advanced

countries; recessions, although the declines in imports tend to be much larger than the decline in exports. Similar to emerging market economies therefore, both net exports and current account balance improve during recessions in advanced countries as well.

In terms of other macroeconomic variables, the comparisons are as expected. The fall in industrial production tends to be large in a typical recession, almost twice that of output. However, in severe recessions, industrial production tracks the drop in output very closely. The rate of unemployment increases by about 1 percent during a typical recession, but tends to be three times larger in severe recessions. Comparing with advanced countries, recessions in emerging market countries translate into larger increases in unemployment rates and larger contractions in industrial production.

The increase in the inflation rate is less than 1 percent in a typical recession as inflation goes down in only 40 percent of all recessions in emerging markets. This is quite different compared to the pattern observed in advanced countries where inflation typically drops slightly (in 60 percent of recessions). The increase in inflation in emerging markets is driven by the severe recessions episodes combined with periods of hyperinflation. Export and import prices fall somewhat and more so in the severe recessions. But the decline is similar for export and import prices, explaining why the terms of trade do not change much.

Associated with the hyperinflation episodes are large drops in the real and nominal (effective) exchange rates. The exchange rate depreciations are very large in severe recessions, some 55 percent in nominal terms and some 27 percent in real terms. In other recessions, the drop is smaller, 5 and 1 percent respectively for the nominal and real exchange rates. The high inflation gets partly reflected in the changes in the short-term nominal and real interest rates which we discuss later in the paper.

In terms of our financial variables, equity prices typically fall in recessions, with much larger declines in severe recessions than in other recessions. In particular, while the decline in equity prices during recessions is about 18 percent, during severe recessions the decline is roughly 46 percent. Credit tends to contract by about 2 percent in a typical recession, but it shrinks by roughly 20 percent during severe recessions. Credit declines in about 60 percent of recessions and equity prices in about 70 percent of all cases. These declines are much larger than those typically observed in advanced countries where credit declines in less than 40 percent of recessions and equity prices fall in 60 percent of them.

III.3. Dynamics of Recessions

We next examine how various macroeconomic, trade and financial variables behave about recessions. We focus on patterns in year-on-year growth in each variable for a 6-year window—12 quarters before and 12 quarters after a peak (**Figure 3**). We focus on year-on-year changes in the relevant variables since quarter-to-quarter changes can be quite volatile and provide a noisy

presentation of recession dynamics. All panels include median growth rates, along with the top and bottom quartiles, which imply that according to our definition, the severe recessions are in the bottom quartile.

The evolution of output growth about a recession is as expected. Following the peak at date 0, output tends to register negative annual growth after 2 quarters, going down to -4 percent four quarters after the peak, and in severe recessions to -7 percent. In a typical recession, consumption falls by close to 1 (8) percent during the first year of a typical (severe) recession. In terms of timing, the evolution of consumption around recessions resembles the behavior of output. Investment registers a much sharper decline in the first year than does output, and it takes longer to recover. Its growth rate typically stays negative for up to six quarters. In severe recessions, it can take up to three years for investment growth to recover.

Industrial production also typically registers a sharp decline during a recession following the time pattern of output, with in severe recessions, taking up to nearly three years for industrial to recover. Inflation tends to increase with the start of recessions, but the interval around the median behavior of inflation is rather wide reflecting the large variation in the dynamics of inflation across countries. Unemployment rate (note that the level is depicted) picks up with the start of recession and stays elevated for roughly five quarters.

Regarding trade, in a recession, the growth rate of exports slows but often stays positive (as the median number already suggested). Import growth, however, most often falls with the beginning of the recession and can decline to -10 percent in the first year of a recession. Both net exports and current account balances typically improve sharply in the first year of a recession consistent with the typical slowdown or reversal in capital inflows during recessions and financial crises in emerging markets.

Credit growth also slows down sharply when a recession starts and contracts by about 2 percent in the first year of a recession, much sharper than that typically observed in advanced countries. The growth rate of credit typically does not return to pre-recession growth rates for a number of quarters. In addition, recessions are often preceded by slowdowns in the growth rates of equity prices. In the first year of a typical recession, equity prices decline on a year-to-year basis by roughly 30 percent. However, there is also evidence that equity prices are forward looking as they often start registering positive growth after about six quarters in the recession, anticipating the recovery.

We also show the behavior of the other macroeconomic variables. In terms of government revenue, there is a slowdown, but not a large one. The picture is starker in terms of expenditures, where there is a sharper slowdown with government consumption declining for several quarters. As discussed in some earlier studies, this is quite different from the typical experience in advanced countries where there is an increase in government consumption during recessions, i.e., a countercyclical behavior (see Kaminsky, Reinhart and Vegh, 2004). It suggests that lack of

financing constraints governments in emerging markets from increasing expenditures during periods of recessions.

The charts on export and import prices display little movements, as the statistics in Table 1C already indicated, with little change in the terms of trade. There is much more movement in the exchange rate, with sharp declines in the nominal and still significant declines in the real effective exchange rates. The declines in the nominal rates are quite persistent, whereas the real exchange rate typically recovers after some 5 quarters. The temporal evolution of the short-term real interest rates suggests a pick up during the early stages of recessions, then followed by a decline.

These statistics confirm that recessions in emerging markets are much more devastating than those in advanced countries. In addition, the dynamics of adjustment around these episodes in emerging markets differ substantially from those in advanced countries. Figure 4 presents a comparison of the typical behavior (as well as the upper and lower quartiles) of some macroeconomic and financial variables during recessions in emerging markets and advanced countries. The typical decline in the year-over-year growth rate of output in emerging markets from peak to trough of a recession is three times larger than that in advanced countries (10 percentage points vs. 3 percentage points). In other words, emerging markets experience much deeper recessions than advanced countries do.

While consumption registers an outright drop in emerging markets during recessions, the year-over-year consumption growth stays positive in advanced countries. Both investment and industrial production also display much sharper declines in emerging markets relative to advanced countries. Inflation rate typically goes down in advanced countries whereas it increases somewhat in emerging markets during recessions. The rate of unemployment in both advanced and emerging countries go up during recessions, but the increase tends to be less stark in emerging markets.

There are also some differences in the behavior of trade and financial variables. In emerging markets, the growth rate of exports slows down sharply, but still stays above that of advanced countries. In contrast, the import sector goes through a much sharper adjustment in emerging markets than it does in advanced countries, and actually registers several quarters of negative growth. Both net exports and the current account correspondingly register much stronger improvements during recessions in emerging markets than in advanced countries, most often moving from a deficit to a surplus. Credit slows down in advanced countries during recessions, but it actually contracts in emerging markets. Finally, equity prices tend to exhibit a much sharper decline in emerging markets than advanced countries during recessions.

While almost all macroeconomic and financial variables thus exhibit much sharper adjustments in emerging markets than in advanced countries during recessions, the recovery trajectories of the same variables are also faster and stronger in emerging markets than in advanced countries.

In other words, the picture of a V-shaped recovery fits the emerging markets much better than the advanced countries. A full analysis of recoveries in emerging markets is, however, beyond this paper.

III.4. Synchronization of Recessions, Credit Contractions and Equity Price Declines

We next examine the synchronization of recessions, credit contractions and equity price declines across countries. Our synchronization measure is simply the fraction of countries experiencing the same event at about the same time. For recessions, Figure 5 shows this fraction over the period 1978:1-2011:4. The figure shows that recessions in emerging markets do occur in bunches. The first is the one related to the debt crisis of the 1980s, where the frequency of recessions increases, first in 1982 and then in the mid-1980s. Following this period, recessions are less common across countries up until the Asian crisis of 1998-1999. During that time, there is a relatively larger fraction of countries (about 40 percent) that suffered recessions. There is another increase coinciding with the 2001 U.S. recession, when a noticeable number of emerging markets are in recessions again.

If we define synchronized recessions as occurring when more than 35 percent of the emerging countries in our sample were experiencing recession, we identify synchronized recession episodes in the years 1982, 1985, 1998 and 2001. Table 1D shows that these synchronized recessions are significantly longer and more costly than other recessions are. Generally these recessions are a quarter longer, are more severe, and have cumulative output losses roughly two times greater, with all these differences statistically significant.

Part of the reason that these synchronized recessions are worse is because they occur when global demand is also weak. While typical recessions coincide with still some growth in exports, synchronized recessions witness a significant decline in the growth of exports (as well as larger declines in imports). Also export (and import) prices tend to decline during such recessions. Moreover, synchronized recessions are associated with more severe contractions in consumption, investment, and industrial production.

These episodes furthermore often result in greater job losses. And typical declines in equity prices and credit also tend to be much higher during synchronized recessions. Governments do not seem to be able to offset some of the declines in private demand; although government expenditures actually typically do not decline in such recessions. Financing constraints may play a role here: since government revenue declines sharply, increases in expenditure would have to be financed and especially in these types of recessions governments may be limited in their ability to raise funds.

We also consider the coincidence of financial markets contractions and the overlap with recessions (Figure 5). Equity prices exhibit the highest degree of synchronization, reflecting the extensive integration of stock markets. Often more than half of the emerging markets will

experience a sustained decline in equity prices. Credit contractions are somewhat less synchronized across countries, but still there are eight years in which more than 40% of countries experience credit contractions.

Recessions tend to most closely coincide with contractions in domestic credit in emerging market economies and somewhat less with declines in equity prices, as observed from the fractions of countries experiencing recessions being more highly correlated with the fractions suffering credit contractions than with those suffering bear equity markets. While credit contractions are particularly closely associated with recessions, we can not infer causality here—nor for any other relationship depicted here: credit could be declining because of the recession or a decline in credit could be leading to a recession.

III.5. Credit Contractions and Asset Price Declines

Next, we provide summary statistics about the episodes of credit contraction and equity price declines in emerging markets (Table 2). In terms of duration, episodes of credit contractions last longer than recessions do, some 7 quarters. Equity price declines last slightly shorter, but still with 6 quarters are longer than the typical recession. In terms of amplitude, a typical credit crunch is associated with a slightly more than 50 percent decline in credit while a credit contraction episode leads to about 12 percent decline. An episode of equity price decline (bust) tends to result in a 37 (70) percent fall in equity prices. Credit crunches and equity price busts not only have greater amplitudes—which is by definition, but they also last longer than other credit contractions and equity price declines do, 12 versus 5 quarters and 9 versus 5 quarters respectively.

Although the median duration of credit crunches in advanced countries is longer than that in emerging countries, crunches in advanced countries are much lighter than those in emerging markets. The periods of equity busts in advanced countries last as long as those in emerging markets, but they lead to smaller declines in equity valuations. Indicating the highly volatile nature of credit and equity markets in emerging economies, the slopes of credit contractions and equity price declines in these countries are much larger than those in advanced countries.

While episodes of credit contractions and equity price declines are typically not associated with a drop in output, they are associated with a slowdown in activity, especially when they take the forms of credit crunches. Both credit crunches and equity price busts appear to have adverse effects on the growth rate of investment: investment declines by 17 and 7 percent during credit crunches and equity busts, respectively, statistically significantly more so than during other credit contractions and equity price declines. These episodes are also associated with slight increases in unemployment. Compared to emerging markets, financial market disruptions in advanced countries are associated with less adverse outcomes in the real economy.

IV. RECESSIONS AND FINANCIAL MARKET DISRUPTIONS

IV.1. Leads and Lags Between Recessions, Crunches and Busts

We next study how closely recessions are related to credit crunches or busts in time. We first examine the typical lag between the start of a credit crunch or bust, and the beginning of the corresponding recession. If a recession is associated with a credit crunch, it typically starts roughly two quarters after the onset of the credit crunch and approximately three quarters after an equity price bust (Table 3). The variation is large, however, as the mean lead times for credit crunches or equity price busts are five quarters, much higher than the medians.

As we noted earlier, a typical credit crunch in emerging markets lasts more than 12 quarters and a typical equity price bust lasts about 10 quarters. In contrast, a typical emerging market recession is only four quarters long. Since credit crunches last much longer than recessions, to the extent they overlap, recessions tend to end six quarters before their corresponding credit crunch episodes end. Interestingly, in all but two cases, recessions ended before the end of their corresponding credit crunch episodes. These findings are clear reflections of the “creditless recovery” phenomenon observed in emerging markets (see Calvo, Izquierdo and Talvi, 2006). Equity price busts typically last as well beyond the end of their corresponding recessions, but only one quarter, or to put it differently, recessions end a quarter ahead of the corresponding equity price busts. The timing of recessions and financial market disruptions in emerging market economies are mostly similar to those in advanced countries, but there are also some differences.

IV. 2. Recessions Associated with Credit Crunches

We now study whether the coincidence of recessions and financial market disruptions affects the behavior of real sector and financial outcomes. We start with credit crunches. Table 4 presents the main features of recessions associated with and without credit crunches. To provide a sense of their distribution, we examine separately the features of recessions coinciding with severe credit crunches, i.e., the top 12.5 percent of all credit contractions (note that there are few of such events, only 7). The typical duration of a recession associated with a credit crunch exceeds that of a recession without a crunch by one quarter, but the difference is not significant. Typically, however, there is a significantly larger output decline during recessions associated with a credit crunch compared to other recessions, 8.5 versus 5 percent. Severe crunches coinciding with recessions have even larger declines in output, some 11 percent.

The cumulative output loss in recessions associated with (severe) crunches is typically larger than in recessions without crunches, with the difference for crunches statistically significant. Recessions with crunches are generally associated with significantly larger contractions in consumption, investment, and industrial production compared to recessions without crunches. These differences are generally even larger for recessions associated with severe crunches. The differences are economically also very large. While recessions associated with crunches result in a more than 9 percent consumption decline, those without such crunches lead to less than 1.5

percent contraction in consumption. And investment drops by some 30 percent in those recessions associated with crunches, some 18 percent more than in recessions without crunches.

Exports increase substantially more during recessions associated with credit crunches and the improvement in current account is also significantly larger. However, the differences between recessions associated with crunches and those without are not significant in the case of imports and net exports, even though these aggregates also exhibit sharper adjustments during episodes of the former category. The increase in the rate of inflation is significantly larger during recessions associated with severe credit crunches than during recessions with no credit contractions, but inflation actually decreases more during recessions associated with credit crunches than during recessions with no credit contractions.

Credit, by construction, registers a much larger (and statistically significant) decline in recessions with crunches than in those without. In contrast, while equity prices also decrease more in recessions with crunches, the difference in equity price declines between recessions with crunches and those without is not statistically significant.

IV.3. Recessions Associated with Equity Price Busts

There are a number of statistically significant differences between recessions coinciding with equity price busts and those without (Table 5). While differences are not noticeable in duration, they are in some other aspects of recessions. In particular, declines in output (and corresponding cumulative losses) are typically much greater in recessions with busts, -6.8 (-14) percent versus -3.3 (-4.6) percent without busts. These sizeable differences extend to other variables.

For example, there is a significantly larger decline in consumption in recessions associated with equity price busts. Investment falls substantially more during recessions coinciding with equity price busts, but the decline in industrial production is not significantly different. And unemployment rises more during recessions coinciding with equity price busts than during other recessions. These results are quite different than those recessions accompanied with equity busts in advanced countries where such events are associated with only moderate changes in economic activity.

In terms of trade variables, there are considerable differences between recessions coinciding with equity price busts and other types of recessions, in part reflecting the substantial decline in domestic demand and, thus, imports. Along with stale exports, both net exports and current account balances improve significantly more in recessions with equity price busts. With respect to financial outcomes, by construction, equity prices fall much more in recessions with equity busts (by roughly 20 percent more), but credit also contracts more (by some 6 percent more), with both differences significant.

IV. 4. Recessions Associated with Financial Crises

We lastly also explore how financial crises interact with recessions as many have pointed out the severe impacts of financial crises on the real economy.¹⁸ Using the crisis dates compiled by Laeven and Valencia (2008), we consider a recession episode associated with a crisis when the recession begins at the same time or after the start of an ongoing crisis. We find 20 recession episodes associated with financial crises and 10 severe recession episodes associated with financial crises.

When we examine the implications of recessions associated with a financial crisis (Table 6), we find that the average duration of a recession associated with a financial crisis exceeds that without a financial crisis, by only a quarter. There is typically a much larger output decline in recessions associated with crises compared to other recessions, -8.3 versus -4.3 percent. The cumulative output losses in (severe) recessions associated with financial crises are typically also larger compared to those without crises, by roughly two (four) times.

Recessions with crises tend to be associated with significantly sharper declines in consumption, investment, imports, and industrial production, compared to recessions without crises. Exports increase more during recessions associated with crises (although not significantly so) and, given the large decline in imports, the improvement in net exports is significantly larger. Correspondingly, the current account balance registers substantial improvements during recessions coinciding with crises. The increase in the rate of unemployment is larger during recessions associated with crises, but the difference across episodes is not significant. Both credit and equity prices register much larger and significant declines in recessions with crises, especially for the severe recessions in our sample.

IV.5. Recessions Associated with Crunches, Busts and Crises: A Comparison

When associated with a (severe) credit crunch, equity price bust, or financial crisis, which type of recession is the most painful? With respect to their mean duration, they are quite close, that is, recessions with financial crises are generally as long as those associated with credit crunches and equity price busts. When measuring the cost of the recession, however, the answer varies and depends in part on the metric used (Table 7). If we use amplitude as the metric, then recessions

¹⁸ Reinhart and Rogoff (2008, 2009) examine the parallels between the 2007-2008 crisis and earlier banking crises. Their sample includes the “big five” advanced economy banking crises (Spain, 1977; Norway, 1987; Finland, 1991; Sweden, 1991; and Japan, 1992), a number of well-known emerging market episodes, and the Great Depression. They point to the strong similarities between the 2007-08 advanced countries’ crisis and these major historical episodes. Since our focus is on recessions rather than financial crises, we do not conduct a study of the effects of financial crises per se, but rather what happens when financial crises coincide with recession, where we leave the causality question aside. The dating of a financial crisis is more subjective than the dating we apply to recessions and asset price declines, which makes comparison across studies more difficult.

associated with credit crunches appear to be more costly than recessions with equity price busts, while recessions associated with financial crises are about as costly. However, if we use the cumulative loss measure as the metric, then recessions associated with equity busts are slightly more costly than those associated with credit crunches (-13.52 vs. -11.12 percent). And the cumulative losses in the recessions associated with crises are typically larger than those in recessions associated with either credit crunches or equity price busts. These differences are even starker for the recessions associated with severe credit crunches or equity price busts, or the severe recessions associated with financial crises.

Why do recessions that coincide with credit crunches or financial crises result in larger cumulative losses than those with equity busts? For one, investment and consumption, usually register much sharper declines during recessions coinciding with credit crunches or financial crises. In particular, the typical decline in consumption during recessions associated with crunches or financial crises is more than two times larger than that during recessions coinciding with equity busts. The larger decline in consumption likely reflects the adverse effects of the sharp contraction in credit on consumption and investment. Moreover, recessions with credit crunches lead to more pronounced drops in employment.

Recessions associated with equity price busts are much more costly events for emerging markets than for advanced countries. Claessens, Kose, and Terrones (2009) report that while recessions associated with equity price busts tend to be longer and deeper than those without equity busts in advanced countries, many of the differences are not statistically significant. This is unlike the results we report for emerging markets. This might reflect the fact that the link between equity price busts and developments in the real economy in advanced countries is weaker compared to that of credit crunches. In emerging market economies, gyrations in equity markets are often associated with large swings in the direction and volume of capital flows, which would imply that recessions associated with equity price busts probably coincide with severe disruptions in balance of payments as well.

We also study the implications of recessions accompanied by a credit crunch, an equity price bust or financial crisis simultaneously. Although the number of observations for such cases is small, these recessions often involve larger cumulative output losses than those accompanied with only a crunch or a bust.¹⁹ For example, the median cumulative loss from the six recessions associated with both a credit crunch and an equity price bust is around 17 percent. Recessions

¹⁹ There are 5 recessions associated with both a credit crunch and an equity price bust. There are only 4 recessions in our sample that are accompanied by both a credit crunch and a financial crisis. While these cases are also associated with larger cumulative output losses, they are not significantly different from the others we examined. We also investigate the implications of recessions associated with different combinations of severe credit contraction/crunch/financial crisis and asset price decline/bust/financial crisis episodes. The results are similar to those reported, that recessions accompanied by more severe financial market difficulties are generally worse.

associated with both a financial crisis and an equity price bust result in around 24 percent cumulative loss in output.

V. POLICY RESPONSES DURING RECESSIONS, CRUNCHES AND BUSTS

As noted, the “policy” variables we focus on are (real) government consumption as a proxy for fiscal policy and short-term interest rates as a proxy for monetary policy. Although we are aware of the problems involved in associating these variables to the rather broad concepts of fiscal and monetary policy, in our view, these data are illustrative of some general patterns across different types of recessions. Table 8 summarizes the medians for peak-to-trough changes in the policy variables for our different combinations of events.²⁰ Significance tests are performed on the differences between the means in the various subgroupings, e.g., between severe recessions and other recessions (note that these tests, like the other ones, do not compare the policy stance during the events with the stances in normal times, but rather compare stances among events).

Policy responses vary across types and severity of events. While most differences in policy responses are intuitively appealing, they are not statistically significant in most cases. Monetary policies tend to be countercyclical during recessions and credit contractions, in that interest rates are generally lower in nominal, and especially in real terms, compared to normal times. The larger decline in the real interest rate compared to in the nominal interest rate suggests, however, that it is the increase in inflation that causes this pattern. Monetary policy, again measured by changes in the short-term real interest rate, appears to be more accommodating in severe recessions, and equity price busts. This is especially so in credit crunches where real rates are some 7 percentage points lower and nominal rates some 2 percentage points.

When considering recession episodes also involving credit crunches, equity price busts or financial crises, the declines in interest rates are larger than in recessions without such events, by some 2 to 4 percentage points in real terms and by up to ½ a percentage points in nominal terms. In other words, a more aggressive countercyclical monetary policy is at work in recessions with credit crunches, possibly because monetary policy is less effective in these circumstances. Again, caution in interpreting this as an indication of monetary policy is needed since the decline is larger in real than in nominal terms.

Fiscal policy appears to be somewhat procyclical in recessions but countercyclical during credit contractions and equity price busts. This procyclicality is especially strong during severe recessions when the drop in government consumption compared to normal times is some 7 percent. In the severe cases of financial disruptions, however, government expenditures still rises by some 1 to 7 percent, the latter in case of an equity price bust. This could be due to the much longer duration of these financial market disruptions (data are peak-to-trough changes).

²⁰ Our preliminary results suggest that alternative measures of fiscal and monetary policies, including government revenue and money supply, show patterns broadly consistent with those of the benchmark measures we use here.

With respect to recessionary episodes coinciding with (severe) crunches and busts, differences in policy responses, although mostly also not statistically significant, are somewhat counterintuitive. During recessions associated with credit crunches, the decline in government consumption is larger relative to other recessions. A similar pattern is observed during recessions associated with severe equity prices busts. However, these differences are not significant. The only difference that is significant is the change in government consumption during recessions with severe credit crunches, when the growth rate decreases by some 9 percent compared to normal times, much more than that in recessions without credit crunches. And during recessions overlapping with financial crises, there is a decline of about 4 percent.

These comparisons suggest that the lack of increase or actually decline in government expenditures during recessions coinciding with periods of financial turmoil is due to the financing constraints governments in emerging markets face in such periods. In other words, while governments in emerging markets typically run somewhat countercyclical policy during periods of credit contractions and equity price declines, when recessions overlap with periods of financial stress, notably severe credit crunches, they are not able to do so.

VI. DETERMINANTS OF COSTS OF RECESSIONS

In previous sections we have examined how recessions associated with credit crunches and equity price busts in emerging economies are different from those without such financial market disruptions. Next, we turn to a preliminary analysis of the empirical links between output losses and changes in financial market conditions during these episodes. In particular, we employ basic regression models to examine how the amplitude of a recession is associated with changes in financial variables during recessions, considering at the same time domestic and global economic conditions. This exercise deepens our analysis of the earlier sections as it provides some insights about the roles played by financial factors influencing the severity of recessions, while at the same considering other variables. We indeed find a positive relationship between the amplitude of a recessions and the changes in credit or equity prices during recessions (Table 9).

Of course, there is number of distinct factors that can affect the recession outcomes. However, based on the findings in the previous sections and earlier literature²¹, we focus on a set of

²¹ Our objective here is *not* to analyze the sources of business cycles, but is simply to correlate some financial factors to the cost of recessions. The sources of business cycles have traditionally been a topic of intense discussion (see, for instance, Zarnowitz (1985, 1998); Blanchard, 1993; Blanchard and Watson, 1984; Cochrane, 1994; Stock and Watson, 1999; and Romer, 1999). While some economists argue that cycles are originated by changes in demand or supply conditions, others emphasize the importance of shocks stemming from economic policies. Some others claim that the main sources of business cycles are productivity shocks (Kydland and Edward, 1982; Plosser, 1989). In recent work, Crucini, Kose and Otrok (2008) examine the roles played by various shocks, including to productivity, fiscal policy, monetary policy, terms of trade and oil, in explaining international business cycles.

selected variables. Indeed, our analysis in the previous sections suggests that changes in financial variables, particularly credit, are important in determining recession outcomes as recessions associated with credit crunches are more costly than those without such episodes. In order to examine the role of credit, we include as a regressor the change in credit during recessions.

In addition to this financial variable, we analyze how general economic conditions prevailing at the onset of recessions are associated with recession outcomes. As a simple proxy for the state of the domestic economy, we use the cumulative growth of output over the two years preceding the recession. This variable allows us to examine whether the strength of the expansionary phase of the cycle plays any role in determining the depth of the ensuing recession. We also control for global economic conditions with a variable capturing the strength of external demand. In particular, we include in the regressions the changes in a country's terms of trade during recessions since favorable movements in the terms of trade can be a buffer to downturns in domestic demand in these economies. We also explore the extent movements in the real exchange rate has helped these economies offset the effects of external shocks. We also examine whether trade openness have any association with the severity of recessions in EMEs. More open economies can export their way out of a recession, particularly when the main source of it is domestic.²² As we presented in earlier sections, recessions associated with financial crises tend to be more severe. We also control for this possibility by including a financial crisis dummy.

We then regress the amplitude of recessions on these financial variables, initial conditions, and other controls, using a large sample of recessions over the period 1978:1-2011:4. Table 10 reports the results of our baseline OLS regressions. As in the simple bivariate case, the coefficients on credit are positive and statistically significant implying that the sharp declines in credit are associated with deeper recessions.

Why do changes in credit appear to be important in determining the costs of recessions in emerging market economies? Some insights on this question can be gained through mechanically examining changes in the main components of output during recessions associated with credit crunches. In the earlier sections, we reported that consumption and investment usually register much sharper declines leading to more pronounced drops in employment during recessions coinciding with credit crunches. In particular, the decline in investment during recessions associated with credit crunches is larger, likely reflecting firm's dependence on bank lending to finance their working capital. In some economies, working capital reaches up to 60 percent of bank loans. Firm-level data also suggests that firm leverage, profitability and measures of financial costs are affected by the credit cycle (see, Mendoza and Terrones, 2008).

²² As we mentioned earlier, we are in the process of putting together a database of international financial flows, including foreign direct investment flows, portfolio and debt flows, and reserves, for these countries. We plan to extend our regression analysis including these variables in the next version.

In addition to the changes in credit, some other factors also appear to influence the cost of recessions. For example, the state of the economy is positively associated with the extent of decline in output during recessions. This is an intuitively appealing result as it suggests that the higher the growth during the expansionary phase of the cycle, the larger the contraction during the recessionary phase. In addition, there is some evidence that suggests that countries more open to trade in goods and services tend to suffer milder recessions as their access to more elastic markets for their production allows them to offset the effects of a drop in domestic demand.

Neither the changes in a country's terms of trade nor in its real exchange rate appear to be associated with the amplitude of recessions in a statistically significant way. Lastly, the presence of a financial crisis does not seem to have a statistically significant effect on the depth of recessions. One interpretation of the latter result is that the changes in credit already capture the effect of financial crises in our simple regressions, but as we discuss below this may not be a robust explanation as the result changes in some specifications. As one would expect, the amplitude of a recession is positively associated with its duration. In summary, across the different specifications we employ, the change in credit is significantly associated with the depth of recessions. Among the other control variables we use, the state of the economy at the onset of the recession and the duration of the recession tend to influence most consistently the extent of the decline in output during recessions.

We next examine the robustness of these findings to the inclusion of fixed effects to control for country-specific and time invariant characteristics omitted in our basic model.²³ Table 11 reports the results of these regressions. Reassuringly, our main findings are preserved. In particular, the changes in credit remain significantly positively correlated with the costs of recessions. Our findings with respect to the other controls are also consistent with the ones reported earlier; however, the coefficient on the crisis dummy becomes positive and statistically significant, suggesting that there is a positive association between the presence of financial crises and the cost of recessions. This result echoes the findings by Bordo, et al. (2001) who report that banking, currency and twin crises are positively correlated with the severity of recessions (see also Cerra and Saxena, 2008). Interestingly the association between trade openness and the cost of recessions is no longer significant, suggesting that openness was perhaps picking up the effects of other country-specific characteristics not included in the basic model.

VII. CONCLUSION

This paper provides a comprehensive analysis of the dynamics of recessions and financial market disruptions for 24 emerging markets using quarterly data during 1978:1-2008:4, thereby filling

²³ We also examine whether our results are driven by outliers. For this purpose, we simply use the quantile regressions, a widely used methodology to control for the impact of outliers. We find that our main findings remain unchanged; however, some specifications that include duration as control, credit is not longer significant.

several gaps in the literature. In particular, it is the first to study the features of episodes of recessions, credit crunches, equity price busts and financial crises in terms of a sizeable set of macroeconomic and financial variables for a large number of emerging market countries over a long period. It provides an examination of how these episodes in emerging markets coincide around the globe and how monetary and fiscal policies vary by combination of these events. It is also the first to analyze the implications of recessions coinciding with certain types of financial market disruptions for emerging markets, and how these recessions and financial market disruptions differ from those in advanced countries. Finally, it analyzes the determinants of the cost of recessions, and the importance of various factors in explaining the depth and violence of such episodes in emerging markets.

The analysis shows that recessions in emerging markets are more severe than those in advanced countries, with greater declines and larger (cumulative) losses in output. As for advanced countries, globally synchronized recessions are more costly for emerging markets than other recessions are. Financial market disruptions are about as common in emerging markets as in advanced countries, but tend to be deeper and more protracted, in part as they often involve a financial crisis as well. Policy makers in emerging markets appear more constrained in responding to recessions than those in advanced countries, especially in terms of fiscal policy, likely as governments face external financing constraints. Monetary policy ends up being accommodative, but largely due to inflation surprises.

Interactions between macroeconomic and financial variables play major roles in determining the severity and duration of recessions in emerging markets. Specifically, recessions associated with financial disruption episodes tend to be deeper and longer than other recessions are. In particular, recessions associated with credit crunches appear to be more costly than recessions with equity price busts in terms amplitude, while recessions associated with financial crises are about as costly.

We analyzed more formally the special role of financial market conditions in affecting the depth of recessions in emerging markets. Our results suggest that changes in credit tend to be the financial variable most strongly associated with the depth of a recession. In terms of other factors, decline in output is influenced most strongly by the duration of the recession, existence of a financial crisis, and also by the state of the economy at the onset of the recession.

Our analysis provides many insights on how macroeconomic and financial variables interact around episodes of business and financial cycles, and on the global dimensions of recessions and financial cycles in emerging markets. Our analysis also shows how several factors and policies can shape the nature of a recession in a particular emerging market country. In showing this, our analysis highlights a number of (long standing) questions and policy issues. Many of these have been studied for some time and in many places. We therefore review the implications of our work only in terms of two aspects: policy approaches for addressing recessions, and lessons in terms of global coordination.

In terms of policy approaches and focusing on macroeconomic policy,²⁴ our analysis suggests that governments in emerging markets face more constraints adopting more accommodative fiscal and monetary policies in times of recessions or turmoil than advanced countries do. The analysis suggests limits to using fiscal policies in emerging markets because of financing constraints, likely due to high existing public debt burdens and cutoffs from foreign and domestic financing. Monetary policy's effectiveness seems to be confounded by large increases in inflation, possibly triggered by the typical sharp exchange rate changes and aggravated by lack of credibility due to weak institutional frameworks. These limitations may explain why recessions, especially those combined with financial turmoil, are more severe in emerging markets than those in advanced countries. It points towards the need to make improvements in domestic institutional infrastructures and international financial architectures to allow for more flexible policy responses.

Our finding of large synchronicity in recessions and financial turmoil in emerging markets confirms the need for reforms to the global architecture. It suggests that these episodes and their severity can be due to common factors and cross-border spillovers. Since globally synchronized recessions in emerging markets tend to be worse, global approaches to addressing recessions can be useful. Reforms will have to be of both the ex-ante and ex-post type, that is, reforms to help prevent the occurrence of recessions and financial turmoil, and reforms to help deal better with the aftermath in the contracting phase. Globally, the need to reduce the build-up of risks in the expansionary phase of the cycle is now well recognized. For emerging markets, reforms to improve ex-ante insurance mechanisms and the availability of ex-post external financing are likely particularly important. Structural reforms of specific value to emerging markets include correcting weaknesses in cross-border banking resolution as these can help prevent spillovers to occur.

While our broad cross-country study sheds much new light on the implications of recessions, crunches, busts, and financial crises in emerging markets, it does come with its caveats. Being primarily an event study, no causal inferences are made (or intended) as to how recessions come about, whether financial variables affect macroeconomic outcomes or vice-versa, and how policies affect economic and financial outcomes. Moreover, an important caveat to our analysis is that initial conditions, external developments in terms of both demand and supply, and policy responses will affect the path an economy follows during a recession. While we attempted to control for some of these factors in our preliminary regressions, nevertheless our analysis makes clear that more work is needed so as to be better informed on how to adjust policies and institutional environments to lower the costs of recessions.

²⁴ Policy measures employed by governments to address recessions and periods of financial turmoil typically involve not just a mixture of monetary and fiscal policy responses, but also various forms of financial sector support. Furthermore, support may be provided to those directly affected by the recessions and financial turmoil, such as through trade finance, small business finance, and loans to specific sectors. The costs and benefits of these various policy interventions cannot be answered from our analysis alone—for many it would require a more micro-based analysis of the specific plans and a comparison to past experiences with such interventions.

Importantly, our analysis does not yet explore the channels through which financial and real variables interact. As noted by a diverse set of theoretical studies, besides general wealth and substitution effects, financial variables will impact the balance sheets of financial institutions, firms and households, and thereby affect the extension of credit and thus the performance of the real economy. While there has been some empirical work documenting the importance of these channels in normal times and financial crises, especially in the context of emerging markets, little is known about how these channels operate in recessions.

There are a number of issues to be explored in future research. One additional approach to shed more light on the channels would be to use individual firm data for a large sample of countries. For instance, one can examine the evolution of firm financial variables, especially credit use, inventory and liquidity, by classes of firms, including firm size, degree of leverage, foreign funding, and other measures capturing the likely degree of firms being financially constrained. This could allow one to investigate whether firms that are more dependent on external finance are hit harder during recessions with credit contractions and equity busts than during normal recessions. Another avenue for future research is to use alternative metrics of economic activity, such as various measures of output gap, studying whether there are different patterns in recessions associated with financial disruption episodes, and how various types of recessions interact with cycles.

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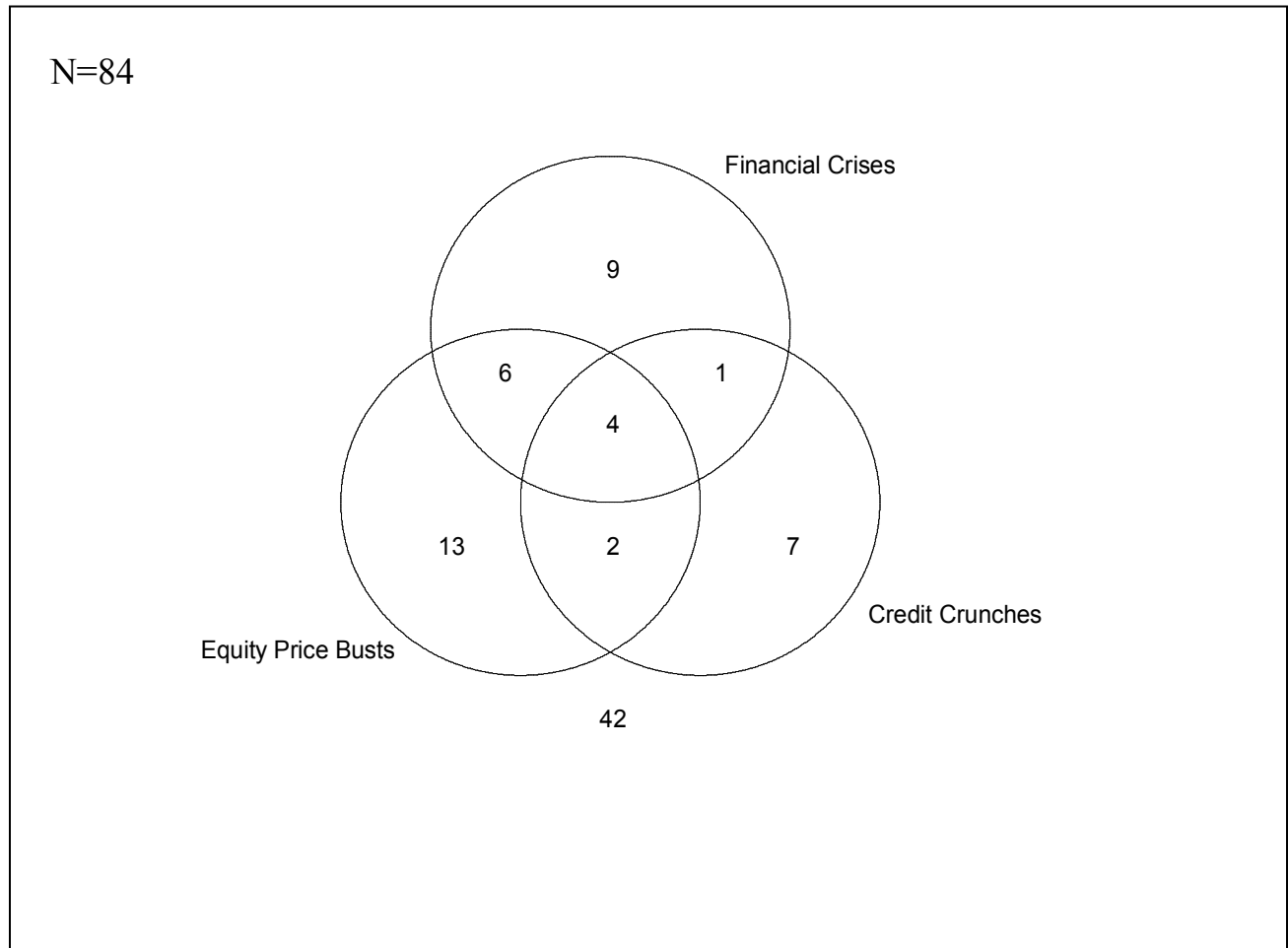
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APPENDIX I

[TO BE INCLUDED]

PLEASE NOTE THAT THE RESULTS HERE REFER TO A SUB-SAMPLE OF OUR DATABASE (1978-2007). WE ARE IN THE PROCESS OF GENERATING THE RESULTS FOR THE LONGER DATABASE (1978-2013) WE HAVE PUT TOGETHER RECENTLY. THE RESULTS FROM THE LATEST DATABASE WILL BE PRESENTED IN THE CONFERENCE VERSION OF OUR PAPER.

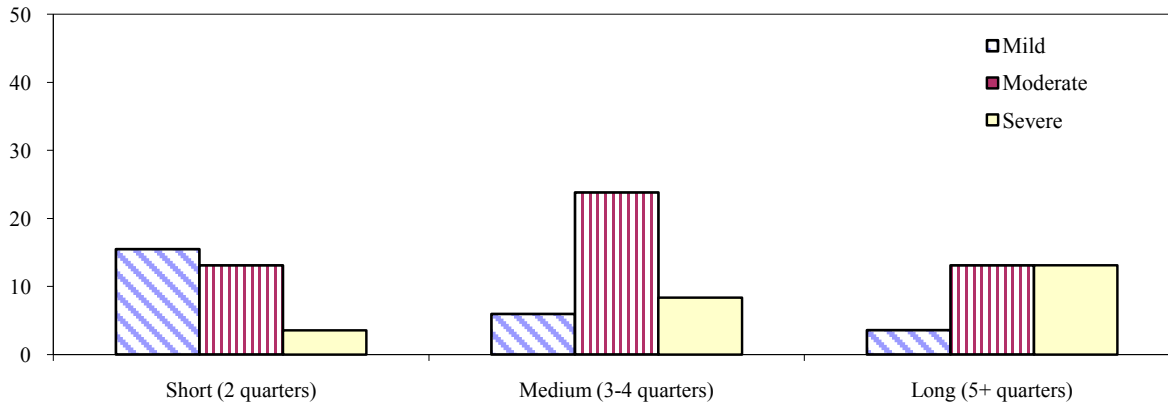
Figure 1. Associations between Recessions, and Financial Disruptions
(Number of events in each event category)



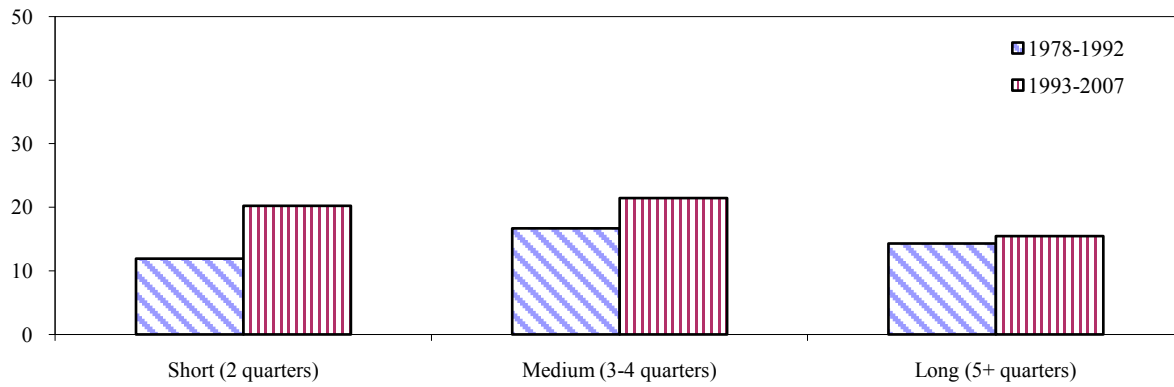
Notes: The rectangle shows the distribution of 84 recession episodes into those associated with crisis, busts and crunches (42) and those associated with none (42). Out of 84 recessions, 14 are associated with credit crunches, 25 are with equity price busts, and 20 are with financial crises. 42 recessions are associated with neither a crunch nor bust episode.

Figure 2. Recessions: Duration and Amplitude
(in percent of total number of recessions)

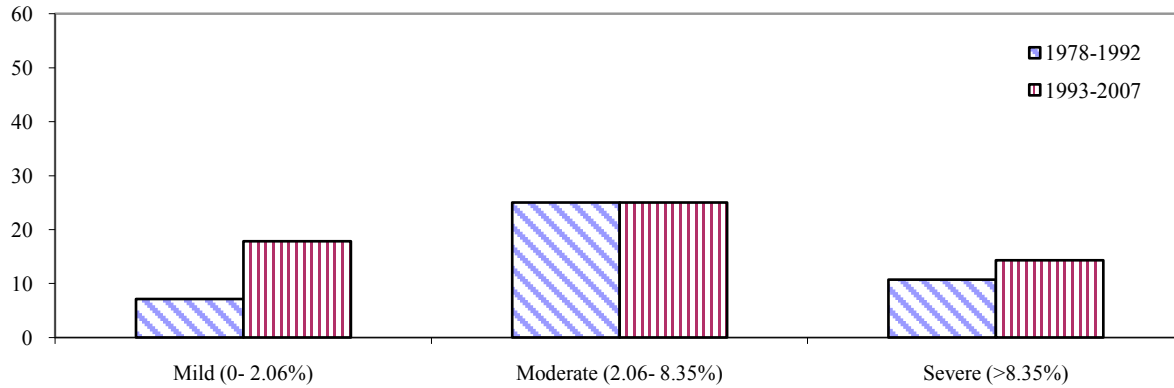
a. Duration and Amplitude: Full Period (1978:1-2007:4)



b. Duration: Sub-periods



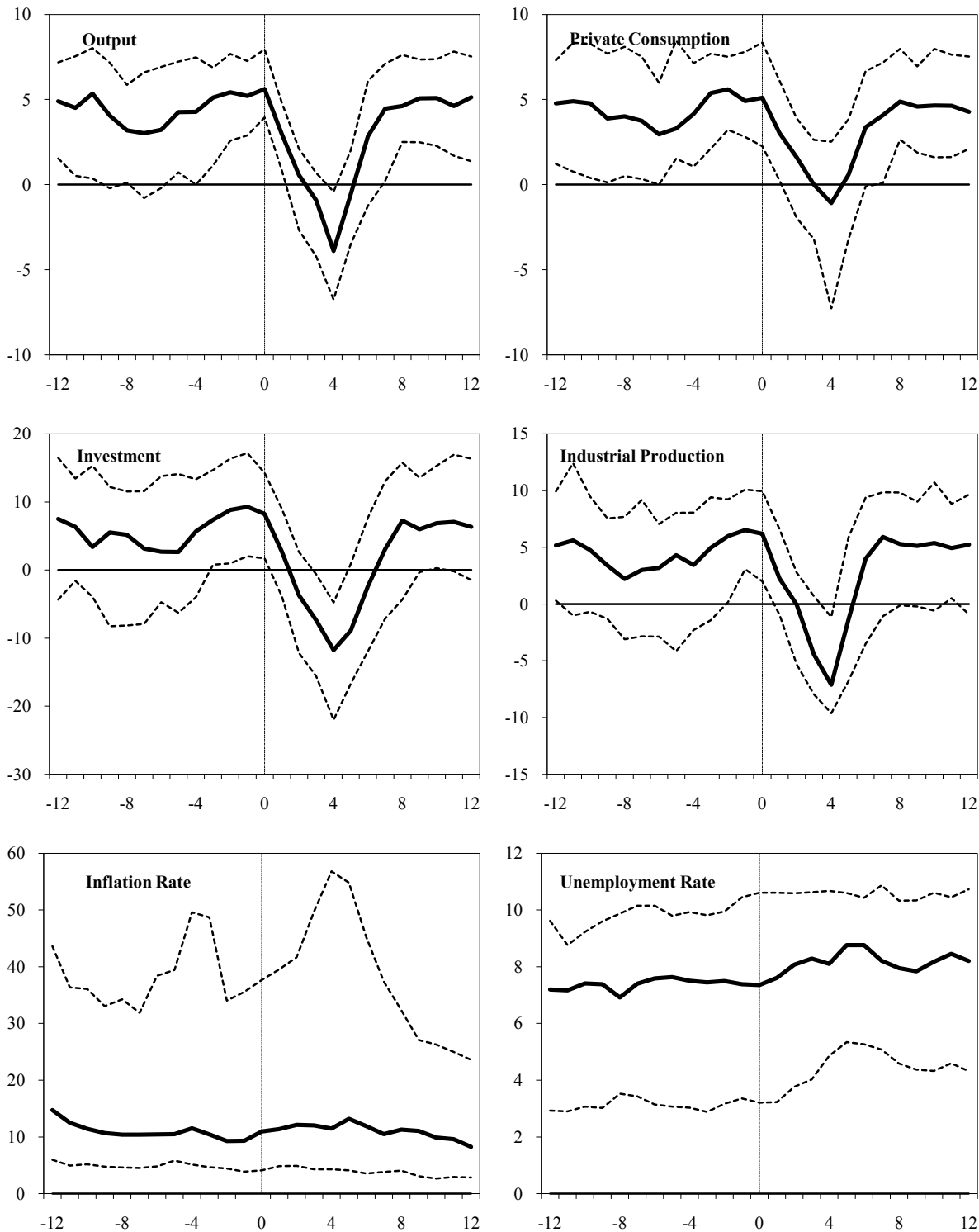
c. Amplitude: Sub-periods



Notes: Share of total number of recessions falling in particular categories. Duration is the number of quarters from a peak to the next trough of a recession. Amplitude is the percent change in output from a peak to the next trough of a recession.

Figure 3. Dynamics of Recessions: Emerging Markets

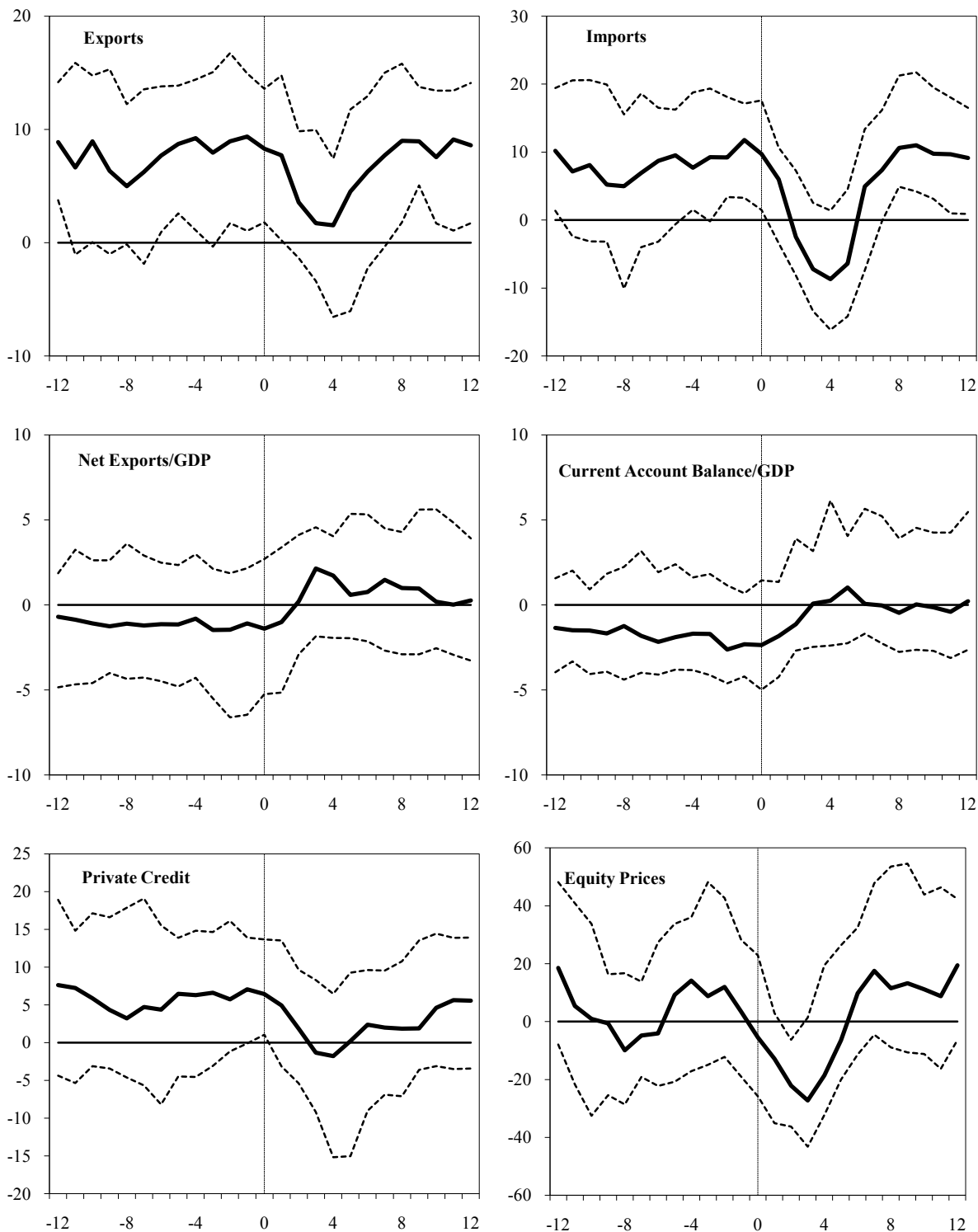
(percentage change from a year earlier unless otherwise noted; zero denotes peak; x-axis in quarters)



Notes: The solid line denotes the median of all observations while the dotted lines correspond to the upper and lower quartiles. Zero is the quarter after which a recession begins (peak in the level of output). Inflation rate, unemployment rate, net exports/GDP, and current account balance are the levels of the respective variables in percentages.

Figure 3. Dynamics of Recessions: Emerging Markets

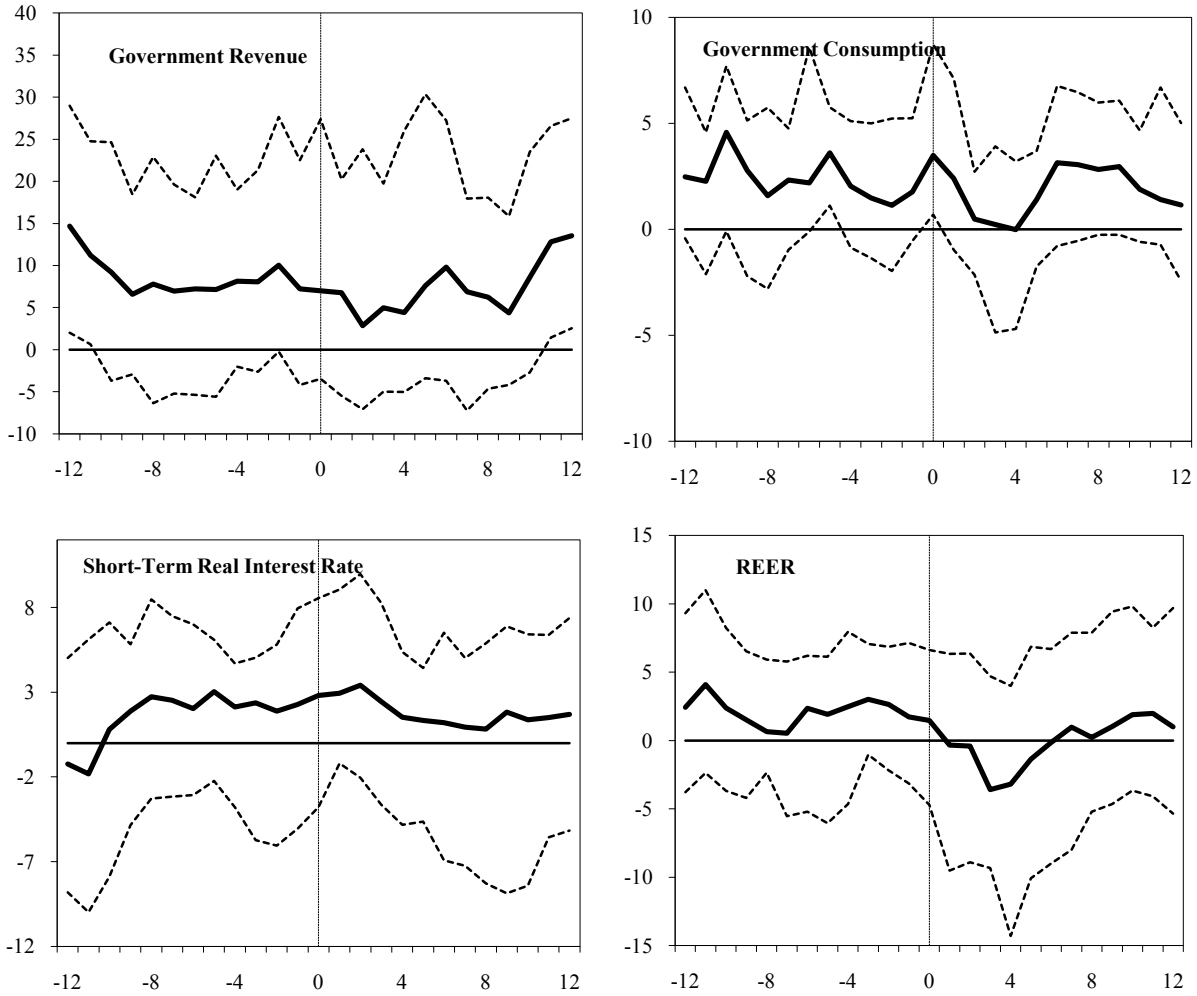
(percentage change from a year earlier unless otherwise noted; zero denotes peak; x-axis in quarters)



Notes: The solid line denotes the median of all observations while the dotted lines correspond to the upper and lower quartiles. Zero is the quarter after which a recession begins (peak in the level of output). Inflation rate, unemployment rate, net exports/GDP, and current account balance are the levels of the respective variables in percentages.

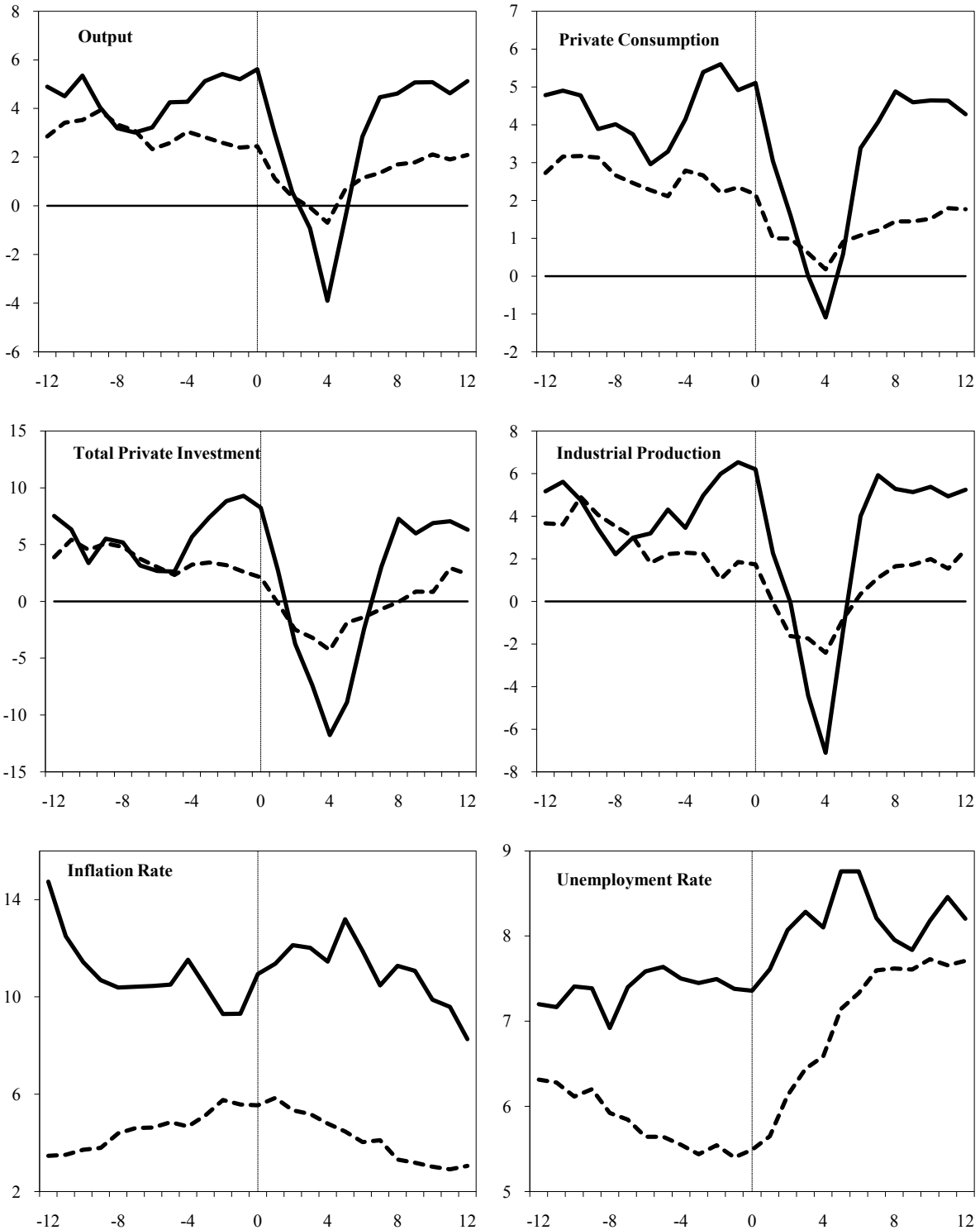
Figure 3. Dynamics of Recessions: Emerging Markets

(percentage change from a year earlier unless otherwise noted; zero denotes peak; x-axis in quarters)



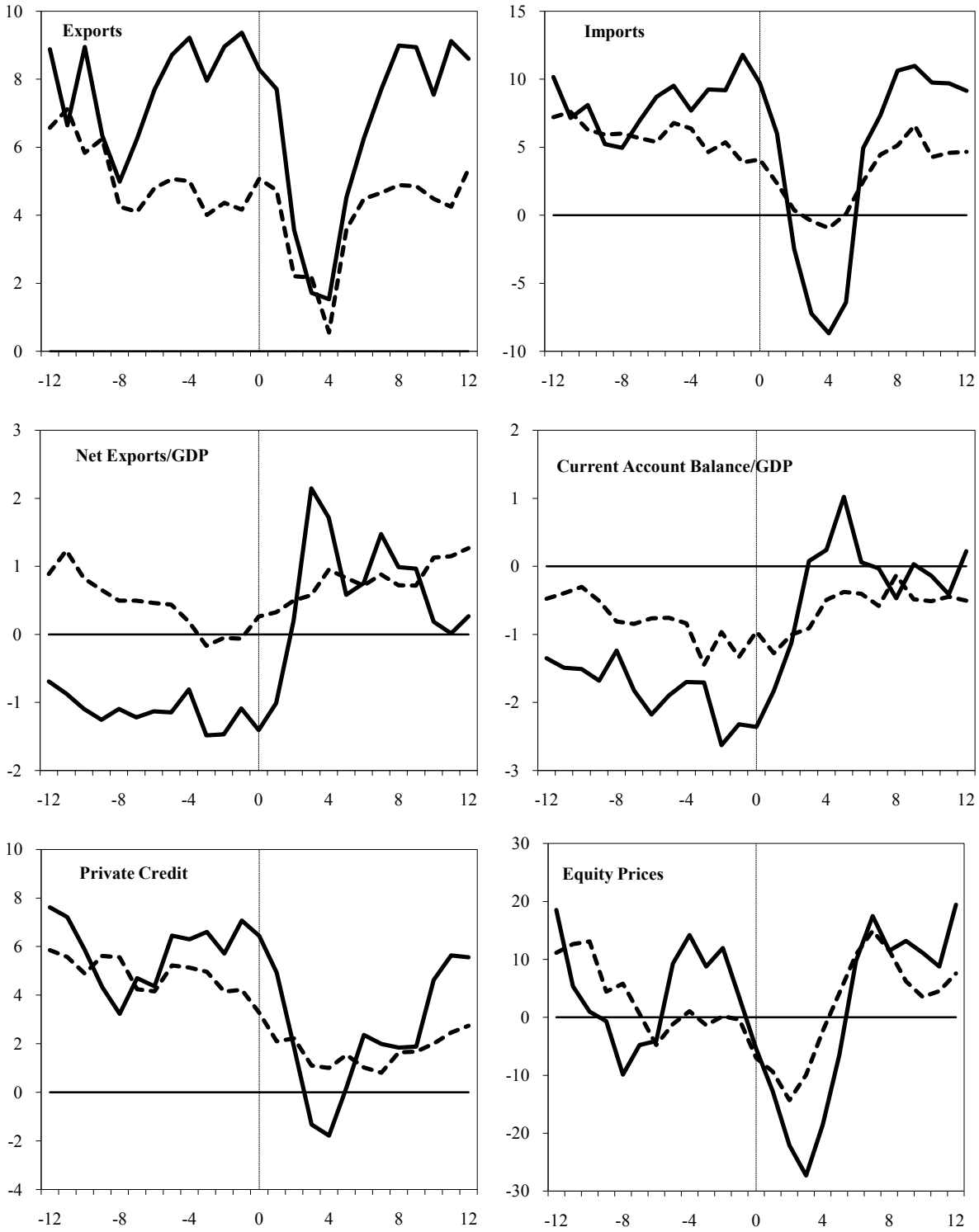
Notes: The solid line denotes the median of all observations while the dotted lines correspond to the upper and lower quartiles. Zero is the quarter after which a recession begins (peak in the level of output). Inflation rate, unemployment rate, net exports/GDP, and current account balance are the levels of the respective variables in percentages.

Figure 4. Dynamics of Recessions: Emerging Markets and Advanced Countries
(percentage change from a year earlier unless otherwise noted; zero denotes peak; x-axis in quarters)



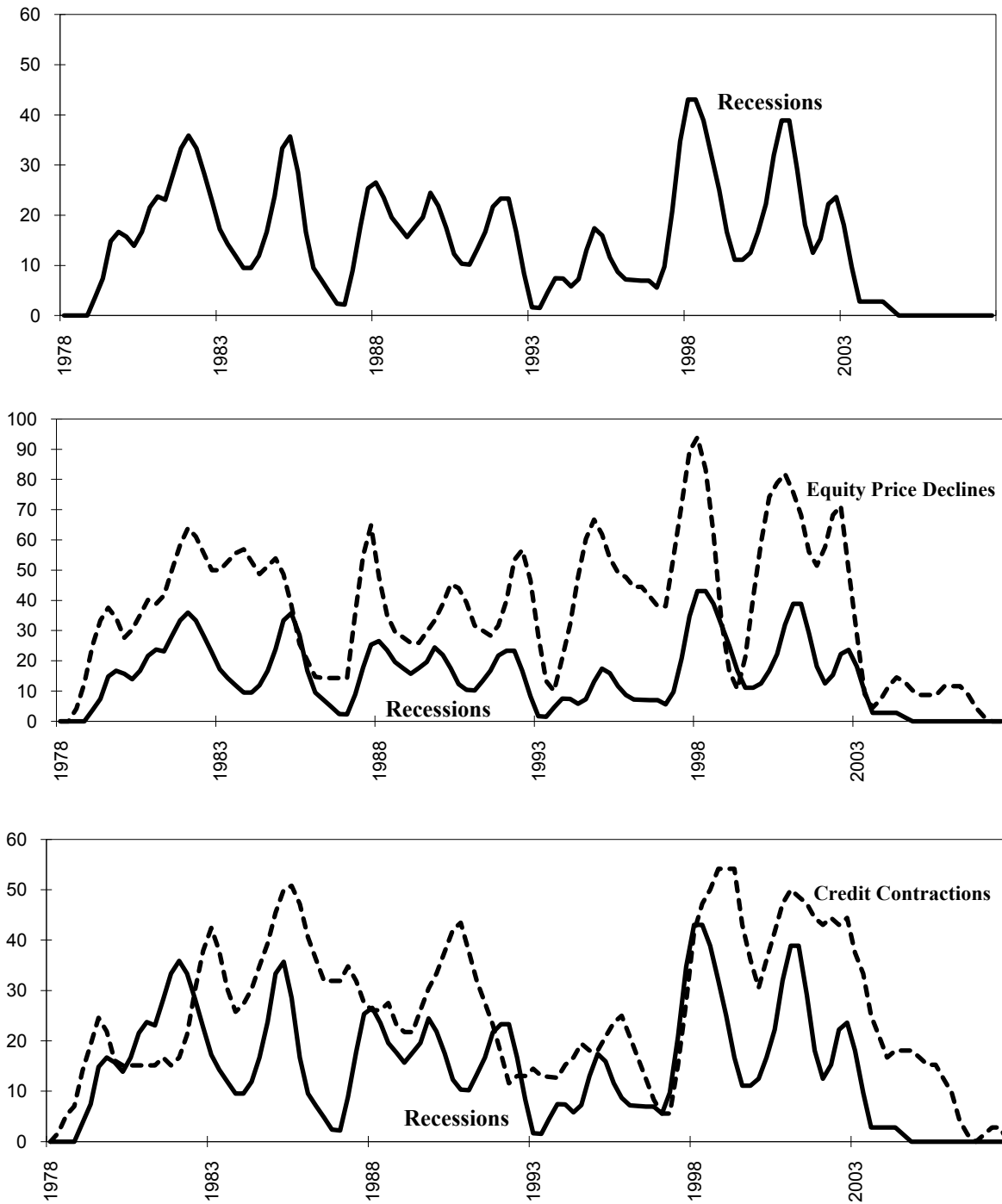
Notes: The solid line denotes the median of all observations of emerging countries while the dotted line correspond to the median of all observations of advanced countries. Zero is the quarter after which a recession begins (peak in the level of output). Inflation rate, unemployment rate, net exports/GDP, and current account balance are the levels of the respective variables in percentages.

Figure 4. Dynamics of Recessions: Emerging Markets and Advanced Countries
(percentage change from a year earlier unless otherwise noted; zero denotes peak; x-axis in quarters)



Notes: The solid line denotes the median of all observations of emerging countries while the dotted line correspond to the median of all observations of advanced countries. Zero is the quarter after which a recession begins (peak in the level of output). Inflation rate, unemployment rate, net exports/GDP, and current account balance are the levels of the respective variables in percentages.

Figure 5. Synchronization of Recessions, Credit Contractions and Equity Price Declines
(1978:1-2007:4, in percent)



Notes: Share of countries experiencing recessions, episodes of credit contractions and /or equity price declines.

Table 1A. Recessions in Emerging Markets: Basic Features

Country	All Recessions						Severe Recessions				
	Number of Recessions	Duration	Proportion of time in Recession	Amplitude	Slope	Cumulative Loss	Number of Severe Recessions	Duration	Amplitude	Slope	Cumulative Loss
Asia											
China											
Hong Kong	6.00	2.83	0.14	-3.01	-0.98	-5.87	1.00	5.00	-8.84	-1.77	-27.16
India											
Indonesia	2.00	3.50	0.07	-9.16	-1.90	-26.09	1.00	5.00	-17.85	-3.57	-51.64
Korea	2.00	3.50	0.06	-5.56	-1.76	-8.89	1.00	3.00	-8.87	-2.96	-13.56
Malaysia	2.00	2.50	0.06	-6.18	-2.16	-11.73	1.00	3.00	-11.16	-3.72	-21.70
Philippines	4.00	5.00	0.19	-5.84	-1.05	-24.69	1.00	9.00	-17.14	-1.90	-86.23
Singapore	4.00	3.50	0.12	-4.39	-1.33	-8.06					
Taiwan	2.00	3.00	0.05	-2.68	-0.79	-4.77					
Thailand	1.00	8.00	0.13	-15.13	-1.89	-49.31	1.00	8.00	-15.13	-1.89	-49.31
Latin America											
Argentina	8.00	4.50	0.30	-8.81	-2.13	-22.70	4.00	4.50	-12.83	-3.10	-31.54
Bolivia											
Brazil	9.00	3.11	0.25	-4.46	-1.48	-6.38	1.00	3.00	-11.15	-3.72	-9.78
Chile	3.00	3.33	0.09	-9.09	-2.27	-25.27	1.00	5.00	-20.22	-4.04	-66.14
Colombia	2.00	3.00	0.11	-3.53	-0.91	-8.68					
Costa Rica	2.00	4.00	0.12	-1.69	-0.66	-3.05					
Uruguay	4.00	5.50	0.28	-9.36	-1.61	-28.20	1.00	7.00	-20.00	-2.86	-71.14
Venezuela	5.00	4.20	0.35	-10.08	-1.94	-21.03	2.00	6.00	-19.49	-3.05	-43.50
Mexico	6.00	3.67	0.20	-4.28	-1.41	-8.06	1.00	2.00	-10.32	-5.16	-10.26
Peru	7.00	3.14	0.19	-10.25	-3.31	-23.26	2.00	4.50	-24.70	-7.30	-66.19
Ecuador	2.00	3.50	0.10	-4.37	-1.41	-9.06					
Others											
Turkey	5.00	3.80	0.23	-6.79	-2.18	-14.67	2.00	3.00	-11.01	-4.34	-17.53
South Africa	3.00	8.33	0.21	-4.53	-0.64	-16.14					
Israel	5.00	3.80	0.16	-7.57	-1.60	-41.75	1.00	7.00	-25.92	-3.70	-192.49
Country Group											
Emerging Countries											
Median	4.00	3.00	0.19	-4.81	-1.24	-8.93	1.00	5.00	-12.73	-3.70	-27.16
Mean	4.00	3.92	0.19	-6.54	-1.69	-17.08	1.40	4.86	-15.64	-3.67	-46.67
Standard Deviation	2.18	2.10	0.08	6.46	1.60	27.88	0.83	2.13	6.43	1.97	42.81
Asia											
Median	2.00	3.00	0.12	-2.73	-1.12	-4.22	1.00	5.00	-13.14	-2.43	-38.24
Mean	2.88	3.65	0.12	-5.27	-1.33	-13.85	1.00	5.50	-13.16	-2.63	-41.60
Standard Deviation	1.54	2.01	0.05	5.37	1.02	21.35	0.00	2.51	4.07	0.89	26.62
Latin America											
Median	4.50	3.00	0.25	-5.41	-1.59	-9.26	1.00	4.50	-13.93	-3.76	-30.57
Mean	4.80	3.79	0.23	-7.13	-1.89	-16.37	1.71	4.67	-16.79	-4.07	-41.91
Standard Deviation	2.48	1.77	0.08	6.90	1.78	21.73	1.11	1.97	6.98	2.26	29.54
Others											
Median	5.00	5.00	0.21	-4.88	-1.07	-11.17	1.50	4.00	-12.73	-3.70	-25.32
Mean	4.33	4.85	0.20	-6.57	-1.60	-25.42	1.50	4.33	-15.98	-4.13	-75.85
Standard Deviation	0.94	3.08	0.03	6.68	1.71	50.92	0.71	2.52	8.78	2.05	101.31
OECD											
Median	3.00	3.00	0.13	-1.72	-0.43	-2.74	1.50	5.00	-4.54	0.96	-11.07
Mean	3.86	3.73	0.13	-2.22	-0.60	-6.12	2.00	5.45	-5.19	-1.22	-17.65
Standard Deviation	1.52	2.09	0.04	2.23	0.62	12.59	1.33	6.25	-4.42	-0.74	-14.41
G7											
Median	3.00	3.00	0.12	-1.36	-0.36	-2.99	1.00	6.50	-4.13	-0.83	-14.64
Mean	3.86	3.70	0.13	-1.70	-0.44	-4.39	1.41	3.03	2.61	0.96	21.65
Standard Deviation	1.46	1.68	0.03	1.42	0.26	5.43	0.58	1.71	1.32	0.21	7.44

Notes: Duration is the number of quarters between a peak and the next trough of a recession. Proportion of time in recession refers to the ratio of the number of quarters in which the economy is in recession over the full cycle period. Amplitude is the percent change in output from a peak to the next trough of a recession. Slope is the ratio of amplitude to duration. Cumulative loss combines information about the duration and amplitude to measure the overall cost of a recession and is expressed in percent. Severe recessions are those in which the peak-to-trough decline in output is in the top 25 percent of all recession-related output declines. Country-specific data are means. Country-group data are means/medians.

Table 1B. Recessions in Emerging Markets: Macroeconomic and Financial Variables*(Percent change unless otherwise indicated)*

	Median Values			Mean Values		
	All Recessions	Severe Recessions	Other Recessions	All Recessions	Severe Recessions	Other Recessions
A. Output						
Duration ^{1/}	3.00	5***	3.00	3.92	4.86**	3.60
Amplitude	-4.81	-12.73***	-3.11	-6.54	-15.64***	-3.50
Slope	-1.24	-3.7***	-1.07	-1.69	-3.67***	-1.03
Cumulative Loss	-8.93	-27.16***	-4.34	-17.08	-46.67***	-7.22
B. Components of Output						
Consumption	-2.78	-11.61***	-0.92	-2.80	-5.62	-1.98
Investment	-13.13	-44.99***	-9.87	-17.09	-39.42***	-11.12
Exports	0.56	3.83	0.22	-0.27	0.03	-0.36
Imports	-10.18	-25.13***	-7.98	-11.91	-24.59***	-8.29
Net Export (% of GDP) ^{2/}	1.63	5.65***	1.01	3.88	9.34**	2.32
Current Account (% of GDP) ^{2/}	2.42	6.15***	0.97	3.60	8.61**	2.13
C. Other Macroeconomic Variables						
Industrial Production	-8.21	-13.68***	-5.47	-6.94	-14.09**	-4.47
Unemployment Rate ^{2/}	1.06	3**	0.84	1.53	2.63*	1.20
Inflation Rate ^{2/}	0.62	20.18***	0.13	271.83	1218.53	-10.53
NEER	-11.72	-55.21***	-5.29	-24.11	-53.09***	-14.45
REER	-3.46	-26.75***	-1.13	-3.95	-18.24***	0.89
Export Price	-0.40	-2.84	-0.25	-1.57	-2.27	-1.37
Import Price	-0.64	-3.28	-0.48	-1.35	-3.25	-0.84
Terms of Trade	-0.11	-0.11	-0.11	-0.66	-1.48	-0.44
D. Financial Variables						
Equity Prices	-17.53	-45.54***	-12.04	-11.00	-39.7***	-2.50
Credit	-1.93	-18.53***	0.02	-4.10	-16.14**	0.05

Notes: Severe recessions are those in which the peak-to-trough decline in output is in the top 25 percent of all recession-related output declines. Other recessions refer to episodes that are not severe recessions. In each cell, the mean (median) change in the respective variable from peak to trough of recessions is reported, unless otherwise indicated. The symbols *, **, and *** indicate that the difference between means (medians) of severe recessions and other recessions is significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

^{1/} Number of quarters.

^{2/} Change in levels.

Table 1C. Recessions in Advanced Countries: Basic Features*(Percent change unless otherwise indicated)*

	Median Values			Mean Values		
	All Recessions	Severe Recessions	Other Recessions	All Recessions	Severe Recessions	Other Recessions
A. Output						
Duration ^{1/}	3.00	5***	3.00	3.73	5.45***	3.16
Amplitude	-1.72	-4.54***	-1.02	-2.22	-5.19***	-1.25
Slope	-0.43	-0.98***	-0.35	-0.60	-1.22***	-0.40
Cumulative Loss	-2.74	-11.07***	-1.81	-6.12	-17.65**	-2.34
B. Components of Output						
Consumption	-0.22	-1.26**	-0.02	-0.60	-1.50	-0.30
Investment	-4.15	-10.63*	-3.98	-6.34	-10.91*	-4.84
Exports	-0.89	-1.11	-0.80	-0.85	-3.53	0.03
Imports	-3.15	-8.43***	-1.35	-3.82	-8.9**	-2.16
Net Export (% of GDP) ^{2/}	0.55	2.02*	0.45	0.83	1.38	0.65
Current Account (% of GDP) ^{2/}	0.48	1.05	0.45	0.65	1.06	0.51
C. Other Macroeconomic Variables						
Industrial Production	-4.03	-5.92***	-2.89	-3.66	-6.11***	-2.86
Unemployment Rate ^{2/}	0.66	1.44***	0.51	1.28	2.83**	0.82
Inflation Rate ^{2/}	-0.32	-1.67	-0.31	-0.49	-0.78	-0.40
NEER	0.05	-3.95**	0.51	-1.01	-4.33	0.08
REER	0.81	0.80	0.81	0.74	1.41	0.52
Export Price	-1.10	-4.76**	0.87	1.16	-0.45	1.80
Import Price	0.36	-3.62	1.01	2.40	1.22	2.86
Terms of Trade	-0.14	-2.72**	0.02	-0.38	-1.73	0.16
D. Financial Variables						
Equity Prices	-3.29	-38.79***	-13.10	-3.04	-5.83	-2.30
Credit	0.34	-15.11**	0.02	0.32	0.54	0.24

Notes: Severe recessions are those in which the peak-to-trough decline in output is in the top 25 percent of all recession-related output declines. Other recessions refer to episodes that are not severe recessions. In each cell, the mean (median) change in the respective variable from peak to trough of recessions is reported, unless otherwise indicated. The symbols *, **, and *** indicate that the difference between means (medians) of severe recessions and other recessions is significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

^{1/} Number of quarters.

^{2/} Change in levels.

Table 1D. Synchronized Recessions Among Emerging Markets
(Percent change unless otherwise indicated)

	Median Values			Mean Values		
	All Recessions	Synchronized Recessions	Other Recessions	All Recessions	Synchronized Recessions	Other Recessions
A. Output						
Duration ^{1/}	3.00	4**	3.00	3.92	4.48*	3.65
Amplitude	-4.81	-6.41*	-4.07	-6.54	-7.88	-5.90
Slope	-1.24	-1.53	-1.21	-1.69	-1.73	-1.68
Cumulative Loss	-8.93	-13.56**	-7.04	-17.08	-20.16	-15.62
B. Components of Output						
Consumption	-2.78	-4.25	-1.84	-2.80	-2.55	-2.95
Investment	-13.13	-21.67***	-9.54	-17.09	-24.54***	-12.53
Exports	0.56	-5.76***	2.19	-0.27	-6.6***	3.53
Imports	-10.18	-15.8***	-6.14	-11.91	-18.75***	-7.81
Net Export (% of GDP) ^{2/}	1.63	3.95*	1.33	3.88	5.93	2.66
Current Account (% of GDP) ^{2/}	2.42	4.52*	1.27	3.60	5.55**	1.98
C. Other Macroeconomic Variables						
Industrial Production	-8.21	-9.46***	-4.96	-6.94	-11.55**	-4.29
Unemployment Rate ^{2/}	1.06	1.94***	0.34	1.53	2.39***	0.82
Inflation Rate ^{2/}	0.62	0.47	0.63	271.83	3.12	426.19
NEER	-11.72	-6.05	-17.90	-24.11	-16.19*	-27.86
REER	-3.46	-3.13	-3.49	-3.95	-9.42	-1.31
Export Price	-0.40	-6.19***	1.59	-1.57	-7.32***	1.62
Import Price	-0.64	-5.41***	1.52	-1.35	-6.28***	1.34
Terms of Trade	-1.24	0.15	-0.28	-1.69	-0.49	-0.75
D. Financial Variables						
Equity Prices	-17.53	-23.91***	-7.46	-11.00	-29.58***	-0.68
Credit	-1.93	-4.55	-1.09	-4.10	-3.38	-4.45

Notes: Synchronized recessions are those in which at least 35% of the 24 emerging market economies are in recession. Other recessions refer to episodes that are not synchronized. In each cell, the mean (median) change in the respective variable from peak to trough of recessions is reported, unless otherwise indicated. (The symbols *, **, *** indicate the difference between means (medians) of synchronized recessions and other recessions is significant at the 10 percent, 5 percent, and 1 percent levels respectively.)

^{1/} Number of quarters.

^{2/} Change in levels.

Table 2. Recessions, Credit Contractions and Equity Price Declines: Summary Statistics*(Percent change unless otherwise indicated)*

Events	Duration ^{1/} (Mean)	Amplitude (Median)	Slope (Median)	Output (Median)	Investment (Median)	Unemployment ^{2/} (Median)
Emerging Market Countries						
Recessions	3.92	-4.81	-1.24	-4.81	-13.13	1.06
Severe Recessions	4.86**	-12.73***	-3.7***	-12.73***	-44.99***	3**
Other Recessions	3.60	-3.11	-1.07	-3.11	-9.87	0.84
Credit Contractions	6.66	-11.75	-1.89	1.93	-6.08	0.25
Credit Crunches	12.27***	-50.18***	-5.29***	-0.46	-16.76***	0.53
Other Credit Contractions	4.86	-7.29	-1.56	2.80	-1.12	0.25
Equity Price Declines	5.93	-36.66	-6.43	3.42	3.07	0.11
Equity Price Busts	9.44***	-68.79***	-9.03***	1.91	-6.76**	0.43**
Other Equity Price Declines	4.75	-30.21	-6.10	3.44	4.40	0.05
Advanced Countries						
Recessions	3.73	-1.72	-0.43	-1.72	-4.15	0.66
Severe Recessions	5.45***	-4.54***	-0.98***	-4.54***	-10.63*	1.44***
Other Recessions	3.16	-1.02	-0.35	-1.02	-3.98	0.51
Credit Contractions	6.03	-3.64	-0.85	1.42	-0.28	0.55
Credit Crunches	12.29***	-13.06***	-1.39***	4.18***	-6.13***	1.48***
Other Credit Contractions	4.06	-2.74	-0.64	1.13	0.40	0.22
Equity Price Declines	5.38	-22.54	-4.55	2.71	2.77	-0.01
Equity Price Busts	8.68***	-45.81***	-5.6***	2.89	0.49	0.8***
Other Equity Price Declines	4.27	-17.96	-3.85	2.47	3.29	-0.06

Notes: Credit crunches and asset price busts correspond to peak-to-trough declines in credit and asset prices that are in the top 25 percent of all episodes of credit contractions and asset price declines, respectively. In each cell, the mean (median) change in the respective variable from peak to trough of the episodes of credit declines/crunches, house price declines/busts, and equity price declines/busts is reported, unless otherwise indicated. The symbols *, **, and *** indicate that the difference between means (medians) of crunches/busts and other contractions/declines is significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

^{1/} Number of quarters.

^{2/} Change in levels.

Table 3. Leads and Lags: Recessions, Crunches and Busts
(number of quarters)

	Median Values	Mean Values
Emerging Market Countries		
A. Leads ^{1/}		
Credit Crunches	1.50	5.83
Equity Price Busts	2.50	4.59
B. Lags ^{2/}		
Credit Crunches	5.50	5.00
Equity Price Busts	1.00	1.05
Advanced Countries		
A. Leads ^{1/}		
Credit Crunches	4.50	4.50
Equity Price Busts	4.00	4.57
B. Lags ^{2/}		
Credit Crunches	5.00	4.25
Equity Price Busts	-1.00	0.67

^{1/} Number of quarters between the start of a crunch/bust and the start of a recession.

^{2/} Number of quarters between the end of a recession and the end of a crunch/bust.

Table 4. Recessions Associated with Credit Crunches*(Percent change unless otherwise indicated)*

	Median Values			Mean Values		
	Without Crunches	With Crunches	With Severe Crunches	Without Crunches	With Crunches	With Severe Crunches
A. Output						
Duration ^{1/}	3.00	4.00	3.00	4.03	3.64	3.57
Amplitude	-4.67	-8.48*	-11.15**	-6.03	-9.65	-13.55*
Slope	-1.19	-2.44**	-3.81***	-1.43	-3.09*	-4.3*
Cumulative Loss	-8.78	-11.12	-15.99	-17.02	-19.59	-28.08
B. Components of Output						
Consumption	-1.33	-9.19***	-13.56***	-1.30	-9.61**	-13.45**
Investment	-11.24	-29.98**	-33.77**	-15.63	-26.15*	-31.34*
Exports	-1.42	7.02***	6.05**	-2.75	10.8***	6.6*
Imports	-9.92	-14.56	-25.3**	-11.11	-17.23	-26.62*
Net Export (% of GDP) ^{2/}	1.46	5.99**	5.03*	3.61	5.79	5.98
Current Account (% of GDP) ^{2/}	2.18	5.53	6.63	3.63	3.43	5.54
C. Other Macroeconomic Variables						
Industrial Production	-8.05	-10.71*	-15.87*	-6.03	-11.16	-13.15
Unemployment Rate ^{2/}	0.95	3.88**	4.41*	1.32	3.59**	4.41
Inflation Rate ^{2/}	0.41	16.09**	9.66***	202.36	664.68	1570.15
NEER	-8.16	-42.86***	-43.47***	-20.45	-45.97**	-61.18**
REER	-3.08	-24.82*	-21.02	-1.80	-15.79*	-11.78
Export price	-0.31	-1.88	2.07	-1.72	-1.53	5.63
Import price	-0.64	0.63	4.64	-1.57	-0.52	3.14
Terms of Trade	0.15	-4.57**	-4.58*	0.24	-5.82*	-4.29
D. Financial Variables						
Equity Prices	-16.12	-20.19	-46.96**	-10.92	-11.89	-45.75**
Credit	0.09	-20.79***	-20.5***	0.39	-25.9***	-33.83***

Notes: Number of recessions with crunches is 14, and with severe crunches is 7. Number of recessions without crunches is 68. Severe credit crunches are those that are in the top half of all crunch episodes. In each cell, the mean (median) change in the respective variable from peak to trough of recessions associated with credit crunches is reported, unless otherwise indicated. The symbols *, **, and *** indicate that the difference between means (medians) of recessions with credit crunches and recessions without credit crunches is significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

^{1/} number of quarters.

^{2/} change in level.

Table 5 . Recessions Associated with Equity Price Busts
(Percent change unless otherwise indicated)

	Median Values			Mean Values		
	Without Busts	With Busts	With Severe Busts	Without Busts	With Busts	With Severe Busts
A. Output						
Duration ^{1/}	3.00	3.00	4.5*	3.62	4.04	4.58
Amplitude	-3.25	-6.82*	-10.27***	-5.10	-7.47	-11.08**
Slope	-1.17	-1.53	-2.44***	-1.45	-1.77	-2.47**
Cumulative Loss	-4.62	-13.56*	-23.51***	-12.68	-20.46	-31.69**
B. Components of Output						
Consumption	-0.56	-3.93*	-5.48	-2.16	-0.91	3.22
Investment	-8.36	-25.44***	-34.16***	-10.57	-25.81***	-32.03**
Exports	0.00	0.97	2.96	-0.01	-2.02	-0.68
Imports	-5.72	-19.7***	-24.61***	-6.37	-17.3**	-21.66***
Net Export (% of GDP) ^{2/}	0.95	3.95*	5.62***	1.63	4.7*	8.13**
Current Account (% of GDP) ^{2/}	0.75	4.69*	5.53**	2.01	5.78**	9.04**
C. Other Macroeconomic Variables						
Industrial Production	-6.70	-8.31	-11.02	-6.37	-5.86	-5.80
Unemployment Rate ^{2/}	0.81	1.94**	3.80	1.14	2.33**	2.63
Inflation Rate ^{2/}	0.32	2.80	4.2*	294.40	4.82	11.64
NEER	-4.90	-21.42	-35.09**	-21.51	-25.14	-37.24*
REER	-3.49	-3.08	-11.76	-6.80	-5.36	-8.07
Export price	1.48	-5.89***	-4.70	-0.39	-4.63	-2.98
Import price	-0.02	-5.41**	-2.77	-0.05	-5.58**	-4.91
Terms of Trade	-0.28	-0.04	-0.04	-0.04	-0.82	-2.54
D. Financial Variables						
Equity Prices	-8.75	-27.3***	-55.37***	2.57	-35.43***	-50.24***
Credit	0.58	-6.56**	-15.54**	0.17	-11.79**	-18.56**

Notes: Number of recessions with equity price busts is 25, and with severe equity price busts is 12. Number of recessions without equity price busts is 45. Severe equity price busts are those that are in the top half of all bust episodes. In each cell, the mean (median) change in the respective variable from peak to trough of recessions associated with equity price busts is reported, unless otherwise indicated. The symbols *, **, and *** indicate that the difference between means (medians) of recessions with equity price busts and recessions without equity price busts is significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

^{1/} number of quarters.

^{2/} change in level.

Table 6. Recessions Associated with Financial Crisis*(Percent change unless otherwise indicated)*

	Median Values			Mean Values		
	Without Crisis	With Crisis	With Severe Crisis	Without Crisis	With Crisis	With Severe Crisis
A. Output						
Duration ^{1/}	3.00	4.00	4.00	3.86	4.10	4.60
Amplitude	-4.33	-8.27***	-12.51***	-5.70	-9.22**	-13.51***
Slope	-1.08	-1.85***	-3.33***	-1.48	-2.37**	-3.24***
Cumulative Loss	-7.03	-16.55***	-30.12***	-14.98	-23.79	-38.04**
B. Components of Output						
Consumption	-1.13	-7.04**	-10.93*	-3.47	-0.08	4.34
Investment	-10.21	-36.27***	-44.99***	-12.97	-33.88***	-42***
Exports	0.22	3.32	4.54	-0.61	1.11	0.53
Imports	-7.60	-23.38***	-25.34***	-8.33	-26.72***	-27.43**
Net Export (% of GDP) ^{2/}	1.47	6.34**	6.69***	3.33	6.19	7.61*
Current Account (% of GDP) ^{2/}	0.97	6.33***	6.63***	2.29	8.05***	9.2**
C. Other Macroeconomic Variables						
Industrial Production	-5.50	-10.33*	-11.52*	-6.66	-7.84	-6.73
Unemployment Rate ^{2/}	0.84	2.24	3.24	1.34	2.34	2.72
Inflation Rate ^{2/}	0.29	6.75**	8.95***	134.61	769.21	1419.91
NEER	-5.19	-42.94***	-42.94***	-17.15	-46.38***	-49.74***
REER	0.18	-23.89***	-30.01***	1.06	-19.74***	-27.01***
Export Price	-0.39	-5.28	-8.00	-1.41	-2.19	-8.61
Import Price	-0.25	-4*	-5.41*	-0.64	-4.20	-8.37
Terms of Trade	-0.11	-0.46	-0.88	-0.76	-0.22	-1.44
D. Financial Variables						
Equity Prices	-16.20	-20.5*	-47.68***	-5.03	-29.62**	-47.07***
Credit	-0.60	-7.33*	-18.78	-1.55	-12*	-13.48

Notes: Number of recessions with financial crises is 20, and with severe financial crises is 10. Number of recessions without financial crises is 64. Severe financial crises are those that are in the top half of all recession. In each cell, the mean (median) change in the output from peak to trough of recessions associated with (severe) financial crisis is reported, unless otherwise indicated. The symbols *, **, and *** indicate that the difference between means (medians) of recessions with (severe) financial crises and recessions without financial crises is significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

^{1/} number of quarters.

^{2/} change in level.

Table 7. Recessions Associated with Crunches, Busts, and Crises: Summary Statistics

Events	Duration Mean	Amplitude Median	Cumulative Loss Median
A. Recessions	3.92	-4.81	-8.93
Severe Recessions	4.86**	-12.73***	-27.16***
Other Recessions	3.60	-3.11	-4.34
B. Recessions without credit crunches	4.03	-4.67	-8.78
Recessions with credit crunches	3.64	-8.48*	-11.12
Recessions with severe credit crunches	3.57	-11.15**	-15.99
C. Recessions without equity price busts	3.62	-3.25	-4.62
Recessions with equity price busts	4.04	-6.82*	-13.56*
Recessions with severe equity price busts	4.58	-10.27***	-23.51***
D. Recessions without financial crises	3.86	-4.33	-7.03
Recessions with financial crises	4.10	-8.27***	-16.55***
Recessions with severe financial crises	4.60	-12.51***	-30.12***

Notes: Severe credit crunches and equity/house price busts are in the top half of all crunch and bust episodes. Severe financial crises correspond to the top half of all recessions. Each cell reports the mean (median) change in the respective variable from peak to trough of recessions. The symbols *, **, *** indicate that the difference between means (medians) of recessions with and without bust, crunch or crises is significant at the 10%, 5%, and 1% levels, respectively.

Table 8. Changes in Basic Indicators of Policies
(Recessions, credit contractions and asset price declines; median values)

Events	Short-Term Nominal Interest Rate ^{1/}	Short-Term Real Interest Rate ^{2/}	Government Consumption ^{3/}
A. Recessions	-0.14	-0.98	-0.64
Severe Recessions	0.44	-2.11	-7.26
Other Recessions	-0.29	-0.91	0.12
B. Credit Contractions	-0.69	-2.64	1.58
Credit Crunches	-2.09	-7.32	1.47
Other Credit Contractions	-0.67	-2.22	1.80
C. Equity Price Declines	0.20	0.33	3.78
Equity Price Busts	0.43	-1.18	7.03
Other Equity Price Declines	0.16	0.54	3.29
D. Recessions without Credit Crunches	-0.10	-0.84	-0.43
Recessions with Credit Crunches	-0.65	-4.42	-0.85
Recessions with Severe Credit Crunches	-0.65	4.46	-8.72***
E. Recessions without Equity Price Busts	-0.19	-0.53	-0.38
Recessions with Equity Price Busts	-0.21	-2.11	0.19
Recessions with Severe Equity Price Busts	0.24	-0.98	-5.34
F. Recessions without Financial Crises	-0.21	-0.84	0.19
Recessions with Financial Crises	0.24	-2.67	-4.14
Recessions with Severe Financial Crises	3.04	-1.28	-0.85

Notes : Severe recessions are those in which the peak-to-trough decline in output is in the top 25 percent of all recession-related output declines. Credit crunches and asset price busts correspond to peak-to-trough contractions in credit and declines in asset prices that are in the top 25 percent of all episodes of credit contractions and asset price declines, respectively. Severe credit crunches and equity/house price busts are those that are in the top half of all crunch and bust episodes. Other contractions, declines and non-crises refer to episodes that are not crunches and busts or crises, respectively. In each cell, the mean (median) change in the respective variable from peak to trough of relevant episodes is reported, unless otherwise indicated. The symbols *, **, and *** indicate that the difference between medians of crunches/busts/shocks and other contractions/declines/non-crises is significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

^{1/} Treasury bill interest rate. Change in levels.

^{2/} Ex-post real interest rate. Deflated with each country's CPI. Change in levels.

^{3/} Percent change.

Table 9. Correlates of Costs of Recessions
(Percent change in real variables unless otherwise indicated)

	OLS		Quantile	
	Regression		Regressions	
	(1)	(2)	(3)	(4)
Credit	0.085** [0.040]	. .	0.075** [0.035]	. .
Equity Prices	. .	0.022 [0.020]	. .	0.028* [0.016]
N of Observations	82	70	82	70
Adjusted R2	0.068	0.013		

Notes: The dependent variable is the amplitude of a recession, measured as the change in output from peak to the next trough of a recession. Credit and equity prices refer to the changes in the respective variables during a recession. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 10. Correlates of Costs of Recessions
(Percent change in real variables unless otherwise indicated)

	OLS Regressions					
	(1)	(2)	(3)	(4)	(5)	(6)
Initial Output	0.193* [0.106]	0.139 [0.105]	0.206** [0.098]	0.150 [0.098]	0.204** [0.099]	0.151 [0.099]
Openness	-1.302* [0.670]	-1.064* [0.596]	-1.314** [0.639]	-1.057* [0.581]	-1.312* [0.670]	-1.082* [0.602]
Crisis Dummy	1.855 [1.600]	1.801 [1.497]	1.109 [1.746]	1.183 [1.617]	1.071 [1.752]	1.172 [1.638]
Terms of Trade	-0.037 [0.093]	-0.042 [0.081]	... ...	... ...	-0.035 [0.095]	-0.039 [0.085]
Real Effective Exchange Rate	... ...	... ...	0.036 [0.028]	0.028 [0.028]	0.036 [0.029]	0.029 [0.029]
Credit	0.081* [0.043]	0.083** [0.038]	0.087* [0.044]	0.087** [0.039]	0.085* [0.043]	0.085** [0.039]
Duration of Recession ¹	... ...	1.159*** [0.434]	... ...	1.108*** [0.408]	... ...	1.104*** [0.410]
Constant	9.122*** [3.254]	4.164 [3.219]	9.046*** [3.088]	4.238 [3.181]	9.161*** [3.242]	4.427 [3.242]
Adjusted R-squared	0.157	0.296	0.199	0.324	0.182	0.309
Number of observations	74	74	75	75	73	73

Notes: The dependent variable is the amplitude of a recession, measured as the change in output from the peak to the next trough of a recession. Terms of trade, real effective exchange rate, and credit refer to the changes in the respective variable during recessions. Openness (proxied here as the sum of imports and exports to GDP ratio) is the level of openness in the economy one year prior to the recession. Initial output is the growth of output over the two years prior to the recession. Crisis dummy signifies whether a recessions is associated with a financial crisis. Duration of recession is the length of the recession in quarters. Robust standard errors are in brackets. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

¹ Number of quarters

Table 11. Correlates of Costs of Recessions with Fixed Effects
(Percent change in real variables unless otherwise indicated)

	FE					
	Regressions					
	(1)	(2)	(3)	(4)	(5)	(6)
Initial Output	0.224* [0.124]	0.148 [0.117]	0.234** [0.109]	0.160 [0.103]	0.236** [0.109]	0.162 [0.104]
Openness	-5.003 [3.546]	-3.493 [3.659]	-3.892 [3.282]	-2.520 [3.351]	-3.740 [3.422]	-2.466 [3.385]
Crisis Dummy	4.116*** [1.456]	4.052*** [1.375]	3.144** [1.498]	3.204** [1.447]	3.251** [1.502]	3.262** [1.454]
Terms of Trade	0.066 [0.082]	0.033 [0.071]	... ...	... ...	0.061 [0.081]	0.032 [0.071]
Real Effective Exchange Rate	... ...	... ...	0.045* [0.025]	0.039 [0.024]	0.044* [0.025]	0.038 [0.024]
Credit	0.106* [0.056]	0.095* [0.049]	0.109** [0.053]	0.099** [0.047]	0.112** [0.055]	0.101** [0.049]
Duration of Recession ¹	... ...	1.279*** [0.406]	... ...	1.227*** [0.376]	... ...	1.218*** [0.383]
Constant	21.116 [13.543]	11.861 [14.810]	16.384 [12.594]	7.934 [13.508]	15.942 [13.026]	7.812 [13.565]
Adjusted R-squared	0.214	0.351	0.272	0.400	0.259	0.386
Number of observations	74	74	75	75	73	73

Notes: The dependent variable is the amplitude of a recession, measured as the change in output from the peak to the next trough of a recession. Terms of trade, real effective exchange rate, and credit refer to the changes in the respective variable during recessions. Openness is the level of openness in the economy one year prior to the recession. Initial output is the growth of output over the two years prior to the recession. Crisis dummy signifies whether a recessions is associated with a financial crises. Duration of recession is the length of the recession in quarters. Robust standard errors are in brackets. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

¹ Number of quarters