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Research Summaries

Booms and Busts

Roberto Piazza



In emerging economies, periods of rapid growth (booms) and large capital inflows can be followed by sudden stops and financial crises (busts). Recoveries can feature low GDP growth and aggregate credit. Research summarized here argues that, at a theoretical level, this pattern can be reproduced with a simple modification of a neo-classical growth model, in the presence of financial markets imperfections giving rise to endogenous borrowing constraints.

Economists colloquially use the expression “boom-bust cycle” to denote a prolonged surge in the GDP growth, followed by a sudden and sharp recession. Boom-bust cycles in emerging economies have received particular attention in the literature. In these economies, high growth can be followed by sudden stops in capital inflows and financial crises. After the bust, the GDP growth and investment rates can remain depressed for a long time (IMF, 2009), and in some instances, they may remain permanently below the pre-crisis level.

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Did Export Diversification Soften the Impact of the Global Financial Crisis?

Rafael Romeu



The impact of export diversification in the global financial crisis can be measured across three diversification dimensions: geographic (whether exports go to many or few trading partners), industry/sectoral (whether exports are scattered across many industries), and product (whether many products are produced within industries). The research summarized here argues that industry and product concentration affected Latin American export resilience during the crisis, but geographic diversification did not.

The financial crisis that began with the 2007 collapse of the U.S. subprime lending market and then spread through 2008–09 is remarkable for its global impact on trade. Typical international spillovers, which could stem from portfolio rebalancing or reduced import demand, for example, were compounded

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Booms and Busts *(continued from page 1)*

Often, during boom-bust episodes, the path of credit expansion and sudden contraction mirrors the cycle in the GDP growth, as shown for instance in Mendoza and Terrones (2008). Moreover, recoveries from the crisis can be “creditless,” meaning that they are characterized by a particularly weak growth in aggregate credit. The parallels between the evolution of GDP growth and of credit aggregates, as documented in Claessens, Kose, and Terrones (2009), have sparked a vivid line of empirical research. Researchers have strived to identify the source of the positive correlation between GDP and credit dynamics during booms, busts, and “creditless” recoveries.

Is the correlation because credit is not needed when growth is low, or is it because there are times when credit is needed but the financial sector cannot provide it, and this depresses economic activity? The latter situation would point to imperfections and inefficiencies in the financial market as a source of aggregate fluctuations in GDP growth rates. For instance, if the banking sector were to be suddenly impaired in its ability to intermediate funds, firms would be forced to curtail their investment plans and GDP would fall. A similar argument would apply if a sudden fall in the value of firms’ collateral would constrain firms’ ability to issue new debt.

Does the empirical evidence support the view that credit constraints arising from financial imperfections can account at least in part for GDP dynamics during booms, busts, and recoveries? Even though this question is still very much open, there is suggestive evidence that the answer might be positive, at least in situations when financial markets impairments are due to banking crises, as studied by Abiad, Dell’Ariccia, and Li (2011), and Dell’Ariccia, Detragiache, and Rajan (2007).

The theoretical literature has long recognized that financial markets imperfection, acting through borrowing constraints, can be a source of aggregate fluctuations. For instance, Mendoza (2008) shows how borrowing constraints can amplify fundamental shocks to a small open economy and generate deep recessions and credit contractions. In this literature, the fundamental shock to the economy is usually a total factor productivity (TFP) shock. In Piazza (2010) I take a different theoretical approach. In particular, I construct a neoclassical growth model for a small open economy and show how a growth process characterized by a boom-bust cycle can be caused by financial imperfections even in the absence of TFP shocks. The model is based on two corner-

stones, namely, uncertainty on the path of (decreasing) marginal returns to capital and a financial market imperfection.

To fix the ideas on the first cornerstone, it is useful to start from a simple example. Consider a closed economy inhabited by two types of agents: entrepreneurs and workers. Entrepreneurs operate in the industrial sector, and produce according to a neoclassical and constant returns to scale production function with capital and labor as inputs. Workers can live in the countryside, where they are farmers and gain a (low) constant subsistence wage, or they can move to the city and be employed in the entrepreneurial industrial sector. It is clear that, as long as a strictly positive amount of farmers remains in the countryside, the equilibrium wage in

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the industrial sector must be constant, and equal to the subsistence wage of farmers. The marginal return to capital in the industrial sector is then constant too. Instead, when the pool of farmers that can be attracted to the industrial sector is exhausted, the scarcity of workers will raise the industrial wage above the subsistence level, thus lowering the equilibrium marginal return to capital.

The model described above has the following simple equilibrium property: marginal returns to capital in the industrial sector are initially constant, and start to decrease only when the economy has reached a certain “turning point,” identified as the moment when the pool of farmers in the countryside is exhausted. If we assume that the size of the pool of farmers is not known with certainty, then the timing of the turning point becomes uncertain too. Clearly, the arrival of the random turning point brings “bad news” to the industrial sector, since it signals that marginal returns are starting to decrease. By making proper assumptions on the production function, we can easily construct cases where marginal returns to capital decrease at an arbitrarily small pace after the turning point. In these cases, we can say that the turning point brings arbitrarily “small” negative news to the economy.

The second cornerstone in my analysis is a financial market imperfection. I assume that entrepreneurs in the urban industrial sector can accumulate capital either by retained earnings, or by borrowing from international investors. Debt contracts suffer from limited enforceability, so that entrepreneurs can choose to renege on their obligations and default on their firm's foreign debt. Individual default is associated with a punishment, in the form of a temporary productivity loss and restriction from further accessing the financial market. Naturally, a firm which is large, as measured by the size of its installed capital, suffers a large total output loss from the punishment of a reduced productivity. A more painful punishment for default implies that a large firm can commit to higher levels of debt before entrepreneurial default incentives are triggered. A larger installed capital acts then as a commitment device, or "collateral," that allows entrepreneurs to relax their endogenous borrowing constraints and increase their debt.

The core result of Piazza (2010) is to show that arbitrarily "small" negative news, revealed at the turning point, concerning the decreasing path of marginal returns can cause booms and busts in credit and GDP growth. In particular, before the turning point, endogenous borrowing constraints are large, growth is high, and the economy is booming. At the turning point, borrowing constraints are suddenly tightened, creating a credit crunch and forcing individual borrowers to default. Productivity costs associated with default cause a bust. After the turning point, borrowing constraints are permanently tighter, generating a recovery with low growth and low aggregate credit. The linchpin for this result is what I call the equilibrium self-reinforcing property of growth and borrowing constraints: high growth endogenously relaxes borrowing constraints, which in turn foster higher growth and even larger borrowing constraints.

The reason for this property is quite intuitive. If the economy is growing fast, entrepreneurs' capital stock (the "collateral") is growing fast too. Hence, entrepreneurs' borrowing constraints are expanding rapidly. With a rapidly expanding debt, entrepreneurs not only are able to maintain high investment rates, but can also keep rolling over most of their debt obligations. Since old debt is mostly repaid by issuing new, and thus without having to reduce consumption, entrepreneurs have little incentives to default. This allows lenders to further relax borrowing constraints on entrepreneurs, who can then increase investment, boosting the growth rate of capital and of the economy even more.

The conclusion of Piazza (2010) is that, because of the self-reinforcing property, endogenous borrowing constraints turn out to be extremely sensitive to news about growth prospects which, within the neoclassical growth framework I adopt, are linked to news on the path of marginal returns to capital. The sensitivity is so extreme that even arbitrary "small" negative news, revealed at the turning point, can be greatly amplified by the self-reinforcing property, leading to a sudden and permanent credit crunch and thus to boom-busts cycles in credit and GDP growth.

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Did Export Diversification Soften the Impact of the Global Financial Crisis?

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during this crisis by financial turbulence that greatly reduced the liquidity of wholesale funding markets. The resulting increase in financial market uncertainty drove credit reductions to firms and households, and consequently led to the most pronounced synchronized trade decline since the Great Depression.

In the wake of this increasingly synchronized international trade, questions have arisen both about this international interdependence and about whether policies can reduce the impact of trade shocks. For example, the IMF has recently turned its attention to conducting surveillance of international outward spillovers from large and systemic global economies in its appropriately titled *Spillover Reports*. Academic research has continued with increased efforts toward empirically identifying factors that explain how and to which countries a crisis spreads—this is the well-known contagion literature. This literature usually focuses on a cross-section of countries and attempts to identify trade and financial channels of contagion. An equally daunting challenge, however, is to successfully identify country-specific trade characteristics that public policy can influence, and that are empirically linked to the severity of the crisis in each country, as measured, for example, in terms of the decline of its exports.

This is a question of degrees—it is difficult to imagine a set of policies that an economy can realistically implement to insulate itself from a shock of the magnitude of the recent global financial crisis. Nonetheless, the cross-country evidence from the recent crisis suggests that countries and regions were not equally affected. For example, while both advanced and emerging economies had similar peak-to-trough declines in trade indices in the first quarter of 2009 (approximately between 20 and 25 percent), sharp differences are evident across regions, including declines in Africa and the Middle East of just over 10 percent, as compared to a 41 percent decline in Japan. Hence, identifying which country-specific trade characteristics are empirically linked to the severity of the crisis in each country—for example, in terms of the decline of its exports—would be a step forward in developing policies to help soften the impact of international crises.

One useful starting point could be trade diversification—the diversity of products and services that a country sells or

buys from the rest of the world. Research going as far back as the mid-1960s has found a positive and significant relationship between how diversified a country's export product base is and its long-term economic growth rate. More recent research into export diversification and growth often has focused, importantly, on the need to diversify natural resource exports (e.g., Cohen, Joutz, and Loungani 2011 or Ricci and Trionfetti 2011). While the progress in these areas appears promising, a different and perhaps useful direction could be to also consider what broader role export diversification plays in the short term, and particularly, whether it helps or hurts during global downturns.

Costa Neto and Romeu (2011) study this question by assessing the impact export diversification had in the crisis through three different dimensions of trade specialization. First, concentration of exports by geographic destination is considered; that is, whether the bulk of exports from a country go to many or few trading partners. Second, industry/sectoral export concentration is considered; that is, whether a country's exports are scattered across many industries and sectors, or concentrated in just a few. Third, product export concentration is considered; that is, whether countries produce many products within their export sectors or just a few. A country's silk exports, for example, could vary in concentration across the different products classified within this category of exports, such as silkworm cocoons suitable for reeling, raw silk (not thrown), woven fabrics of silk or silk waste, etc.

To find the role that export diversity potentially plays in softening the impact of the global crisis, one can construct a measure of how diverse a country's trade is across the three dimensions described above. The measure used in Costa Neto and Romeu (2011) is the Herfindahl index, which usually measures the market concentration of firms across industries. This index goes from zero to unity, and represents the squared sum of the market shares. For comparison purposes, the United States Department of Justice considers an industry to be moderately concentrated when the index goes above 0.1.

Using this index, one can then estimate the impact of the three aforementioned types of trade diversity within a trade model. The most successful of these models exploits the “gravity” trade relationship, which, broadly speaking, posits that the volume of trade between countries depends on the geographical distance separating them, the relative size of each country (with size measured by GDP), and a number of factors influencing trade costs, such as free trade agreements,

common languages, a shared border, and other factors (e.g., Romeu 2008, Romeu and Wolfe 2011).

In these estimations, the impact of export product diversity can be best understood as influencing trade costs. Export diversity could increase country productivity for the same reason that it increases long-term growth, and the crisis likely had a stronger impact on less productive firms

“To find the role that export diversity potentially plays in softening the impact of the global crisis, one can construct a measure of how diverse a country’s trade is across the three dimensions— export concentration by geographic destination, industry/sector, and product.”

or sectors. Nonetheless, there is strong empirical evidence of non-linearities from trade agreements or restrictions, fixed shipping costs, scale economies, and other trade barriers that complicate incentives to diversifying across products and trading partners and hence could motivate an agnostic view of the role diversification plays in trade (e.g., Henn and McDonald 2011).

Costa Neto and Romeu (2011) estimate this relationship using highly disaggregated bilateral international trade data based on the Harmonized System (HS) of trade reporting at the four-digit level for fourteen Latin American economies. The high level of disaggregation in these data is useful because it provides sufficient observations so as to plausibly capture the dynamics during the crisis within each industry, even though the bulk of the decline occurred across one or two quarters in 2008–09. The estimation also focuses on Latin American countries because they differ greatly in their level of export concentration but are fairly homogeneous in other aspects, thus reducing the risk that some latent country or intra-regional factor is driving any results found.

The degree of export concentration played a statistically and economically significant role during the recent global financial crisis. Specifically, the level of trade concentration is compared across countries after controlling for other global factors in order to identify whether it intensifies or attenuates the global financial crisis on exports. Both prod-

uct and industry diversification helped attenuate the impact of the crisis, while destination/geographic diversification did not. In the baseline regression, the impact of product, sector, and destination diversification on the quarterly change in trade flows is estimated for Latin American economies, controlling for macroeconomic and trade factors. All else equal, exports are found to decline by approximately 4.7 percent for each decimal unit increase in the (Herfindahl-based) industry trade concentration index (with a similar empirical result found for product diversification within export industries).

The evidence for geographic diversification is weaker and negative, i.e., more geographic diversification worsens the impact of the crisis on exports. As many of the economies in the sample naturally concentrate their trade with the United States because of geographic proximity and other factors, these results suggest that proximity to the United States during the crisis was at least not detrimental to outcomes for indicators of the incidence and severity of the crisis.

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Seven Questions about Large Fiscal Consolidation Attempts in the Past and Implications for Policymakers Today

Fuad Hasanov and Paolo Mauro



*How can high and growing public debts in the largest advanced economies be stabilized and reduced? Although the scale of today's challenge is unprecedented, there is much to learn from past attempts at fiscal consolidation. A recently published book, *Chipping Away at Public Debt—Sources of Failure and Keys to Success in Fiscal Adjustment*, analyzes the design of fiscal adjustment plans and compares them with outcomes, using individual case studies for each of the G-7 countries and cross-country statistical analysis for the European Union member countries over the past two decades. The questions and answers below illustrate how large fiscal consolidation attempts fared in the past and what can be learned from these cases to guide policymakers today.*

Question 1: How serious is the need for fiscal consolidation in the advanced economies today?

The global financial crisis has caused government debt to soar in the advanced economies. Public concern is rising and debates rage on how to fix the problem. For the advanced economies, the average debt-to-GDP ratio is now approaching 100 percent—higher than at any time since World War II—and is set to increase further. In many countries the required fiscal adjustment is historically unprecedented. It will take many years of chipping away at the public debt to bring it back down to more prudent levels. Fiscal adjustment will be one of the defining economic challenges for the advanced economies over the next decade.

Question 2: Why look at fiscal consolidation attempts, rather than success stories?

Chipping Away at Public Debt examines past attempts to reestablish sustainable public finances. The book seeks to explain what worked, what did not, and why. It looks in detail at the cases of Canada, France, Germany, Italy, Japan,

the United Kingdom, and the United States and performs a statistical analysis using data from three-year convergence and stability programs for the European Union (EU) countries for the 1991–2007 period. Previous empirical studies (e.g., Alesina and Perotti, 1995; Alesina and Ardagna, 1998) identified fiscal adjustment episodes on the basis of ex post outcomes. Instead, we approach fiscal adjustment plans on the basis of large envisaged reductions in debt and deficit. This approach allows us to learn not only from successes but also failures, to compare ex post outcomes with ex ante plans, and to avoid sample selection/survivorship bias.

Question 3: How were fiscal consolidation plans designed and implemented?

Initial fiscal position and “carrots” (like EMU accession) are key drivers of planned deficit adjustment. Planned adjustment was skewed toward spending cuts given the large initial size of government, especially in Europe. Interestingly, a majority of plans envisaged such large expenditure cuts that room for some tax cuts would also be created. Of 66 large adjustment plans in the EU, only one-third stipulated increases in the revenue-to-GDP ratio, and only ten plans were grounded in well-specified tax policy measures. This contrasts with ex post identification of fiscal consolidations, almost all of which featured revenue increases, albeit modest ones. The plans’ design was not flawed by overly optimistic macroeconomic assumptions (growth, interest rates, etc.) when compared with contemporary, independent forecasters. On the whole, the implementation record, although short of the plans on average, was not bad at all: with a planned average improvement of overall balance of 2.5 percent of GDP over three years in the EU, actual improvement was 2 percent of GDP. In addition, more ambitious plans produced more adjustment than less ambitious plans, on average. Although planned adjustment was stipulated mostly through cuts in expenditures, actual expenditure cuts did not materialize to the extent envisaged and revenues compensated in part.

Question 4: What was the role of macroeconomic factors in implementing the plans?

Economic growth played a key role in the extent to which the plans’ objectives were met. Deviations of eco-

conomic growth from initial expectations were a major factor underlying success or failure of the fiscal consolidation plans studied. A percentage point increase in the growth surprise improved the implementation error, or a deviation of actual from planned adjustment, by ½ percent of GDP. There is also some evidence of asymmetric effects of growth surprises: when growth surprised on the downside, the implementation error worsened by more than when growth surprised on the upside. Policymakers are more likely to undertake countercyclical fiscal measures in a weaker than anticipated economy.

Question 5: How do political and institutional variables affect implementation of the plan?

Political and institutional factors proved to be important in achieving the fiscal objectives embedded in governments' plans. The following features of fiscal institutions seem relevant for successful plan implementation: (i) monitoring of fiscal outturns with reliable and timely data and a response to data revisions (e.g., in 66 adjustment plans in the EU, the degree of adjustment was seldom increased in response to unexpected increases in estimated initial deficits); (ii) binding medium-term limits; (iii) contingency reserves; (iv) coordination across levels of government; and (v) fiscal rules. In addition, lower fractionalization in the legislative body and perceptions of greater political stability seemed to play a role, but the evidence is more tentative. Instead, public support was clearly found to be instrumental to implementation success. For example, opinion polls in Canada in the early 1990s showed that citizens saw public debt as the number one problem. This made it easier for the fiscal adjustment plan that ensued to be successful.

Question 6: What are the past pitfalls of fiscal consolidation to learn from?

First, governments overestimated their ability to cut spending. In Europe, for example, governments were unable to cut as much spending as they had initially planned. Eventually, European governments had to raise more revenues than they had originally intended. We saw this in Italy and France in the mid-1990s and in countries outside Europe too. Second, governments often mistook strong growth and booming asset prices for fiscal adjustment. In the 1990s, the United States saw revenues increase, and by the end of the decade there was widespread concern that the public debt might disappear. Nevertheless, the U.S. deficit soon started increasing again. In hindsight, we know the good times of the 1990s and 2000s should have been used more wisely.

Question 7: What are the key lessons for policymakers today?

First, have a plan. This is crucial to reassure markets and the public and to keep the cost of borrowing low. Second, be aware that outcomes will turn out differently than expected. Unexpected declines in economic growth lead to low revenues and changes in the government's views of whether adjustment or stimulus is needed. We saw this in Germany in the 1970s, in Japan in the 2000s, and in many countries during the recent crisis. Third, when designing a plan, make sure responses to shocks, especially to economic growth, are spelled out. As President Dwight Eisenhower said, referring to a military context in which the situation often shifted abruptly, "planning is everything." Fourth, when reducing deficits, think through the role of the state, and what expenditures offer the best value for the money. The most successful case we review in the book, Canada, did exactly this. Germany in the mid-2000s is another good example. Fifth, since almost none of the fiscal adjustments identified by previous studies as "revenue-based consolidations" were intended as such in policymakers' plans, it is clear that such revenue-based consolidations occurred because of temporary factors such as booms in economic activity and asset prices. Instead, it is reform-based (whether expenditure- or revenue-based) adjustment that attains its objectives in a lasting manner. Finally, fiscal adjustment objectives are more likely to be attained if they are supported by the general public. It is crucial to explain in lay terms that fiscal adjustment is ultimately needed to keep borrowing costs low, and thus ensuring that jobs are created and economic growth revives and to clearly outline plans whose burden will be shared fairly among various groups.

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