

Banco Central de Chile
Documentos de Trabajo

Central Bank of Chile
Working Papers

N° 585

Junio 2010

**RECESSIONS AND FINANCIAL DISRUPTIONS IN
EMERGING MARKETS: A BIRD'S EYE VIEW**

Stijn Claessens M. Ayhan Kose Marco E. Terrones

La serie de Documentos de Trabajo en versión PDF puede obtenerse gratis en la dirección electrónica: <http://www.bcentral.cl/esp/estpub/estudios/dtbc>. Existe la posibilidad de solicitar una copia impresa con un costo de \$500 si es dentro de Chile y US\$12 si es para fuera de Chile. Las solicitudes se pueden hacer por fax: (56-2) 6702231 o a través de correo electrónico: bcch@bcentral.cl.

Working Papers in PDF format can be downloaded free of charge from: <http://www.bcentral.cl/eng/stdpub/studies/workingpaper>. Printed versions can be ordered individually for US\$12 per copy (for orders inside Chile the charge is Ch\$500.) Orders can be placed by fax: (56-2) 6702231 or e-mail: bcch@bcentral.cl.



BANCO CENTRAL DE CHILE

CENTRAL BANK OF CHILE

La serie Documentos de Trabajo es una publicación del Banco Central de Chile que divulga los trabajos de investigación económica realizados por profesionales de esta institución o encargados por ella a terceros. El objetivo de la serie es aportar al debate temas relevantes y presentar nuevos enfoques en el análisis de los mismos. La difusión de los Documentos de Trabajo sólo intenta facilitar el intercambio de ideas y dar a conocer investigaciones, con carácter preliminar, para su discusión y comentarios.

La publicación de los Documentos de Trabajo no está sujeta a la aprobación previa de los miembros del Consejo del Banco Central de Chile. Tanto el contenido de los Documentos de Trabajo como también los análisis y conclusiones que de ellos se deriven, son de exclusiva responsabilidad de su o sus autores y no reflejan necesariamente la opinión del Banco Central de Chile o de sus Consejeros.

The Working Papers series of the Central Bank of Chile disseminates economic research conducted by Central Bank staff or third parties under the sponsorship of the Bank. The purpose of the series is to contribute to the discussion of relevant issues and develop new analytical or empirical approaches in their analyses. The only aim of the Working Papers is to disseminate preliminary research for its discussion and comments.

Publication of Working Papers is not subject to previous approval by the members of the Board of the Central Bank. The views and conclusions presented in the papers are exclusively those of the author(s) and do not necessarily reflect the position of the Central Bank of Chile or of the Board members.

Documentos de Trabajo del Banco Central de Chile
Working Papers of the Central Bank of Chile
Agustinas 1180, Santiago, Chile
Teléfono: (56-2) 3882475; Fax: (56-2) 3882231

RECESSIONS AND FINANCIAL DISRUPTIONS IN EMERGING MARKETS: A BIRD'S EYE VIEW

Stijn Claessens
International Monetary Fund
University of Amsterdam
and CEPR

M. Ayhan Kose
International Monetary Fund

Marco E. Terrones
International Monetary Fund

Resumen

Basado en una visión general de las implicancias de episodios recesivos y otras disrupciones financieras en mercados emergentes, este estudio presenta tres conclusiones importantes. La primera es que en estas economías dichos episodios a menudo resultan más costosos que en los países avanzados. La segunda es que, en los mercados emergentes, una recesión que esté asociada con un episodio de alteración financiera, como un colapso crediticio, una caída de precios de activos o una crisis financiera, tenderá a ser más profunda que otras recesiones. La tercera es que la dinámica temporal de las variables macroeconómicas y financieras durante estos episodios son diferentes en una economía emergente que en un país desarrollado. A la luz de estas observaciones generales, el documento analiza recesiones y problemas del sistema financiero ocurridos en Chile.

Abstract

This paper provides an overview of the implications of recession and financial disruption episodes in emerging markets. We report three major findings. First, compared to advanced countries, recessions and financial disruptions in emerging markets are often more costly. Second, recessions associated with financial disruption episodes, such as credit crunches, equity price busts and financial crises, tend to be deeper than other recessions in emerging markets. Third, the temporal dynamics of macroeconomic and financial variables around these episodes in emerging markets are different than those in advanced countries. In light of these broad observations, the paper provides a review of recessions and financial market disruptions in Chile.

E-mails: sclaessens@imf.org; akose@imf.org; mterrones@imf.org. An earlier version of this paper was presented at the 13th Annual Conference of the Central Bank of Chile on "Monetary Policy under Financial Turbulence." We would like to thank our discussant, Norman Loayza, and conference participants for their useful suggestions. We would also like to thank David Fritz and Ezgi Ozturk for providing outstanding research assistance. The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF or IMF policy.

I. Introduction

The global financial crisis of 2008-2009 led to massive interruptions in cross-border financial and trade flows. As a result of the crisis, virtually all of the advanced economies and many emerging market countries experienced recessions over the past two years. These recessions coincided with various forms of financial disruptions, such as severe contractions in the supply of credit and sharp declines in asset prices. Understanding the linkages between recessions and periods of financial disruptions has become a new challenge for macroeconomic research.

The objective of this paper is to provide a brief overview of the linkages between recessions and financial disruptions for a large group of emerging market economies. In particular, we attempt to answer the following questions: First, what are the main features of recessions and financial disruptions in emerging markets? Second, how synchronized are these events across emerging markets? Third, how does the coincidence between recessions and financial disruptions affect macroeconomic outcomes? For each of these questions, we contrast the experience of emerging market economies with that of a group of advanced countries. In addition, we provide a brief case study analysis of recessions and financial disruptions in Chile, and consider how the Chilean case compares to other emerging markets.

In order to address these questions, we construct a comprehensive dataset of key macroeconomic and financial variables covering 23 emerging market countries over the period 1978:1-2007:4. Using a standard business cycle dating algorithm, we first document turning points in our main variables of interest, including output, credit, and equity prices. We identify 84 recessions, 102 credit contractions, and 139 equity price declines for these countries over this period. 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. We also identify 20 recessions associated with episodes of financial crises in emerging markets.

Armed with this rich set of events, we conduct a number of exercises. First, we examine the main 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, equity price busts, and financial crises, and analyze the implications of recessions for key macroeconomic aggregates. We also examine how these features vary across regions. In addition, we consider how episodes of recessions and financial disruptions in emerging markets are different from those in advanced economies.

In light of the facts we document for the broader set of emerging markets, we next explore the main features of recessions and financial disruptions in Chile. We focus on the Chilean case for a few reasons. First, the growth performance of the Chilean economy has been a major success story over the past three decades. Second, it has been widely recognized that Chile's macroeconomic and financial sector policies have been instrumental in moderating business and financial cycles during this period. Third, the relative success of Chile in managing the adverse effects of the recent global financial crisis also makes it an interesting case study. We briefly review the three recession episodes Chile experienced prior to the recent crisis and examine the macroeconomic implications of disruptions in its credit and equity markets. We put our findings into context by providing a review of the related literature regarding business cycles in Chile.

Our study contributes to a large body of research on business cycles and growing research analyzing the interactions between macroeconomic and financial variables over the business cycle. While most empirical work is focused on advanced countries, there is a rich set of theoretical studies analyzing the implications of financial disruptions for the real economy in the context of emerging market countries. Krugman (1999) and Aghion, Bacchetta, and Banerjee (2001), for example, show how a combination of financial market imperfections and currency mismatches can translate into highly volatile business cycle fluctuations in emerging markets. Using the financial accelerator construct, Cespedes, Chang, and Velasco (2004) study how linkages between exchange rates and corporate balance sheets affect macroeconomic outcomes

in small open economies.¹ Caballero and Krishnamurthy (1998) and Schneider and Tornell (2004) model how, also because of balance sheet constraints, fluctuations in credit and asset markets can translate into boom-bust cycles in emerging market economies.²

Several empirical studies provide evidence of these interactions in the context of advanced countries. For example, 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 using micro data (banks or corporations) (see Bernanke, Gertler and Gilchrist, 1996; Kashyap and Stein, 2000). Recent research also considers for advanced countries how interactions between financial and real activity variables can vary during recessions. For example, Claessens, Kose, and Terrones (2009) report that recessions in advanced countries associated with episodes of sharp declines in credit or asset prices are typically longer and deeper than normal recessions. However, knowledge of interactions between real and financial sectors during periods of downturns in emerging markets has been rather limited.

We also contribute to a branch of the literature on business cycles that 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 to study recessions in advanced countries. Only a few studies have used this methodology to analyze the turning points of

¹ 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 in emerging markets.

² Recent research also considers how fluctuations in asset prices affect the value of collateral required for international funding. Mendoza (2010) shows 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 can result in a large impact on output.

business cycles in emerging markets using quarterly data.³ However, these studies have focused mostly on the behavior of output or employed generally small samples of countries over relatively short time periods.

There is of course a large 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 shocks for business cycles in emerging markets. Chang, Kaltani and Loayza (2009) 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 the dynamics of financial cycles in emerging markets.

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.⁴ Most studies are limited to a small number of countries and some other “case-type” studies of individual episodes. Some others focus specifically on the behavior of real and financial variables surrounding financial crises, notably Reinhart and Rogoff (2009). Building on earlier work in the context of advanced economies (Claessens, Kose, and Terrones, 2009), this paper documents the basic stylized facts of recessions and financial market disruptions in emerging markets.

³ Calderon and Fuentes (2006) consider a sample of 14 emerging market economies over 1980-2005. Gupta and Miniane (2009) provide an analysis of recessions and recoveries using quarterly data of eight emerging countries for the 1980-2008 period. du Plessis (2006) studies seven 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.

⁴ Claessens, Kose and Terrones (2010) provide a detailed analysis of business and financial cycles in advanced countries and 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. This section also studies the implications of recessions associated with credit crunches, equity price busts, and financial crises. In Section 4, we provide a brief discussion of the recessions and financial disruptions in Chile and a comparison of the Chilean specific episodes with those in other emerging markets. Section 5 concludes.

II. Database and Methodology

Country coverage

We employ a comprehensive database covering 23 emerging market countries and 21 OECD countries over the period 1978:1-2007:4. The emerging market countries in our sample are Argentina, 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.⁵ We compare the features of recessions and financial disruptions in emerging economies with those of advanced OECD countries. The advanced 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.⁶

⁵ 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, Hungary, Morocco, Pakistan, Poland, and Russia), while we include a number of other emerging markets (Costa Rica, Ecuador, Hong Kong, Singapore, and Venezuela). We provide detailed information about the database in Claessens, Kose, and Terrones (2010).

⁶ In Claessens, Kose, and Terrones (2010), we analyze the analysis of business and financial cycles in advanced countries for the period 1960:1-2007:4.

The emerging and advanced countries in our sample account collectively for more than 90 percent of global output. However, there are significant differences between the two groups. For example, per-capita income level is typically much lower in emerging markets, about one-third, than in the typical advanced country. In terms of overall economic size, total (US dollar) GDP is also lower for the typical emerging market. Relative to its size, however, the typical emerging market country in the sample trades more with the rest of the world than the typical advanced economy. Specifically, in 2005, the standard trade openness ratio (export plus imports as a share of GDP) for the emerging market group is close to 80 percent while it is about 50 percent for the advanced countries group. In contrast, in terms of financial linkages with the rest of the world, the advanced economies are definitely more integrated with the global financial markets than emerging countries are.

Macroeconomic and financial variables

Our analysis focuses on recessions and financial market disruptions, which dictates our data choices. Although our main database contains a large number of macroeconomic aggregates, we provide statistics here for only a smaller set for the sake of brevity. The quarterly time series of macroeconomic variables are seasonally adjusted, whenever necessary, and in constant prices. These series are collected from various sources, including IMF International Financial Statistics (IFS) and OECD. The financial variables we consider are credit and equity prices. Credit series are obtained from 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 (e.g., Mendoza and Terrones, 2008).⁷ Equity price indices are also from IFS and generally cover the main local stock

⁷ Many papers examine the behavior of aggregate credit measures during recessions or financial crises. Chari, Christiano and Kehoe (2008) and Cohen-Cole et al., (2008) highlight that it is important to go beyond aggregate measures (for example, differentiating credit to corporations from credit to households) to study the dynamics of credit markets especially in the context of the latest financial crisis in the United States. However, this is extremely difficult, if not impossible, to do in the context of our large cross-country coverage.

exchanges. All financial variables are converted into real terms using their country's respective consumer price indexes (CPI).⁸

Identifying turning points

Before analyzing recessions and their interactions with periods of financial stress, it is necessary to determine the dates of these various events. The methodology we employ focuses on changes in the levels of variables to identify cycles. This is consistent with the guiding principles of the National Bureau of Economic Research (NBER), which is the unofficial arbiter of U.S. business cycles. This methodology assumes that a recession begins just after the economy reaches a peak and ends as the economy reaches a trough. The methodology determines the peaks and troughs of any given series by first searching for maxima and minima over a given period of time. It then selects pairs of adjacent, locally absolute maxima and minima that meet certain censoring rules requiring a certain minimal duration of cycles and phases.

In particular, 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 cyclical turning points in the *log-level* of a series.⁹ 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:

⁸ Another major financial variable is the house price. However, house prices are available for only a small number of emerging market economies. Claessens, Kose, and Terrones (2009) provide an analysis of disruptions in housing markets using the data for advanced countries.

⁹ 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.

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

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 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.¹⁰ 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 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 equity 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 study 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

¹⁰ In the case of equity prices, the constraint that the contraction phase must last at least two quarters is ignored if the quarterly decline exceeds 20 percent because equity prices can display much intra-quarter variation leading to large differences between peaks and troughs.

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.¹¹ 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 one-eighth of all credit contractions or equity price busts.

How successful is our algorithm in replicating the well-known turning points of U.S. business cycles as determined by the NBER? Our algorithm replicates very well the dates of the NBER. According to the NBER, the U.S. experienced seven recessions over the 1960-2007 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.¹² The main features of our business

¹¹ In order to determine the credit crunch episodes, we use changes in the volume of (real) credit. In the literature, crunches are typically defined as excessive declines in the supply of credit that cannot be explained by cyclical changes in demand (see Bernanke and Lown, 1991). As one can easily recognize, 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 price 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.

¹² The differences between our turning points and those of the NBER are due to 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
(continued)

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 dating and -1.4 percent based on NBER dating.

III. Exploring the Downside of Fluctuations

III.1. Frequency and Synchronization of Recessions and Financial Disruptions

How many recessions and financial market disruptions did the emerging market and advanced economies experience over the period 1978-2007? In emerging market countries, we identify 84 output recessions (21 of which are severe), 102 credit contractions (25 crunches), and 139 declines (34 busts) in equity prices (see Figure 1). 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 for emerging markets often includes countries with shorter time-series than those for advanced countries, which is typically for the full period.

In terms of recessions and financial market disruptions, among the events we analyze, there is a considerable overlap: 14 and 25 recession episodes in emerging markets are associated with credit crunches and equity price busts, respectively. In other words, in about one in six recessions, there is also a credit crunch underway, and in about one in three 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, five were also credit crunches, 10 equity price busts, and of these, four were both credit crunches and equity price busts.

manufacturing and wholesale retail sectors), whereas we use only quarterly output series to identify cyclical turning points.

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, the first panel in Figure 2 shows the fraction over the period 1978:1-2007:4. Recessions in emerging markets do occur in bunches. The first synchronized recession episode is related to the debt crisis of the 1980s, where the frequency of recessions increases, first in 1982 and then again in the mid-1980s. Following this period, recessions are less common across emerging market 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 from recessions. There is another increase coinciding with the 2001 U.S. recession, when a noticeable number of emerging markets are in recessions.

We also consider the coincidence of contraction episodes in financial markets and their overlap with recessions (Figure 2, second and third panels). Equity prices exhibit the highest degree of synchronization, reflecting the extensive integration of stock markets around the world. More than half of the emerging markets tend to experience a sustained decline in equity prices during the highly synchronized episodes of equity market turbulence. Credit contractions are somewhat less synchronized across countries, but still there are eight years in which more than 40 percent 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 cannot infer causality here—nor for any other relationship we depicted: credit could be declining because of the recession or a decline in credit could be leading to the recession episode.

These findings echo the results reported by Claessens, Kose and Terrones (2009) in the context of advanced countries. In particular, they document that recessions in advanced countries are also highly synchronized events. They are bunched in four periods over the past 40 years—the

mid-1970s, the early 1980s, the early 1990s and the early 2000s—and often coincide with global shocks. Importantly, their findings suggest that globally synchronized recessions are longer and deeper than other recessions. Advanced countries also go through simultaneous episodes of credit contractions and declines in equity prices. Recessions tend to coincide with contractions in domestic credit and declines in equity prices in most advanced countries. Credit contractions, in particular, are closely associated with recessions. Equity prices exhibit the highest degree of synchronization, reflecting the extensive integration of equity markets across advanced economies.

III.2. Basic Features of Recessions

Intensity of recessions

Table 1A presents the main characteristics of the recessions in our sample of emerging markets and advanced countries. Since we are interested in the experience of the typical country, we most often focus on medians as they are less affected by the presence of outliers. However, we also report the averages and standard deviations measuring the dispersion in our sample. A typical emerging market country experienced about four recessions. There is no apparent pattern to the number of recessions across countries, although some regions do stand out. For example, the Asian emerging markets on average experienced just two recessions whereas the emerging economies in Latin America witnessed close to five episodes. The (median) number of recessions in a typical advanced economy is three, but the average is close to four. 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 country groups and regions.

A better metric to analyze the incidence of recessions is the proportion of time a country has been in a recession, simply defined as the fraction of quarters the economy is in a recession over the full sample period. According to this metric, the typical emerging market went through a period of contraction for less than 20 percent of the sample duration. Since this metric adjusts for the length of data series, we can compare across various regional and level of development

groups. The fraction of time spent in recession is typically 50 percent longer for Latin American emerging economies than for Asian emerging markets. In the case of advanced countries, the intensity measure is on average around 13 percent, which is much less than that of emerging markets.

Duration of recessions

There is no noticeable difference across emerging and advanced countries 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. In emerging markets, the shortest recession is (by definition) two quarters and the longest 13 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. The average duration of recessions does not differ much between emerging markets in Asia and Latin America.

Cost and violence of recessions

The median (average) decline in output from peak to trough, the recession's amplitude, is about 4.8 (6.5) percent in emerging markets. 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 typical recession in Asian emerging markets is two times less costly than that in Latin American ones. However, the amplitude of a typical emerging country recession is about three times larger than that of an advanced country.

The slope (violence) of a recession, defined as the ratio of its amplitude to duration, is typically also much larger in emerging economies than advanced countries, -1.2 versus -0.4, suggesting that recessions in emerging market countries are more violent macroeconomic events. Consistent with the findings for amplitudes, recessions in Asian emerging markets tend to be less violent than those in Latin America.

Recessions in emerging market countries 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). While the cumulative loss for a typical (median) recession is about 9 percent in emerging markets, the average loss is about 17 percent, showing that the distribution is very skewed to the right. The cumulative loss of a recession in Latin American emerging markets is two times larger than that in Asian ones.

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, 2006 and 2009). More importantly, they indicate that the downside of macroeconomic fluctuations in emerging market economies tends to be much sharper than those in advanced countries. 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 tend to worsen at a more rapid pace and become deeper than those in advanced countries. This is in part due to many recessions in emerging markets being accompanied by financial market disruptions.

Severe recessions

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. We present the main features of such episodes in Table 1B. While a number of emerging market countries 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 in our sample 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, the latter almost three times more costly than that of other recessions. These recessions are also more virulent, with a slope coefficient three times greater than that of other recessions. Tables 1a and 1b together suggest that, compared with advanced countries, the

typical recession in emerging economies is equivalent to a severe recession in advanced countries in terms of its amplitude and cumulative loss.

A further illustration of the distribution of recessions is provided in Figure 3. Most recessions in emerging markets last four quarters or less, and the overwhelming majority of these were mild to moderate in depth. Specifically, roughly 30 percent of all recessions last two quarters, 40 percent last three-four quarters, and 30 percent last five quarters or more. This figure also shows that the shorter recessions tend to be milder. Of the severe recessions, however, most lasted more than five quarters. To examine the changes in these features over time, we split our sample into two sub-periods: 1978-1992 and 1993-2007. Comparing the two sub-periods shows that, unlike the well-documented pattern of the Great Moderation of cycles in advanced countries up until the latest crisis, the depth and duration of recessions in emerging markets have not moderated over time.

III.3. Dynamics of Recessions

The dynamics of adjustment around recessions in emerging markets differ substantially from those in advanced countries. Figure 4 presents a comparison of the typical behavior 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 the peak to the trough of a recession is three times larger than that in advanced countries (10 percentage points vs. 3 percentage points). Industrial production also displays a much sharper decline in emerging markets relative to advanced countries.

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 after the beginning of recessions. 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. Credit slows down in advanced countries during recessions, but it contracts in emerging markets. Finally, equity prices tend to exhibit a much sharper decline

in emerging markets than in advanced countries during recessions. Almost all macroeconomic and financial variables thus exhibit much sharper adjustments during recessions in emerging markets than in advanced countries.

III.4. Downside of Fluctuations in Financial Markets

Next, we provide summary statistics about the episodes of credit contractions and equity price declines in emerging markets (Table 2). In terms of duration, episodes of credit contractions last longer than recessions do, slightly less than seven quarters. Equity price declines are slightly shorter, but with a median duration of six quarters, they are also longer than the typical recession. As we noted above, a credit crunch (equity price bust) is defined as a peak-to-trough contraction (decline) in credit (equity) which falls within the top quartile of all credit contractions (equity price declines). 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 fall of 37 (70) percent in equity prices. Credit crunches and equity price busts not only have greater amplitudes—by definition, but they also last longer than other credit contractions and equity price declines do, 11 versus five quarters and nine versus five quarters, respectively.

Although the duration of credit crunches in advanced countries is longer than that in emerging countries, crunches in advanced countries are much less intense 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. Consistent with 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.

Episodes of credit contractions and equity price declines are typically not associated with a drop in output. However, they do coincide with a significant decline in activity, when they take the forms of credit crunches. For example, output typically falls around 0.6 percent over the period of a crunch episode in emerging markets, while even during equity busts output registers positive

growth. Compared to emerging markets, financial market disruptions in advanced countries are associated with less adverse outcomes in the real economy.

III.5. Recessions and Financial Disruptions

What are the implications of recessions in emerging markets when they are accompanied by (severe) credit crunches, equity price busts, or financial crises? We now answer this question with a set of summary statistics reported in Table 3. When recessions are accompanied with disruptions in financial markets, they tend to be longer and deeper. To provide a sense of their distribution, we examine separately the features of recessions coinciding with severe episodes, i.e., the top 12.5 percent of all financial market disruptions. We also provide the summary statistics for these types of events in advanced countries to allow for comparisons.

There is a significantly larger output decline during recessions associated with a credit crunch compared to other recessions, 8.5 versus 5 percent. The cumulative output loss in recessions associated with (severe) crunches is often larger than in recessions without crunches. There are a number of statistically significant differences between recessions coinciding with equity price busts and those without. 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.

With respect to their duration, recessions with financial crises are generally as long as those associated with credit crunches and equity price busts. In terms of their amplitude, recessions 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. If we use the cumulative loss measure as the relevant metric, then recessions associated with equity busts are slightly more costly than those associated with credit crunches (-13.6 vs. -11.12 percent). The cumulative losses stemming from the recessions associated with crises are typically larger than those in recessions accompanied 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 accompanied with financial crises.

Recessions associated with equity price busts are much more costly events than those without equity busts for the sample of emerging markets. This is unlike the results for advanced countries. For example, Claessens, Kose, and Terrones (2009) report that, although recessions associated with equity price busts tend to be longer and deeper than those without equity busts in advanced countries, many of these differences are not statistically significant. This might reflect the fact that the link between equity price busts and developments in the real economy in advanced countries are 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 suggest that recessions associated with equity price busts probably coincide with severe disruptions in the real economy as well as the balance of payments.

IV. Recessions and Financial Disruptions: The Case of Chile

In light of the lessons from our broader analysis of the episodes of recessions and financial disruptions in emerging markets, we now turn our attention to the Chilean case. The broad overview of these episodes generally paints a grim picture about their adverse impact on the dynamics of growth and stability in emerging economies, especially when contrasted with the experiences of advanced countries. Some emerging markets have been quite successful, however, in either largely avoiding recessions and financial disruptions or managing their harmful effects when they nevertheless occur. These countries have been able to deliver persistently high growth while maintaining a stable economic environment. Chile occupies a special place among this elite group of emerging markets. But, Chile experienced its own recessions and financial market disruptions as well. How do the episodes in Chile compare with those in other emerging markets?

We first present our findings with respect to the main properties of Chilean recessions. We then discuss how the dynamics of recessions in Chile compare with those in other emerging market economies. We conclude the section with a brief summary of the episodes of credit contractions and equity market declines in Chile.

IV.1 A Brief Review of the Chilean Recessions

Identification of recessions in Chile

Using quarterly data, we identify three recessions over the period 1980:1-2007:4 in Chile: 1981:3-1982:4, 1990:1-1990:3, and 1989:2-1999:1 (Table 4 and Figure 5). The longest and deepest recession in Chile took place in the early 1980s and resulted in a significant decline in output over five quarters. The recession in the early 1990s was the shortest and mildest one, with decline in output of about 2.5 percent over two quarters. The recession in the late 1990s lasted three quarters and led to an output decline of roughly 4.6 percent.

The number and the dates of the Chilean recessions we document are mostly consistent with those in other studies using quarterly data. For example, Calderon and Fuentes (2006) also report that the Chilean economy witnessed three recessions over their sample of 1980-2005. Our findings with respect to the dates of recessions are also similar to some of the turning points identified in Mejia-Reyes (1999, 2004).¹³

Although the use of annual data can allow one to study the evolution of Chilean recessions over a longer period, this is not advisable for at least a couple of reasons. First, 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 quarterly declines in output that in turn

¹³ The former study uses annual data and documents three recessions (1953-1956, 1971-1976, and 1981-1983) over the period 1950-1995. The latter study considers the turning points in monthly industrial (or manufacturing) production index between years 1960-2001 and identifies four recession episodes: 1971:9-1975:8, 1980:12-1982:10, 1984:6-1985:5, 1989:12-1990:05.

lead to an outright contraction in annual series. In the case of Chile, for example, it is not possible to detect the early 1990s recession in annual data. In our broader sample of emerging markets, the number of recessions goes down to 67 (from 84), if one simply defines recessions as contractions in yearly output. Second, the use of annual data can distort the dating of recessions, even if the annual growth rate is negative in a particular year.¹⁴

Even with quarterly data, differences can arise because of varying data sources and frequency of data. Our main data source for the quarterly series of the Chilean macroeconomic and financial variables is the IMF IFS. We compare our cyclical turning points with those computed using data series from other sources, such as the Global Data Source and the Bank of Chile. We conclude that our findings are robust to the use of these alternative data sources. We also check whether there is contraction in not just GDP, but also other main indicators of activity, including industrial production, consumption, and investment, during the recessionary periods we identified. All of these variables also register negative growth rates during the recessions we determine, indicating as well that the dates we identify are “true” recessions reflecting significant decline in activity spread across multiple segments of the Chilean economy.¹⁵

¹⁴ For instance, the third recession in Chile begins in 1998:2 and ends in 1999:1. Since the growth rate of output is positive in 1998 and negative in 1999 in annual series, the date of the recession is incorrectly identified as 1999 using the annual data.

¹⁵ Some other studies examine the stylized facts of the Chilean business cycles using the filtered time-series. For example, Belaish and Soto (1998) study the characteristics of business cycles in Chile for 1986-1997 using the HP-filtered data. They report that the average business cycle in Chile lasts three years, half of it in the recession phase, and the other half in the expansion phase. Their findings indicate that the amplitude of the cycle is about 3 percent. Given the time-varying nature of the trends computed by the HP filter, it is hard to contrast their findings with those coming from the studies employing the classical methodology, such as ours.

What happened during recessions in Chile?

Recessions can be driven by a number of factors. Moreover, as the voluminous literature on the sources of business cycles has made clear, it can be hard to identify conclusively what are the most important causes for specific recession episodes. This observation also applies to the recessions experienced by Chile. Nevertheless, a review of the individual recession episodes along with the related literature can help clarify what factors may have been at play during these events.

The first Chilean recession we identify (1981:3-1982:4) coincided with the 1982 global recession where the world per capita GDP fell by around 1 percent (see Kose, Loungani, and Terrones, 2009). The recession in Chile resulted in significant decline in both output (20 percent) and industrial production (17 percent). This episode was also accompanied by an equity price bust and a disruption in credit markets. Although credit did expand over the course of the recession, it began contracting in 1982:2 as a major financial crisis occurred during that year.

Reflecting the simultaneously ongoing global recession, decline in demand was an important factor during the 1981-1982 recession. As a commodity export dependent economy, it meant a significant fall in demand for Chile's exports.¹⁶ There were other external factors as well: the tight monetary policies in several advanced economies, the rapid increase in oil prices, and the debt crisis experienced by a number of Latin American countries reduced the supply of external financing. Indeed, net private capital inflows to Chile registered a decline during this period (see IMF, 1983). Franken, Le Fort, and Parrado (2005) consequently argue that the recession resulted from a sudden stop in capital inflows coinciding with a deterioration of the terms of trade, a jump in the world interest rates, and the sharp adjustment in the real exchange rate.

¹⁶ Copper exports constitute a significant source of revenue for the Chilean economy. Spilimbergo (1999) and Caballero (2001) find a strong association between the price of copper and business cycles in Chile. De Gregorio (2009) claims that Chile does not share the curse of rich natural resources that often stunts the long-term economic growth in commodity dependent countries.

As documented in the literature, there were also various Chile-specific factors associated with this episode. First, in addition to the problems in international capital markets, the Chilean financial system was under stress as banks had taken excessive risk leading to a deterioration of their loan portfolios and eventually resulting in a full-blown banking crisis (see Larrain (1989) and Barandiaran and Hernandez (1999)). Second, as Edwards (1983) notes, the fixed exchange rate regime along with the rigid wage rate policy precluded any downward adjustment in real wages.¹⁷

The 1990:1-1990:3 recession coincided as well with a worldwide slowdown in activity, ahead of the 1991 global recession. The global recession reflected problems in various parts of the world: difficulties in the U.S. saving and loan industry, banking crises in several Scandinavian economies, an exchange rate crisis in a large number of European countries, the challenges faced by East European transition economies, and the uncertainty stemming from the Gulf War and the subsequent increase in the oil price. In Chile, the recession meant declines in investment, exports, and industrial production, and a slight increase in the unemployment rate. The Chilean financial markets went through a rough period as credit fell by 5 percent and the equity market declined by 9 percent.¹⁸

After the brief recession of the early 1990s, Chile registered strong economic growth until 1998. In fact, the growth averaged around 7 percent per year and per capita income doubled over the

¹⁷ For an extensive discussion of the developments prior to this episode and the associated banking crisis, see IMF (1982), Edwards (1983), Barandiaran and Hernandez (1999) and Franken, Le Fort, and Parrado (2005). Franken, Le Fort, and Parrado (2005) argue that the rapid increase in bank credit during the late 1970s and the early 1980s resulted in a severe deterioration of the quality of the loan portfolio and increased exposure to exchange rate movements. In a related paper, Barajas, Luna, and Retrepo (2007) investigate macroeconomic fluctuations and bank behavior in Chile between 1989 and 2006.

¹⁸ As De Gregorio (2009) notes there was political uncertainty in the early 1990s as it was a period of transition to democracy after the 1989 elections following 16 years of military regime.

period 1985-1998.¹⁹ The recession of 1998:2-1999:1 marked the end of Chile's "golden" period of growth, however (see De Gregorio, 2004). The main driving force behind the 1998-1999 recession were external developments, notably the Asian crisis in 1997 and the Russian crisis in 1998. The accompanying decline in copper prices led to a significant deterioration of Chile's terms of trade and a substantial decline in exports. The recession resulted in a GDP contraction of 4.6 percent along with sharp reductions in consumption and investment. Industrial production contracted and the unemployment rate increased. The equity market registered a substantial decline. Credit growth was muted over the course of the recession, in part because of an increase in the policy rates to stem the depreciation of the currency.²⁰

The brief review we present here thus consistently emphasizes the importance of external, and to a lesser degree domestic, factors in explaining the recessions in Chile. This confirms the findings of some earlier studies employing different methodologies to study the determinants of macroeconomic fluctuations for Chile. Franken, Le Fort and Parrado (2005), for example, examine how the Chilean business cycles respond to various shocks using a VAR model over the 1950-2003 period. They report that external shocks constitute the main source of business cycle fluctuations in Chile. In a related paper, Medina and Soto (2007) analyze the sources of business cycle fluctuations in Chile for the period 1987-2005 using a dynamic stochastic general equilibrium model. They conclude that both foreign and domestic supply shocks play important roles in accounting for output fluctuations whereas domestic demand shocks and terms of trade shocks tend to have relatively minor effects.

¹⁹ For a detailed analysis of the "golden period" of growth in Chile, see Gallego and Loayza (2002). They document that a significant part of growth was explained by the growth of total factor productivity after 1985, whereas before 1985, it was mostly due to labor growth.

²⁰ Franken, Le Fort, and Parrado (2005) argue that this recession could have been avoided if monetary policy did not overreact to limit the currency depreciation by narrowing the exchange rate band. At the end of the 1998, the copper price started to increase again, and with expansionary monetary and fiscal policies, the Chilean economy started to recover (IMF, 2000). Simonovska and Soderling (2008) examine the sources of business cycles in Chile using a DSGE model with time-varying frictions over 1998-2007. They conclude that changes in productivity and labor markets played important roles in explaining the 1998-1999 crisis.

How do the Chilean recessions compare with those in other emerging market economies? We conclude this sub-section by providing a short answer to this question. In terms of the number of episodes, Chile witnessed only three recessions whereas a typical emerging economy experienced four over the sample period we examined. However, the features of a typical Chilean recession are quite similar to those of emerging markets as the median amplitude of the three recessions Chile weathered is about 4.6 percent and the median duration about three quarters (Figure 6). The median decline in industrial production during the Chilean recessions, however, is roughly three times smaller than that in recessions in emerging markets. The recession of the early 1980s in Chile was a severe one though. Moreover, it was deeper than the typical severe recession in emerging market economies. Nevertheless, if one focuses on the last two recessions over the period 1980-2007, it is obvious that the Chilean economy experienced relatively milder episodes than the typical emerging market in our sample.

IV.2. Dynamics of Recessions in Chile

We next examine how various macroeconomic and financial variables behave around recessions in Chile and how the dynamics of Chilean recessions compare with those in other emerging market economies. We focus on patterns in year-on-year growth in each variable for a six-year window—12 quarters before and 12 quarters after a peak (Figure 7). We focus on year-on-year changes since quarter-to-quarter changes can be quite volatile. For comparison purposes, we include the median growth rates of the three recessions in Chile, and also those for all emerging markets, along with the top and bottom quartiles. The severe recessions are in the bottom quartile consistent with our earlier definition of these episodes.

The evolution of output growth in a typical recession in Chile is no different than the typical one in other emerging markets. Following the peak at date 0, output tends to register negative annual growth after two quarters, going down to -4 percent four quarters after the peak. Relative to the typical emerging market recession, however, investment registers a much sharper decline in the first year of a recession in Chile. Moreover, the contraction in investment is deeper than that in output and lasts longer. In severe recessions, it can take up to three years for investment growth

to recover. Industrial production in Chile also typically registers a sharp decline, however, the contraction is milder than that typical in emerging markets.

Net exports improve sharply in the first year of a typical Chilean recession. The bounce in net exports in Chile is much larger than that observed in emerging market economies. The growth rate of exports slows but often stays positive in emerging markets. Import growth, however, often falls with the beginning of the recession and can decline to -10 percent in the first year of a recession.

Recessions in Chile appear to feature more significant declines in credit growth and equity prices than those in emerging market economies. In a typical emerging market recession, credit growth slows down sharply at the beginning, and then contracts by about 2 percent in the first year of a recession. The growth rate of credit typically does not return to pre-recession growth rates for a number of quarters. Recessions in Chile and other emerging markets 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 ahead of the trough of the business cycle.

IV.3. Financial Disruptions in Chile

Next, we provide summary statistics regarding the episodes of credit contractions and equity price declines in Chile, again comparing them with those in other emerging markets (Tables 5 and 6). We identify three credit contraction episodes in Chile. The first and third of these episodes coincide with the early 1980s and the early 1990s recession. The first one is also accompanied by a financial crisis. In terms of duration, a typical credit contraction episode in Chile lasts two times longer than a typical recession does, six quarters vs. three quarters. In terms of amplitude, a typical credit decline in Chile is about 11 percent.

The growth of economic activity, measured by output or industrial production, slows down, especially early on in a credit contraction episode, but the level of activity typically is higher at the end than at the beginning of these episodes. The increase in output over the course of a credit contraction is not surprising since these episodes do not always fully overlap with recessions and anyhow last twice as long as recessions do. Although Chile did not experience a credit crunch episode during the time period we examine, the typical credit decline episode in Chile was quite similar to the one in emerging markets in terms of duration, amplitude and slope (see Figure 6). However, the Chilean economy tends to perform better than the typical emerging market during credit contractions as evidenced by much higher growth rates of output and industrial production.

In terms of equity price declines, Chile experienced eight episodes over the period 1980-2007, slightly more than other emerging market economies (six). Some of the emerging market economies, however, have shorter equity price series than has Chile. The declines last between two and 13 quarters in Chile. The episodes of equity price declines typically last shorter than credit contractions do, but are still slightly longer than recessions. A typical decline episode in Chile leads to a fall of around 14 percent in equity prices which is less than half of the amplitude of a decline in such episodes in emerging markets.

Chile witnessed two equity busts over the sample period under consideration: the first one was during the recession of the early 1980s, and resulted in around 70 percent decline in equity price. The second one was in the mid-1990s, and was associated with the Asian crisis. Equity price busts not only have greater amplitudes—by definition, but they also last longer than credit contractions and equity price declines. While output in Chile rarely registered negative growth over the course of a typical equity price decline, industrial production tends to fall in most episodes. The episodes of equity prices declines in Chile are more muted relative to those in other emerging markets, but they are associated with somewhat weaker growth as well.

VI. Conclusions

We provide a brief overview of the macroeconomic implications of recessions and financial disruptions in emerging market economies. In order to undertake this exercise, we utilize a rich dataset of business and financial cycles based on reasonably long quarterly time-series of multiple measures of real and financial activity. Our dataset covers a large number of advanced and emerging market countries allowing us to compare the features of these episodes in the two groups. Although our objective is to present an overview, we attempt to answer three specific questions.

First, what are the main features of recessions and financial disruptions in emerging markets? A typical emerging market country experiences about four recessions. The fraction of time spent in recession is typically 50 percent longer for Latin American emerging economies than for Asian emerging markets. In the case of advanced countries, the same statistic is on average about 13 percent, which is much less than that of emerging markets. Output declines by about 5 percent in a recession in emerging market economies with substantial differences across regions. For example, the typical recession in Latin American emerging markets is two times more costly than that in Asian ones.

Recessions in emerging markets tend to be deeper than those in advanced countries with the amplitude of a typical emerging country recession about three times larger than that of an advanced country. Our findings suggest that the typical recession in emerging economies is equivalent to a severe recession in advanced countries in terms of its amplitude and cumulative loss. The dynamics of adjustment around recessions in emerging markets also differ substantially from those in advanced countries. These findings confirm the results of a number of earlier studies about the more volatile nature of business cycles in emerging markets.

Financial market disruptions in emerging markets are also more severe than those in advanced countries. Although credit crunches in advanced countries last longer than those in emerging countries, crunches in advanced countries are much less intense. 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.

Second, how synchronized are these events across emerging markets? Our results suggest that recessions in emerging markets are highly synchronized events. Financial disruptions can be synchronous as well. In particular, equity prices exhibit the highest degree of synchronization, reflecting the extensive integration of stock markets around the world. Credit contractions are somewhat less synchronized across countries, but still there are eight years in which more than 40 percent 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. These findings are similar to the earlier results reported in the context of advanced economies.

Third, how does the coincidence between recessions and financial disruptions affect macroeconomic outcomes? When recessions are accompanied with disruptions in financial markets, they tend to be longer and deeper. In particular, recessions associated with credit crunches appear to be more costly than recessions with equity price busts in terms of amplitude, while recessions associated with financial crises are about as costly.

In light of these general observations, we also ask whether the Chilean recessions and financial disruptions are different than those of other emerging markets. Chile witnessed three recessions whereas a typical emerging economy experienced four over the sample period we examine. Taken into account the small number of observations we have for Chile, we reach three tentative conclusions: First, the features of a typical Chilean recession are quite similar to those of emerging markets. Second, the dynamics of output around recessions in Chile are also similar to those of other emerging markets. However, if one excludes the very severe recession of the early 1980s and simply focuses on the last two recessions prior to 2008, the Chilean economy appears to experience relatively milder episodes than the typical emerging market in our sample. Third,

while the episodes of credit declines in Chile are quite similar to those in emerging markets in terms of their duration, amplitude and slope, the Chilean economy tends to perform better than its peers during such episodes. In contrast to the credit contractions, the episodes of equity price declines in Chile are more muted relative to those in other emerging markets, but they are associated with somewhat weaker growth.

Consistent with its historical record presented here, Chile performed better than most other emerging market economies during the 2008-2009 global financial crisis. Recent studies point to a number of factors that can explain Chile's performance over the past two years.²¹ First, the macroeconomic and financial policies employed by Chile were sound and effective. For example, its fiscal policy was well-positioned to stimulate the economy and its financial system was well-capitalized under rigorous supervision. Second, the commodity boom prior to the crisis resulted in large dividends for Chile. Third, exchange rate policies were instrumental in stabilizing foreign capital movements.

Our preliminary investigation has just scratched the surface of the complex linkages between recessions and financial disruptions in emerging market economies. There are a number of issues to be explored in future research. One additional approach to shed more light on these linkages would be to use individual firm data for a large sample of countries. Another fruitful area is to examine the nature underlying shocks leading to differences in the features of recessions and financial disruptions in emerging markets and advanced countries.

²¹ De Gregorio (2009), IMF (2008), Ocampo (2009), Garcia (2009), Jara, Moreno, and Tovar (2009), and Blanchard, Faruquee, and Das (2010) examine various aspects of the Chile's macroeconomic performance during the global financial crisis.

References

- Aghion, Philippe, Philippe Bacchetta, and Abhijit Banerjee, 2001, "Currency crises and monetary policy in an economy with credit constraints," *European Economic Review*, Elsevier, Vol.45, No.7, pp. 1121–50.
- Artis, M. John, Zenon G. Kontolemis, and Denise R. Osborn, 1997, "Business cycles for G7 and European countries," *Journal of Business*, Vol.70, pp. 249–79.
- Barajas, Adolfo, Leonardo Luna, and Jorge E. Retrepo, 2007, "Macroeconomic Fluctuations and Bank Behavior in Chile," Central Bank of Chile, Working Paper, No. 436.
- Barandiaran, Edgardo, and Leonardo Hernandez, 1999, "Origins and Resolutions of a Banking Crisis: Chile 1982–86," Central Bank of Chile, Working Paper, No. 57.
- Barro, Robert J, and Jose F. Ursua, 2008, "Macroeconomic Crises since 1870," *Brookings Papers on Economic Activity*, 2008, Vol.1, pp. 255–350.
- Belaish, Agnes, and Claudio Soto, 1998, "Empirical Regularities of Chilean Business Cycles," Central Bank of Chile.
- Bernanke, Ben and Mark Gertler, 1989, "Agency Costs, Net Worth, and Business Fluctuations," *American Economic Review* Vol. 79, pp. 14–31.
- Bernanke, Ben, Mark Gertler, and Simon Gilchrist, 1996, "The Financial Accelerator and the Flight to Quality," *The Review of Economics and Statistics*, Vol. 78, No. 1, (Feb.), pp.1-15.
- _____, 1999, "The Financial Accelerator in a Quantitative Business Cycle Framework," in *Handbook of Macroeconomics*, Vol. 1C, *Handbooks in Economics*, Vol. 15. Amsterdam: Elsevier, pp. 1341–93.
- Bernanke, Ben, and Cara S. Lown, 1991, "The Credit Crunch," *Brookings Papers on Economic Activity*, Vol. 2, pp. 205–47.
- Blanchard, Olivier, Hamid Faruquee, Mitali Das, 2010, "The Initial Impact of the Crisis on Emerging Market Countries," Preliminary.
- Borio, Claudio, Craig Furfine, and Philip Lowe, 2001, "Procyclicality of Financial Systems and Financial Stability," *BIS Papers* No.1 (Basel, Switzerland: Bank for International Settlements).

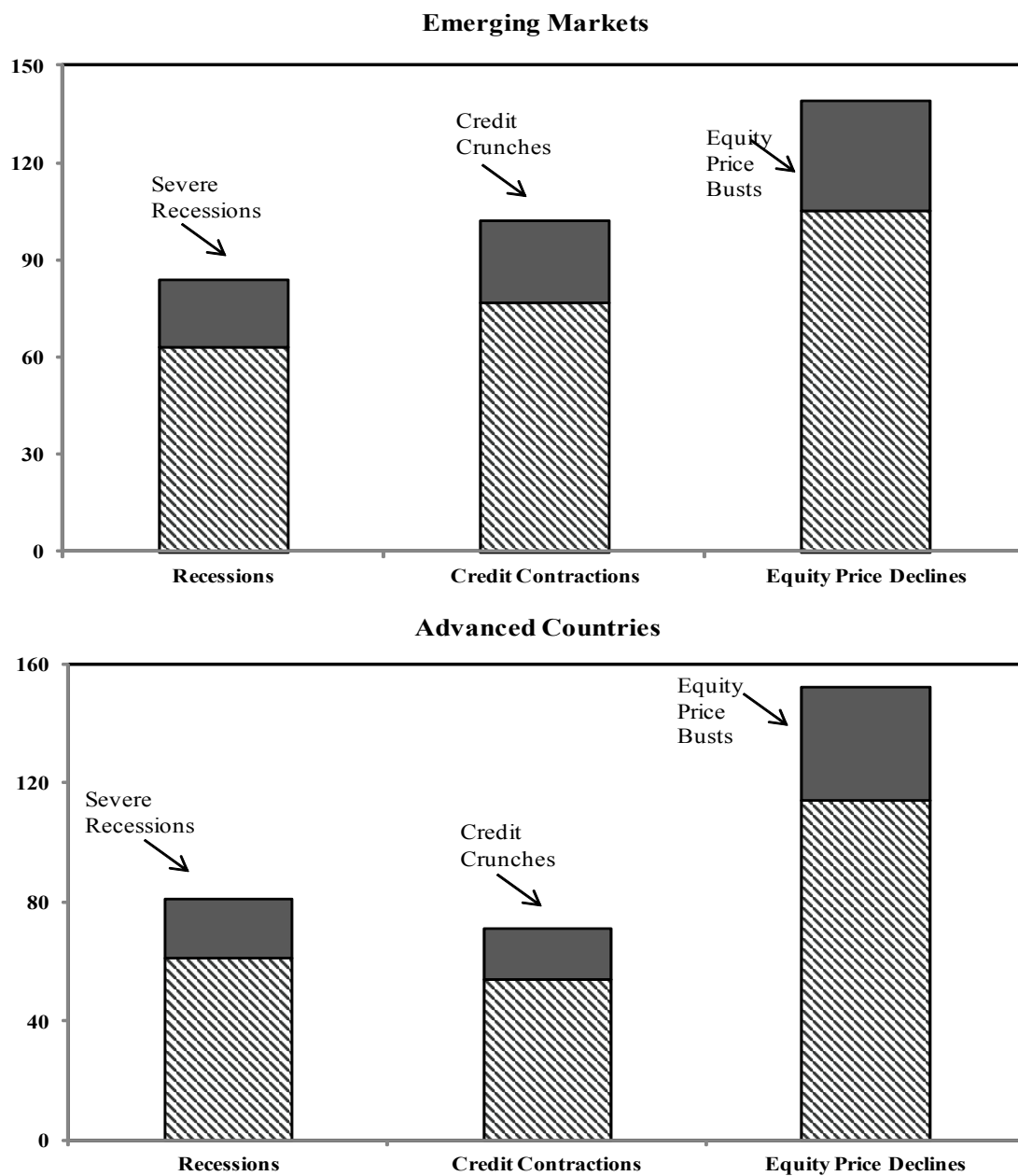
- Bry, Gerhard and Charlotte Boschan, 1971, "Cyclical Analysis of Time Series: Selected Procedures and Computer Programs," NBER. (New York: National Bureau of Economic Research).
- Burns, Arthur F., and Wesley C. Mitchell, 1946, "Measuring Business Cycles," NBER. (New York: National Bureau of Economic Research).
- Caballero, Ricardo J., 2001, "Macroeconomic volatility in Latin America: a view and three case studies," *Estudios de Economía*, University of Chile, Department of Economics, Vol. 28(1 Year 20), pp. 5–52, June.
- Caballero, Ricardo, and Arvind Krishnamurthy, 1998. "Emerging Market Crises: An Asset Markets Perspective," Working papers, No. 98-18, Massachusetts Institute of Technology (MIT), Department of Economics.
- Calderon, Cesar, and Rodrigo Fuentes, 2006, "Characterizing the Business Cycles of Emerging Economies," Centre for Economic Policy Research, London, United Kingdom.
- Céspedes, Luis Felipe, Roberto Chang, and Andrés Velasco, 2004. "Balance Sheets and Exchange Rate Policy," *American Economic Review*, American Economic Association, Vol. 94, No.4, pp. 1183–93, September.
- Chari, V.V., Lawrence Christiano, and Patrick J. Kehoe, 2008, "Facts and Myths about the Financial Crisis of 2008," Federal Reserve Bank of Minneapolis, Research Department, Working Paper No. 666.
- Claessens, Stijn, M. Ayhan Kose, and Marco Terrones, 2009, "What Happens During Recessions, Crunches, and Busts?" *Economic Policy*, October, pp. 653–700.
- Claessens, Stijn, M. Ayhan Kose, and Marco Terrones, 2010, "Recessions and Financial Disruptions in Emerging Markets," forthcoming.
- Cohen-Cole, Ethan, Burcu Duygan-Bump, José Fillat, and Judit Montoriol-Garriga, 2008, "Looking Behind the Aggregates: A Reply to .Facts and Myths about the Financial Crisis of 2008," QAU Working Paper No. QAU08-5, Federal Reserve Bank of Boston.
- Edwards, Sebastian, 1983, "Stabilization with Liberalization: An Evaluation of Ten Years of Chile's Experiment with Free Market Policies, 1973–1983," UCLA Working Paper, No. 309.

- Fisher, Irving, 1933, “The Debt-Deflation Theory of Great Depressions,” *Econometrica*, Vol.1, October, pp. 337–57.
- Franken, Helmut, Guillermo Le Fort, and Eric Parrado, 2005, “Business Cycle Dynamics and Shock Resilience in Chile,” Central Bank of Chile, Working Papers, No. 331.
- Gallego, Francisco, and Norman Loayza, 2002, “The Golden Period for Growth in Chile: Explanations and Forecasts,” Central Bank of Chile, Working Paper, No. 146.
- Garcia, Pablo S., 2009, “Financial Turmoil, Illiquidity, and the Policy Response: The Case of Chile,” Central Bank of Chile, Economic Policy Papers, No. 29.
- Gregorio De, Jose, 2004, “Economic Growth in Chile: Evidence, Sources, and Prospects,” Central Bank of Chile.
- _____, 2009, “Economic Growth in Chile and Copper,” speech presented at the CESCO conference, September.
- Gupta, Souvik, and Jacques Miniane, 2009, “Recessions and Recoveries in Asia: What can the past teach us about the present recession?” *Asia Regional Economic Outlook*, May, pp. 29–41.
- Hamilton, James, 2003, Comment on “A comparison of two business cycle dating methods” *Journal of Economic Dynamics and Control*, Vol. 27, No. 9, pp. 1691–93.
- Harding, Don and Adrian Pagan, 2002a, “Dissecting the Cycle: A Methodological Investigation,” *Journal of Monetary Economics* Vol. 49, pp. 365–81.
- _____, 2002b, “A Comparison of two Business Cycle Dating Methods,” *Journal of Economics Dynamics and Control*, Vol. 27, pp. 1681–1690.
- Hong, Kiseok, John-Wha Lee, and Hsia Chink Tang, 2009, “Crises in Asia: Historical Perspectives and Implications,” *Journal of Asian Economies*, Vol.21, Issue 3, pp. 265–79.
- International Monetary Fund, 1982, Article IV Consultation—Staff Report, IMF Country Report No. EBS.82/227. (International Monetary Fund: Washington, DC).
- _____, 1983, Chile, Article IV Consultation—Staff Report, IMF Country Report No. EBS.84/50. (International Monetary Fund: Washington, DC).

- _____, 2000, Chile, Article IV Consultation—Staff Report, IMF Country Report No. SM 00/116. (International Monetary Fund: Washington, DC).
- _____, 2008, Chile: Selected Issues, the Western Hemisphere Department. IMF Country Report No. 08/239. (International Monetary Fund: Washington, DC).
- Jara, Alejandro, Ramon Moreno, and Camilo E. Tovar, 2009, “The Global Crisis, and Latin America: Financial Impacts and Policy Responses,” *BIS Quarterly Review*, June.
- Kashyap, Anil K and Jeremy C. Stein, 2000, “What Do a Million Observations on Banks Say about the Transmission of Monetary Policy?” *American Economic Review*, 90, June, pp. 407–428.
- Kose, M. Ayhan, 2002, “Explaining business cycles in small open economies: 'How much do world prices matter?'” *Journal of International Economics*, Elsevier, Vol.56, No.2, pp. 299–327, March.
- Kose, M. Ayhan, Prakash Loungani and Marco E. Terrones, 2009, “Out of the Ballpark” *Finance & Development*, 25-28, June.
- Kose, M. Ayhan, Eswar S. Prasad, and Marco E. Terrones, 2003, “How Does Globalization Affect the Synchronization of Business Cycles?” *American Economic Review, Papers and Proceedings*, Vol. 93, pp.57–62.
- _____, 2006, “How do trade and financial integration affect the relationship between growth and volatility?” *Journal of International Economics*, Vol. 69, pp. 176-202.
- _____, 2009. “Does Financial Globalization Promote Risk Sharing?” *Journal of Development Economics*, Vol. 89, 258-270.
- Krugman, Paul, 1999, “Balance sheets, the transfer problem, and financial crises,” *International Tax and Public Finance*, Vol. 6, 459-472.
- Laeven, Luc, and Fabien Valencia, 2008, “Systemic Banking Crises: A New Database,” IMF Working Paper, No. 08/224. (International Monetary Fund: Washington, DC).
- Larraín, Mauricio, 1989, “How the 1981-83 Chilean Banking Crisis was Handled,” Policy Working Paper, No. 300, Development Economics, The World Bank, December.

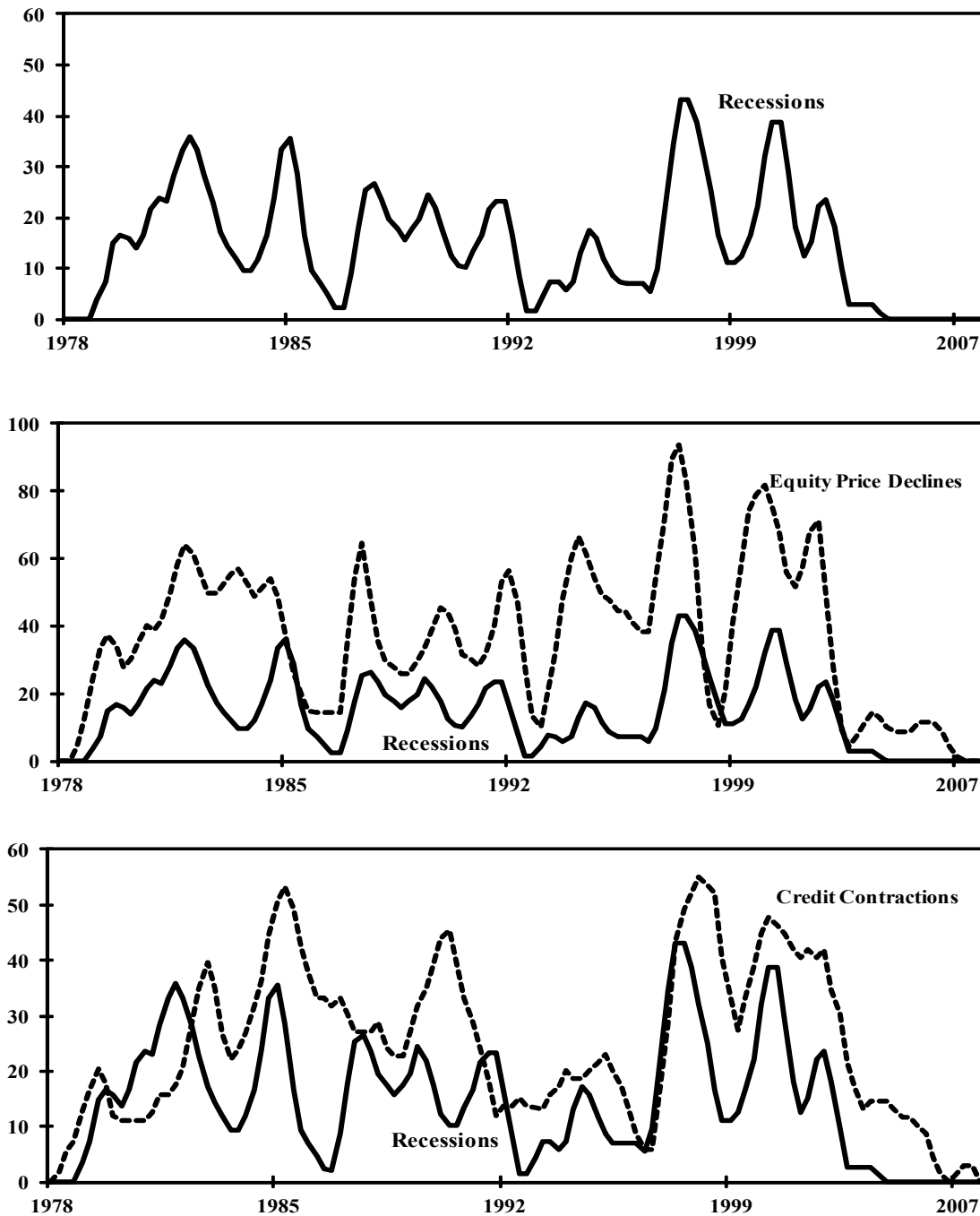
- Medina, Juan Pablo, and Claudio Soto, 2007, "The Chilean Business Cycles Through the Lens of a Stochastic General Equilibrium Model," Central Bank of Chile, Working Papers, No. 457.
- Mejia-Reyes, Pablo, 1999, "Classical Business Cycles in Latin America: turning points, asymmetries, and international synchronization," *Estudios Economicos*, Vol. 14, pp. 265-97.
- , 2004, "Classical Business Cycles in America: Are National Business Cycles Synchronized?," *International Journal of Applied Econometrics and Quantitative Studies*, Vol.1–3, pp. 75–102.
- Mendoza, Enrique G., 2010, "Sudden Stops, Financial Crises and Leverage," forthcoming, *American Economic Review*.
- Mendoza, Enrique and Marco E. Terrones, 2008, "An Anatomy of Credit Booms: Evidence from Macro Aggregates and Micro Data," NBER Working Paper No. 14049 (Cambridge, MA: National Bureau of Economic Research).
- Neumeyer, Pablo A., and Fabrizio Perri, 2005. "Business cycles in emerging economies: the role of interest rates," *Journal of Monetary Economics*, Elsevier, Vol. 52, No.2, pp. 345–80, March.
- Plessis du, Stan, 2006, "Business Cycles in Emerging market Economies: A New View of the Stylized Facts," Working Papers, No.02/2006, Stellenbosch University, Department of Economics.
- Reinhart, Carmen, and Kenneth Rogoff, 2009, "The Aftermath of Financial Crises," *American Economic Review Papers and Proceedings*, Vol. 99, pp. 466–72.
- Schneider, Martin, and Aaron Tornell, 2004, "Balance Sheet Effects, Bailout Guarantees and Financial Crises," *Review of Economic Studies*, Blackwell Publishing, Vol. 71, pp. 883-913.
- Simonovska, Ina, and Ludvig Soderling, 2008, "Business Cycle Accounting For Chile," IMF Working Paper, No. 08/61. (International Monetary Fund: Washington, DC).
- Spilimbergo, Antonio, 1999, "Copper and the Chilean Economy, 1960-98," IMF Working Paper, No. 99/57. (International Monetary Fund: Washington, DC).

Figure 1. Number of Recessions and Financial Disruptions
(number of events)



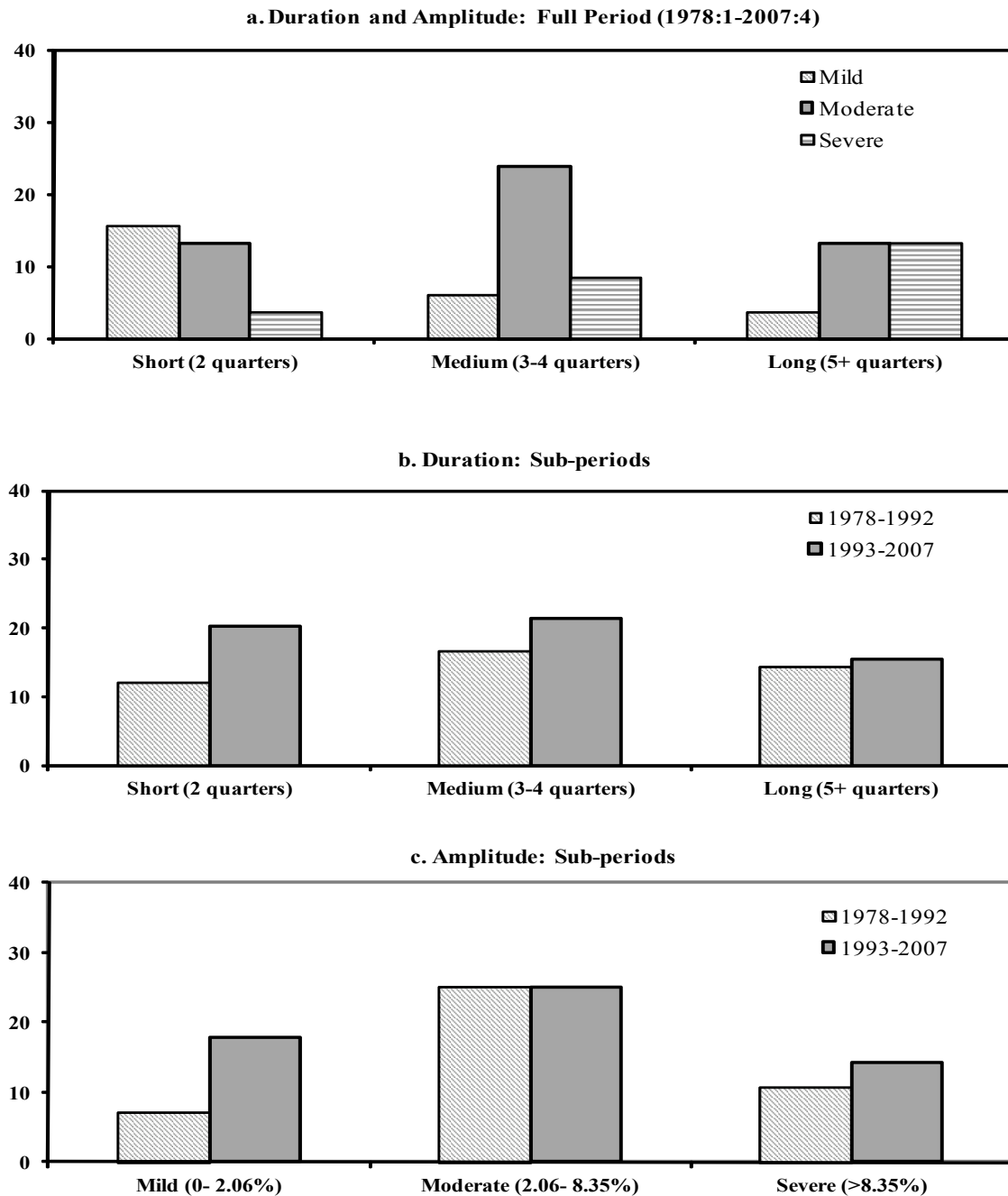
Notes: Each bar refers to the total number of the respective event. Severe recessions are those in which the peak-to-trough decline in output is in the top 25 percent of all recession-related output declines within respective group. Credit crunches and asset price busts correspond to peak-to-trough declines in credit and asset prices that are in the top 25 percent of all episodes of credit contractions and asset price declines, respectively.

Figure 2. Synchronization of Recessions and Financial Disruptions
(in percent of number of emerging markets)



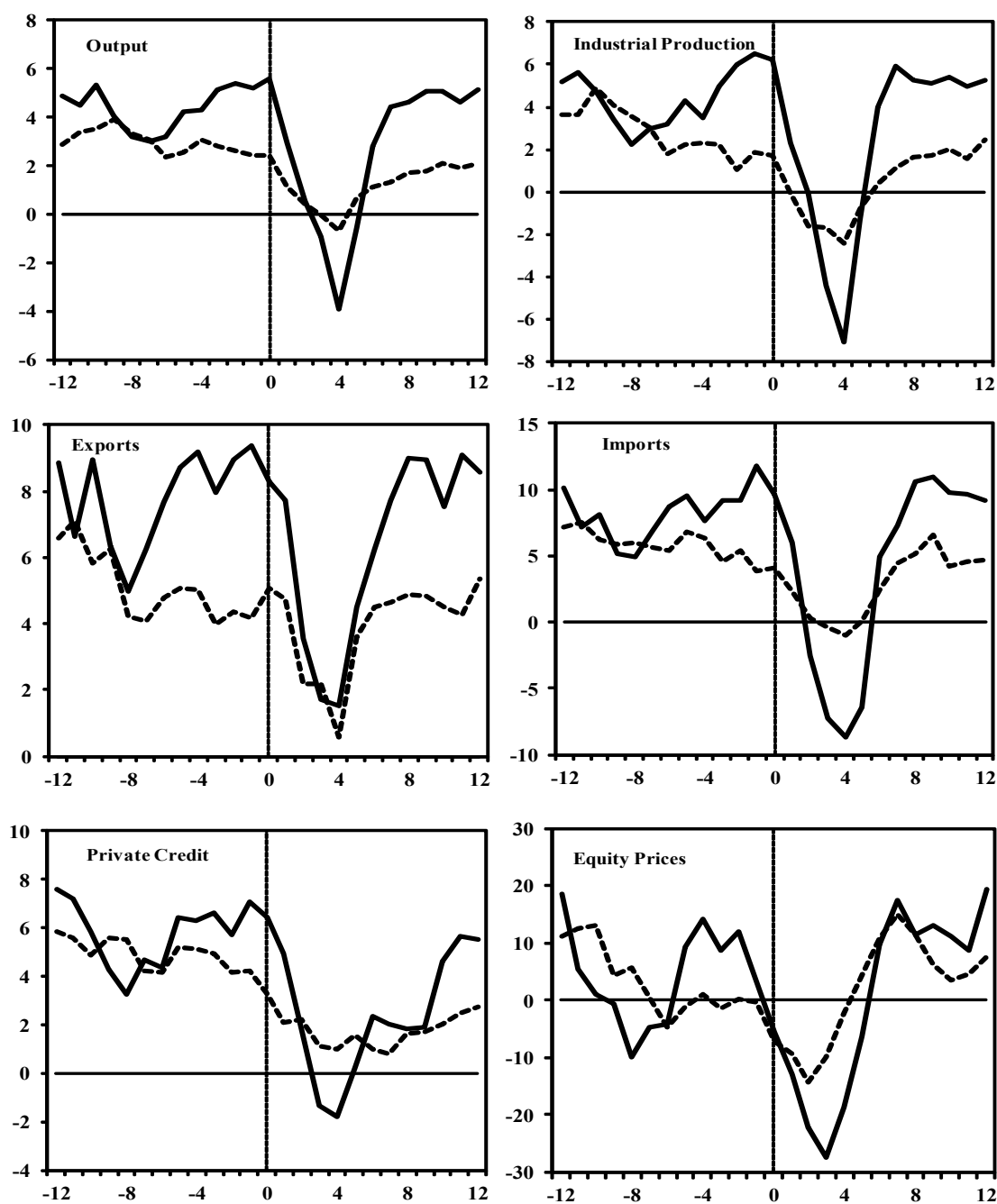
Notes: Each line refers to the share of emerging market countries experiencing recessions, episodes of credit contractions and/or equity price declines.

Figure 3. Recessions in Emerging Markets: Duration and Amplitude
(in percent of total number of recessions)



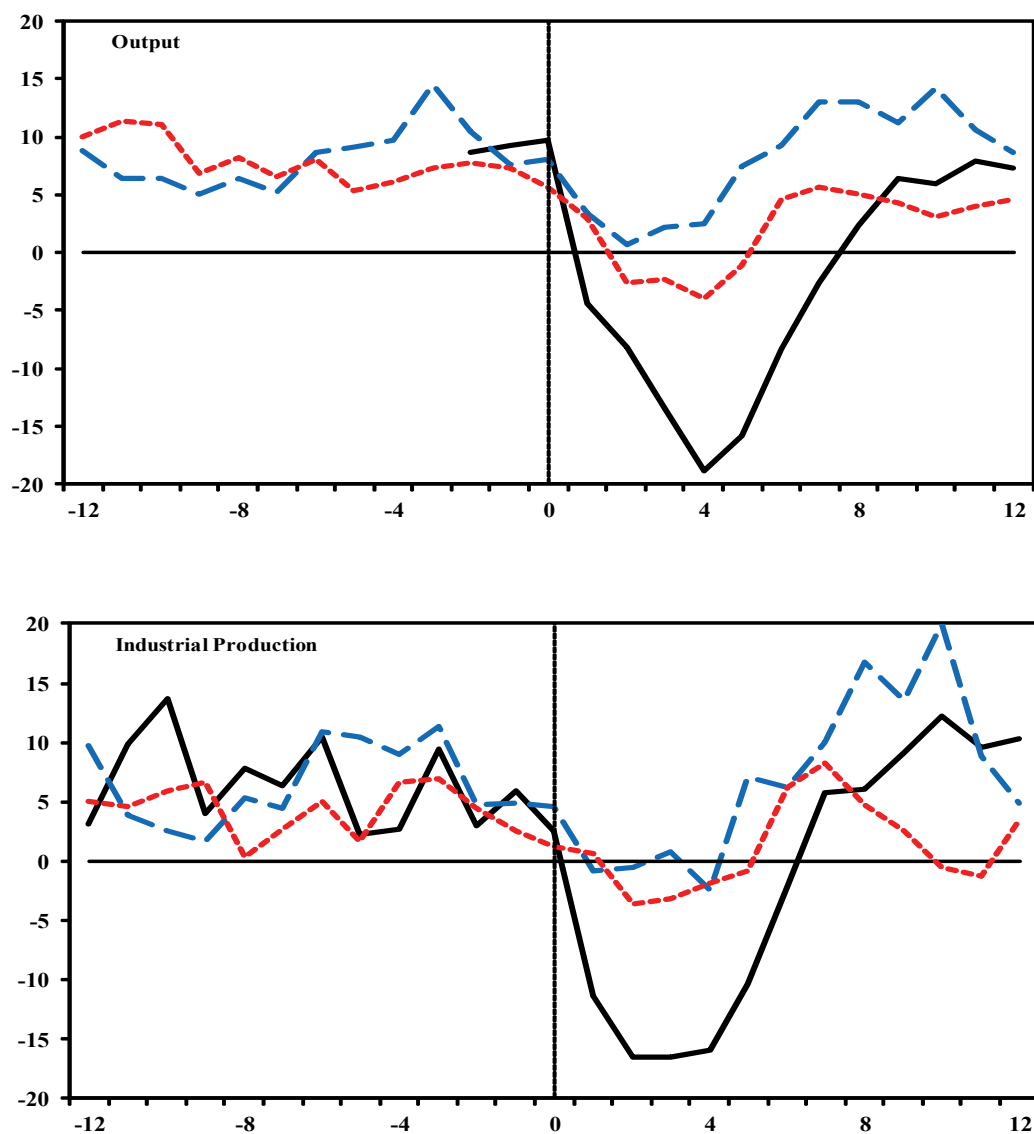
Notes: Each bar refers to the share of recessions in a particular category. Duration is the number of quarters from a peak to the trough of a recession. Amplitude is the percent change in output from a peak to the trough of a recession.

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)



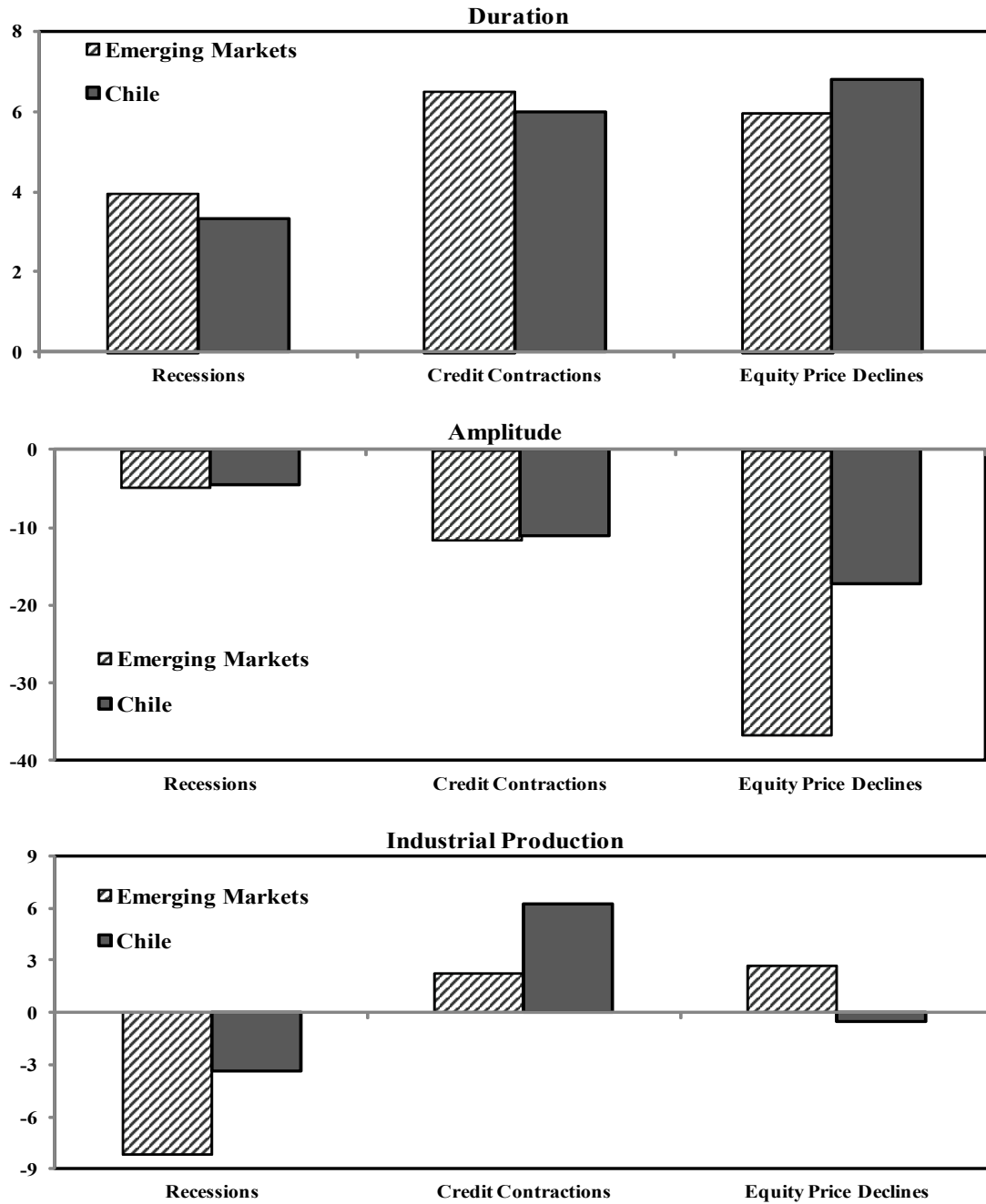
Notes: The solid line denotes the median of all observations for emerging market countries while the dotted line corresponds to the median of all observations for advanced countries. Zero is the quarter after which a recession begins (peak in the level of output).

Figure 5. Recessions in Chile: Output and Industrial Production
(percentage change from a year earlier unless otherwise noted; zero denotes peak; x-axis in quarters)



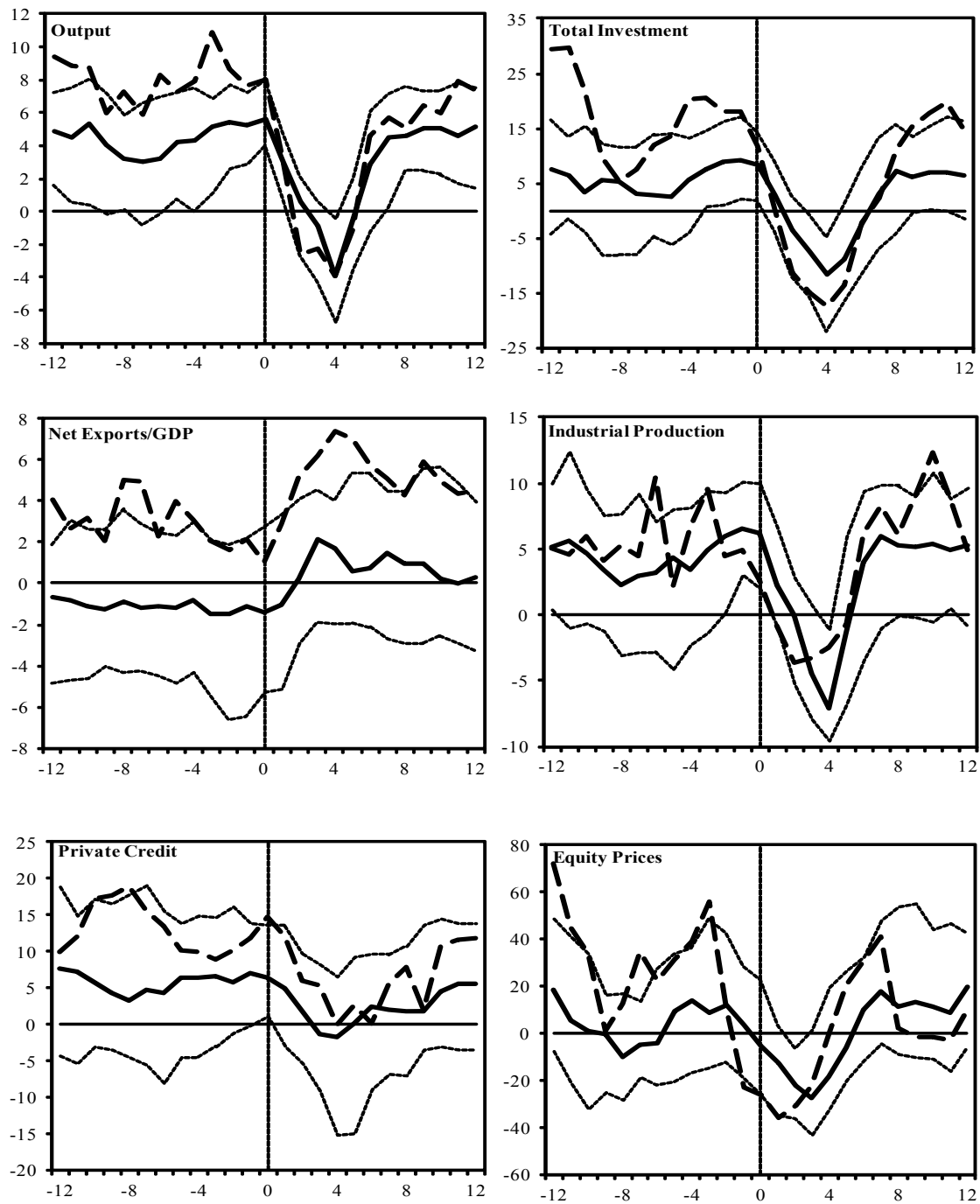
Notes: The solid line is associated with 1981 recession, the dashed line is the 1990 recession, and the dotted line is the 1998 recession. Zero is the quarter after which a recession begins (peak in the level of output).

Figure 6. Recessions and Financial Disruptions: Chile and Emerging Market Countries



Notes: Duration is the mean of number of quarters in recessions, credit contractions or equity price declines. Amplitude is the median change in output, credit, and equity prices during recessions, credit contractions and equity price declines, respectively. The bottom panel presents the median change in industrial production during recessions, credit contractions and equity price declines.

Figure 7. Dynamics of Recessions in Emerging Market Countries and Chile
(Percent change from a year earlier; zero denotes peak; x-axis quarter)



Notes: The dashed line denotes the median of all Chilean observations. The thick line denotes the median of all observations of emerging market countries, while the thin dotted lines correspond to upper and lower quartiles. The ratio of net exports/GDP is the level in percent.

Table 1A. Recessions: Basic Features

Country Groups	Number of Recessions	Duration	Proportion of time in Recession	Amplitude	Slope	Cumulative Loss
Emerging Market Countries						
Median	4.00	3.00	0.19	-4.81	-1.24	-8.93
Mean	4.00	3.92	0.19	-6.54	-1.69	-17.08
Standard Deviation	2.18	2.10	0.08	6.46	1.60	27.88
Asia						
Median	2.00	3.00	0.12	-2.73	-1.12	-4.22
Mean	2.88	3.65	0.12	-5.27	-1.33	-13.85
Standard Deviation	1.54	2.01	0.05	5.37	1.02	21.35
Latin America						
Median	4.50	3.00	0.25	-5.41	-1.59	-9.26
Mean	4.80	3.79	0.23	-7.13	-1.89	-16.37
Standard Deviation	2.48	1.77	0.08	6.90	1.78	21.73
Others						
Median	5.00	5.00	0.21	-4.88	-1.07	-11.17
Mean	4.33	4.85	0.20	-6.57	-1.60	-25.42
Standard Deviation	0.94	3.08	0.03	6.68	1.71	50.92
Advanced Countries						
Median	3.00	3.00	0.13	-1.72	-0.43	-2.74
Mean	3.86	3.73	0.13	-2.22	-0.60	-6.12
Standard Deviation	1.52	2.09	0.04	2.23	0.62	12.59

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.

Table 1B. Severe Recessions: Basic Features

Country Groups	Number of Severe Recessions	Duration	Amplitude	Slope	Cumulative Loss
Emerging Countries					
Median	1.00	5.00	▼ -12.73	-3.70	-27.16
Mean	1.40	4.86	▼ -15.64	-3.67	-46.67
Standard Deviation	0.83	2.13	▼ 6.43	1.97	42.81
Asia					
Median	1.00	5.00	-13.14	-2.43	-38.24
Mean	1.00	5.50	-13.16	-2.63	-41.60
Standard Deviation	0.00	2.51	4.07	0.89	26.62
Latin America					
Median	1.00	4.50	-13.93	-3.76	-30.57
Mean	1.71	4.67	-16.79	-4.07	-41.91
Standard Deviation	1.11	1.97	6.98	2.26	29.54
Others					
Median	1.50	4.00	▼ -12.73	-3.70	-25.32
Mean	1.50	4.33	▼ -15.98	-4.13	-75.85
Standard Deviation	0.71	2.52	▼ 8.78	2.05	101.31
Advanced Countries					
Median	1.50	5.00	-4.54	-0.74	-11.07
Mean	2.00	5.45	-5.19	-1.22	-17.65
Standard Deviation	1.41	3.03	2.61	0.96	21.65

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. Duration is the number of quarters between a peak and the next trough of a recession. 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.

Table 2. Credit Contractions and Equity Price Declines*(Percent change unless otherwise indicated)*

Events	Duration (Mean)	Amplitude (Median)	Slope (Median)	Output (Median)
Emerging Market Countries				
Credit Contractions	6.48	-11.62	-1.86	1.93
Credit Crunches	11.32***	-49.98***	-5.55***	-0.62*
Other Credit Contractions	4.91	-7.29	-1.51	2.94
Equity Price Declines	5.93	-36.63	-6.29	3.47
Equity Price Busts	9.44***	-68.79***	-9.03***	1.91
Other Equity Price Declines	4.79	-30.15	-6.03	3.48
Advanced Countries				
Credit Contractions	6.03	-3.64	-0.85	1.42
Credit Crunches	12.29***	-13.06***	-1.39***	4.18***
Other Credit Contractions	4.06	-2.74	-0.64	1.13
Equity Price Declines	5.38	-22.54	-4.55	2.71
Equity Price Busts	8.68***	-45.81***	-5.6***	2.89
Other Equity Price Declines	4.27	-17.96	-3.85	2.47

Notes: Duration is the number of quarters between a peak and the next trough of a credit contraction, or an equity price decline. Amplitude is the percent change in credit from a peak to the next trough of a credit contraction, or an equity price decline. Slope is the ratio of amplitude to duration. Credit crunches and equity price busts correspond to peak-to-trough declines in credit and equity prices that are in the top 25 percent of all episodes of credit contractions and equity price declines, respectively within the respective group. In each cell, the mean (median) change in the respective variable from peak to trough of the episodes of credit declines/crunches, 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.

Table 3. Recessions Associated with Financial Disruptions*(Percent change unless otherwise indicated)*

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 bus	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: Duration is the number of quarters between a peak and the next trough of a recession. Amplitude is the percent change in output from a peak to the next trough of a recession. Cumulative loss combines information about the duration and amplitude to measure the overall cost of a recession and is expressed in percent. Severe credit crunches and equity price busts are in the top half of all crunch and bust episodes. 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, or crunch is significant at the 10%, 5%, and 1% levels, respectively.

Table 4. Recessions in Chile
(Percent change unless otherwise indicated)

	Peak	1981:3	1990:1	1998:2	Chile		Emerging Markets	
	Trough	1982:4	1990:3	1999:1	Mean	Median	Mean	Median
A. Output								
Duration		5	2	3	3.33	3.00	3.92	3.00
Amplitude		-20.22	-2.46	-4.59	-9.09	-4.59	-6.54	-4.81
Slope		-4.04	-1.23	-1.53	-2.27	-1.53	-1.69	-1.24
Cumulative Loss		-66.14	-2.66	-7.02	-25.27	-7.02	-17.08	-8.93
B. Components of Output								
Consumption				-6.23	-6.23	-6.23	-2.80	-2.78
Investment			-3.61	-25.87	-14.74	-14.74	-17.09	-13.13
Exports			-11.90	-12.61	-12.25	-12.25	-0.29	0.76
Imports			7.48	2.40	4.94	4.94	-11.91	-10.18
Net Export (% of GDP)			4.64	4.98	4.81	4.81	3.87	1.63
C. Other Macroeconomic Variables								
Industrial Production		-16.87	-2.58	-3.33	-7.60	-3.33	-6.94	-8.21
Unemployment Rate			0.24	2.94	1.59	1.59	1.53	1.06
Inflation Rate		0.62	2.90	-1.49	0.68	0.62	1.04	0.62
D. Financial Variables								
Equity Prices		-24.50	-8.75	-16.20	-16.48	-16.20	-11.08	-17.45
Credit		15.87	-5.40	0.17	3.55	0.17	-4.10	-1.93

Notes: Duration is the number of quarters between a peak and the next trough of a recession. 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 expressed in percent. Empty cells indicate that the corresponding observations are not available due to the lack of data.

Table 5. Credit Contractions in Chile*(Percent change unless otherwise indicated)*

	Peak	1982:2	1985:1	1989:4	Chile		Emerging Markets	
	Trough	1983:4	1986:3	1991:2	Mean	Median	Mean	Median
A.Real Credit								
Duration		6	6	6	6	6	6.48	5.00
Amplitude		-12.03	-11.00	-8.87	-10.63	-11.00	-20.13	-11.62
Slope		-2.00	-1.83	-1.48	-1.77	-1.83	-3.08	-1.86
B.Macroeconomic Variables								
Output		0.39	3.65	8.91	4.32	3.65	1.76	1.93
Industrial Production		6.21	10.77	5.11	7.36	6.21	2.54	2.18

Notes : Duration is the number of quarters between a peak and the next trough of a credit contraction. Amplitude is the percent change in the credit from a peak to the next trough of a credit contraction. Slope is the ratio of amplitude to duration.

Table 6. Equity Price Declines in Chile*(Percent change unless otherwise indicated)*

A. Implications of Equity Price Declines in Chile					
	Peak	1980:3*	1984:2	1992:2	1994:1
	Trough	1983:2	1985:2	1993:2	1994:3
Equity Price					
Duration		11	4	4	2
Amplitude		-71.21	-17.20	-11.99	-6.63
Slope		-6.47	-4.30	-3.00	-3.32
Macroeconomic Variables					
Output		-9.60	0.84	8.09	2.78
Industrial Production		-7.36	-2.95	-1.35	0.35
	Peak	1995:3*	2000:1	2001:3	2005:3
	Trough	1998:4	2000:4	2002:3	2006:1
Equity Price					
Duration		13	3	4	2
Amplitude		-57.72	-15.54	-10.28	-3.23
Slope		-4.44	-5.18	-2.57	-1.62
Macroeconomic Variables					
Output		14.01	2.80	2.30	1.73
Industrial Production		6.56	-1.74	-0.50	1.60
B. Summary Statistics for Chile and Emerging Market Countries					
	Chile		Emerging Markets		
	Mean	Median	Mean	Median	
Equity Price					
Duration	5.38	4.00	5.93	5.00	
Amplitude	-24.23	-13.77	-38.03	-36.63	
Slope	-3.86	-3.81	-7.33	-6.29	
Macroeconomic Variables					
Output	2.87	2.54	4.05	3.47	
Industrial Production	-0.67	-0.92	3.56	2.63	

Notes: Duration is the number of quarters between a peak and a trough of an equity price decline. Amplitude is the percent change in equity price from a peak to the next trough of an equity price decline. Slope is the ratio of amplitude to duration. The symbol * indicates the equity price busts in which the peak to trough decline in equity price is in the top 25 percent of all equity price declines. The threshold amplitude for an equity price bust is -54.46.

**Documentos de Trabajo
Banco Central de Chile**

**Working Papers
Central Bank of Chile**

NÚMEROS ANTERIORES

PAST ISSUES

La serie de Documentos de Trabajo en versión PDF puede obtenerse gratis en la dirección electrónica: www.bcentral.cl/esp/estpub/estudios/dtbc. Existe la posibilidad de solicitar una copia impresa con un costo de \$500 si es dentro de Chile y US\$12 si es para fuera de Chile. Las solicitudes se pueden hacer por fax: (56-2) 6702231 o a través de correo electrónico: bcch@bcentral.cl.

Working Papers in PDF format can be downloaded free of charge from: www.bcentral.cl/eng/stdpub/studies/workingpaper. Printed versions can be ordered individually for US\$12 per copy (for orders inside Chile the charge is Ch\$500.) Orders can be placed by fax: (56-2) 6702231 or e-mail: bcch@bcentral.cl.

DTBC-584
The role of labor markets in structural change
Miguel Ricaurte
Junio 2010

DTBC-583
Firm Dynamics And Real Exchange Rate Fluctuations: Does Trade Openness Matter? Evidence From Mexico's Manufacturing Sector
Miguel Fuentes y Pablo Ibararán
Junio 2010

DTBC-582
Revisiting Overborrowing and its Policy Implications
Gianluca Benigno, Huigang Chen, Christopher Otrok, Alessandro Rebucci y Eric R. Young
Junio 2010

DTBC-581
Fiscal Deficits, Debt, and Monetary Policy in a Liquidity Trap
Michael Devereux
Mayo 2010

DTBC-580
Anchors Away: How Fiscal Policy Can Undermine "Good" Monetary Policy
Eric Leeper
Mayo 2010

DTBC-579
The Credit Channel and Monetary Transmission in Brazil and Chile: A Structural VAR Approach
Luis Catão y Adrian Pagan
Mayo 2010

DTBC-578	Mayo 2010
Borrowing Constraints and Credit Demand Jaime Ruiz-Tagle y Francis Vella	
DTBC-577	Mayo 2010
Proyección Agregada y Desagregada del PIB Chileno con Procedimientos Automatizados de Series de Tiempo Carlos Medel y Marcela Urrutia	
DTBC-576	Mayo 2010
Competition And Stability In Banking Xavier Vives	
DTBC-575	Mayo 2010
The Global Financial Crisis Franklin Allen y Elena Carletti	
DTBC-574	Mayo 2010
The Determinants of Household Debt Default Rodrigo Alfaro, Natalia Gallardo y Roberto Stein	
DTBC-573	Abril 2010
On the Quantitative Effects of Unconventional Monetary Policies Javier García-Cicco	
DTBC-572	Abril 2010
Commodities Pass Through Roberto Rigobon	
DTBC-571	Abril 2010
Supply and Demand Identification in the Credit Market Mauricio Calani C., Pablo García S. y Daniel Oda Z.	
DTBC-570	Abril 2010
Forward premium puzzle and term structure of interest rates: the case of New Zealand Carmen Gloria Silva	
DTBC-569	Abril 2010
Distress Dependence and Financial Stability Miguel A. Segoviano y Charles Goodhart	