Paraguay: Is Good Macro Policy Enough to Ensure Adequate Resilience to Adverse External Shocks? How Does It Compare to Other Emerging Markets?

Liliana Rojas-Suarez

Abstract

This paper assesses the resilience of Paraguay's economic and financial stability to external shocks. To this end, the paper expands on previous work by Rojas-Suarez (2015) and constructs a *resilience indicator* that has two dimensions: the first refers to the capacity of an economy to withstand the impact of a shock while the second signals the capacity of national authorities to quickly respond to its adverse effects. By applying the methodology of the resilience indicator to 22 emerging market economies, this paper reaches two main conclusions for Paraguay. The first is that the authorities' efforts to improve the country's macroeconomic stance since 2003 have paid off and will continue to do so if a new adverse external shock hits the economy. From the perspective of the second dimension of resilience, just as in the pre-global crisis period, Paraguay is now one of the most resilient countries among emerging markets. The second conclusion is that the first dimension of resilience, the economy's capacity to withstand the impact of a shock, was not very strong in the pre-global financial crisis period and, relative to other emerging markets, has not improved since then. In the absence of reforms, Paraguay's relatively weaker performance in structural variables (export concentration, national savings ratio, tax revenue collection, and financial depth) will severely limit the benefits of a strong macroeconomic stance to deal with the adverse effects of external shocks.

Keywords: Emerging markets, economic resilience, external shocks, Paraguay, convergence, fiscal management, macroeconomic policies, local finance, external position

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I. Introduction

In recent years, Paraguay, a small, landlocked, commodity-exporter economy, stands out for showing one of the highest rates of economic growth among Latin American countries.[1] This was attained while maintaining fiscal prudence and avoiding large external imbalances.[2] While these achievements are impressive, Paraguay cannot afford to lose momentum or suffer a deterioration in its economic performance. The reason is that the country *needs* to continue on a high growth path to keep climbing up the ladder of economic development: While the World Bank reclassified Paraguay in 2015 from lower middle-income status to upper-middle income, the country still has a long way to go to reach the levels of real income per capita and social development of most other Latin American countries.

In this context, economic *resilience* to adverse external shocks, especially if these are sustained, becomes extremely relevant for Paraguay. Given current international developments in advanced economies, ranging from the normalization in US monetary policy to protectionist threats to potential increased volatility in commodity prices, the emergence of new adverse shocks hitting Paraguay and other emerging market economies is very much on the cards. How resilient is Paraguay to these potential shocks? How does it compare to other emerging market economies? And has its resilience improved since the global financial crisis? This paper builds upon the work by Rojas-Suarez (2015) to address these issues.

As in Rojas-Suarez (2015), economic resilience is broadly defined here. A country is said to be highly resilient to an adverse external shock if the shock does not result in a sharp contraction of economic growth and/or the emergence of deep instabilities in the financial sector. A central premise of both papers is that a country's economic performance in the presence of an adverse external shock largely depends on that country's economic and financial strength *before* the shock. That is, initial conditions matter significantly to assess resilience.

To identify variables that signal a country's economic resilience, this paper follows Montoro and Rojas-Suarez (2012) in recognizing that there are two dimensions of resilience: a country's capacity to withstand the *impact* of external shocks and the authorities' capacity to quickly respond to their effects. Variables that define these two dimensions can be macro indicators (such as the current account to GDP ratio and the fiscal balance) or structural variables (such as savings ratios and export concentration). While the first set of variables can fluctuate significantly from one year to the next, the second set usually takes significantly longer periods of time to change. Thus, the strength of structural variables in the period

[1] Paraguay exports are concentrated in agricultural products (soy and derivatives and cereal), beef and electricity. The most important export destinations are Brazil, Argentina, Russia and Chile.

[2] For a detailed discussion on recent policy achievements and challenges in Paraguay, see Banco Central del Paraguay (2016)

preceding an adverse external shock is particularly important to assess a country's resilience in cases where the shock is persistent.

These two categories of indicators are combined to form an overall *Resilience Indicator* that can be used to make cross-country comparisons, as well as to evaluate an individual country's performance over time. The relative comparisons are conducted not only for the overall *Resilience Indicator* but also for the individual components; therefore, the exercise permits identification of specific areas of strengths and weaknesses in Paraguay and, can therefore, be a useful analytical tool to guide policymakers' actions.

The rest of this paper is organized as follows: Section II argues about the importance of maintaining economic resilience in Paraguay by presenting a simulation exercise that estimates the number of years it would take Paraguay to reach the real income per capita levels of advanced economies under alternative growth scenarios. Section III presents the framework used in this paper and characterizes the two dimensions of resilience to identify the variables that form the *Resilience Indicator*. Sections IV and V discuss each of these variables in turn and compare their behavior in 2007 (the pre-global financial crisis year) with that in 2017 (or the latest available information) for a sample of 22 emerging market economies, including Paraguay. Section IV focuses on the variables that form the first dimension of resilience and Section V discusses those that belong to the second dimension. Both sections identify which strengths/vulnerabilities to external shocks have improved and which have worsened in Paraguay since the global financial crisis. The sections also compare the behavior of these strengths/vulnerabilities in Paraguay relative to other emerging markets. Section VI combines the variables discussed in the previous sections to construct the *Resilience Indicator*. Paraguay's ranking in this indicator is presented and explained. Section VII concludes the paper.

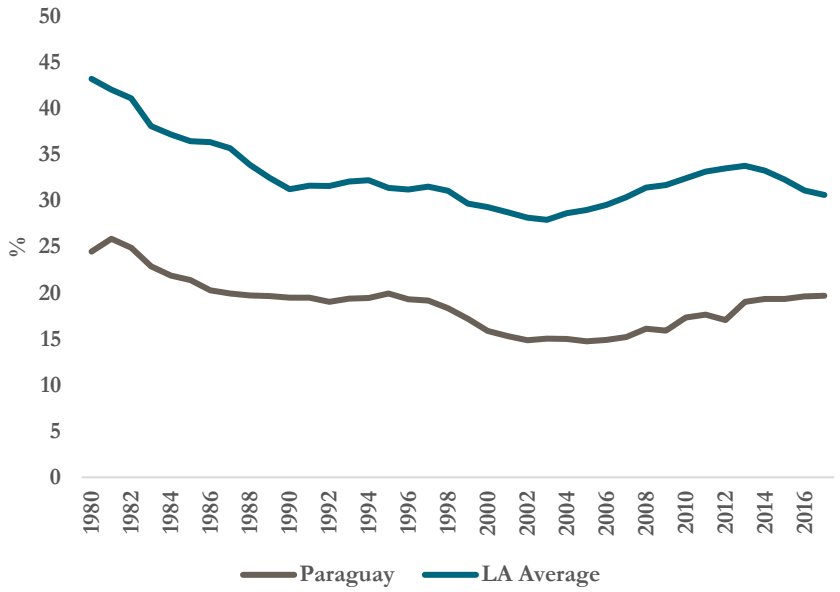
II. The context: Paraguay's long road ahead for convergence to advanced economies' real income per capita

As has been well documented in the literature, economic growth is a key determinant for poverty reduction (see WDR 2000-2001 and Ravallion (2016)). Attaining and maintaining economic growth and resilience to adverse external shocks is, therefore, imperative for Paraguay, which despite large reductions in poverty rates still displays one of the lowest income per capita among Latin American countries.[3]

[3] Severe external shocks have, in the past, had profound adverse effects on Latin America's growth path. Examples abound: from the crises in the 1980s, when the sharp increase in interest rates in the US hit an economically and financially fragile Latin America and ended in a decade of anemic growth, to the Russian and East Asian crises of the 1990s that derailed the growth paths of a number of countries in the region, including Paraguay. Most recently, however, improved macroeconomic performance and structural reforms allowed the region to contain the damaging impact of the 2008 global financial crisis.

Indeed, an estimation of income gaps relative to advanced economies shows that, despite its important economic achievements, in recent history Paraguay's income has remained consistently below that of the Latin American average. This is shown in Chart 1, where income per capita is measured as real GDP per capita, in constant international dollars of 2008 and adjusted for purchasing power parity (PPP). Data to construct the chart is taken from the IMF World Economic Outlook and the United Nations World Population Prospects databases. The period covered is 1980-2017.[4]

Chart 1: GDP per capita relative to advanced economies (PPP, constant international dollars (2008=100); in percentages)



Source: own elaboration based on IMF-WEO and UN World Population Prospects

There are two important conclusions from the chart: The first is that Paraguay lags significantly relative to the Latin American average with respect to the income per capita gap. While, by 2017, the real GDP per capita (adjusted for PPP) of Paraguay was only 20 percent of the corresponding figure for advanced economies, that of the Latin American average had reached 31 percent. At that time, the real GDP per capita of Chile, the country with the highest level of development in the region, had reached more than 50 percent the advanced economies value.

The second, and very promising, conclusion is that in the most recent years the difference between the Paraguayan and Latin American gaps has been declining. This is explained by the continuation of relatively high rates of growth in Paraguay, which contrast with the

[4] A real measure of the GDP per capita in PPP terms is constructed by taking the nominal GDP in PPP terms and re-basing it using constant 2008 international dollars and then dividing the metric by the total population. The regional definition of Advanced Economies follows the categorization of the International Monetary Fund. Figures for the real GDP per capita (adjusted for PPP) represent the average of countries in that grouping.

anemic growth displayed by the region following the sharp decline in commodity prices in the period 2013-16.

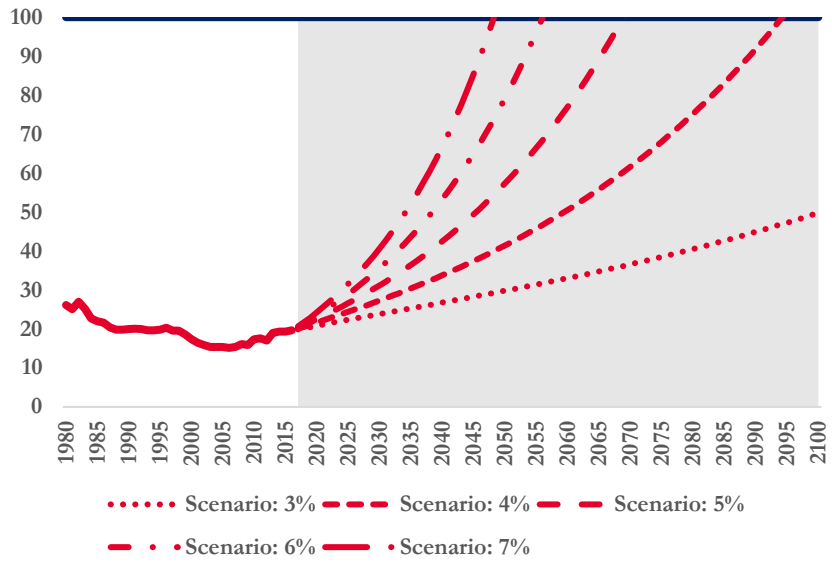
How long will it take for Paraguay to close the income per capita gap? Although it is impossible to give an exact answer to this question, it is possible to construct simulation exercises that shed light on the issue. The question can then be rephrased as follows: Under certain assumptions regarding economic and population growth in advanced economies, how long would it take for Paraguay to reach the real GDP per capita of advanced economies *under alternative growth scenarios for this country*?

Starting with the observable data for real GDP per capita in 2016 (adjusted for PPP, in constant international dollars of 2008), we project the value of real GDP per capita for advanced economies for every year from 2017 to 2100 based on the following assumptions: (a) real GDP (adjusted for PPP) of advanced economies grows at a constant annual rate of 2 percent; and (b) population growth is taken from the projections by the *World Population Prospects* of the Population *Division* of the United Nations.[5]

For each year, we calculate the average of the real GPD per capita (adjusted for PPP) of advanced economies. Those values are re-scaled such that every year they take the value of 100 percent (since the exercise tries to simulate how long would it take to Paraguay to reach—at 100 percent—the income per capita levels of advanced economies). Based on these estimates, Chart 2 shows 5 plausible scenarios of real GDP growth for Paraguay ranging from 3 to 7 percent.

[5] The exercise is based in the baseline scenario of the United Nations. This organization also present alternative projections that take into account the evolution of certain other variables (such as differential fertility rates, for example).

Chart 2: Convergence scenarios: Paraguay's real GDP per capita gap relative to advanced economies, under alternative growth assumptions (PPP, constant international dollars (2008=100); in percentages)



Source: own elaboration based on IMF-WEO and UN World Population Prospects

The conclusions from this exercise are striking: Under a scenario where Paraguay grows at an annual rate of 3 percent, the country simply does not close the real income per capita gap with respect to advanced economies in the next 100 years! If it grows at 5 percent, the gap can be closed in 50 to 55 years. An annual growth rate of 7 percent would allow closing the gap in about 30 years. For comparison, it is interesting to note that a similar exercise for Chile indicates that this country could close the gap in 36 years growing at an annual rate of 4 percent and in 15 years if it were to grow at 7 percent. The advantage of Chile over Paraguay in terms of current income per capita largely explains these results.[6]

It is of course important to underline the limitations of the previous exercise and its high dependence on the set of assumptions utilized. Thus, these results should be taken as indicative only. Nevertheless, they serve to illustrate the importance of maintaining high growth rates in Paraguay and, therefore, the high relevance of building resilience against adverse external shocks.

III. Indicators of economic resilience: a framework

Consistent with Montoro and Rojas-Suarez (2012) and Rojas-Suarez (2015), this paper argues that a country's economic performance in the presence of an adverse external shock largely depends on that country's economic and financial strength *before* the shock. That is, initial conditions matter significantly. As shown in the aforementioned papers, the economic

[6] In addition, but to a lesser extent, demographic changes play a role in explaining differences between Chile and Paraguay.

path followed by Latin America and other emerging markets during the global financial crisis was largely influenced by the behavior of key variables during the pre-crisis period, which can be defined as the year 2007, a relatively tranquil year for emerging markets, in the sense that no major economic or financial crises took place.

Economic resilience to external shocks can be characterized as having two dimensions: The first is the country's capacity to *withstand* the impact of an adverse external shock and the second is the authorities' capacity to *rapidly implement policies* to counteract the effects of the shock on economic and financial stability. This section identifies a set of indicators that can adequately measure the two dimensions of resilience.

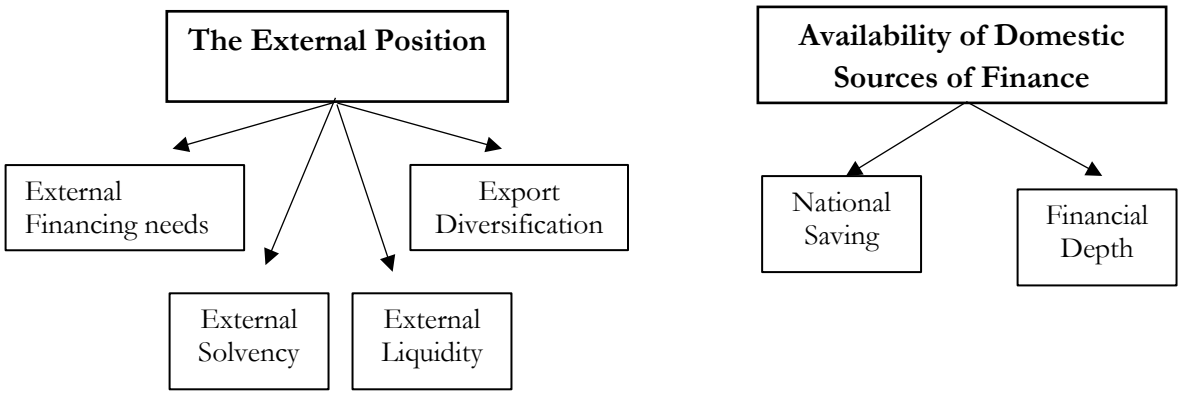
To guide the identification of indicators in the *first dimension*, it is key to notice that a central adverse effect of external shocks is the decline in the external sources of finance and an increase in their cost. Such shocks can deteriorate a country's perceived growth performance and economic and financial stability, leading international and domestic investors to be less willing to finance projects or invest. This effect may happen through the commercial channel (for example, as a result of a large decline in the demand for a country's exports) or the financial channel (for example, as a result of a sharp increase in the US interest rates). While financial shocks directly press for increases in the cost of external financing, a trade shock indirectly leads to similar pressures as funding costs are influenced by investors' perception of increased risk. These features imply that a country's capacity to *resist the impact* of an external shock will be greater: (a) the stronger its external position, and (b) the larger the availability of domestic sources of finance to offset the decline in external funding.

In turn, a country's external position at the time of the shock can be defined by its external financing needs (as reflected by the current account), the sustainability of its external debt position (a solvency indicator that can be proxied by the ratio of total external debt to GDP), the availability of liquid resources to meet short-term debt obligations (a liquidity indicator that is reflected in the ratio of short-term external debt to international reserves) and the country's capacity to absorb a sharp decline in the price of a major export product (as signaled by the degree of export diversification).

In addition, the availability of domestic sources of finance to counteract the sudden scarcity and/or higher costs of external sources of finance is reflected in the national savings ratio and in the depth of the financial system.

Chart 3 systematizes the first dimension of economic resilience (see next page).

Chart 3: The first dimension of economic resilience: The capacity to *withstand the impact* of external shocks



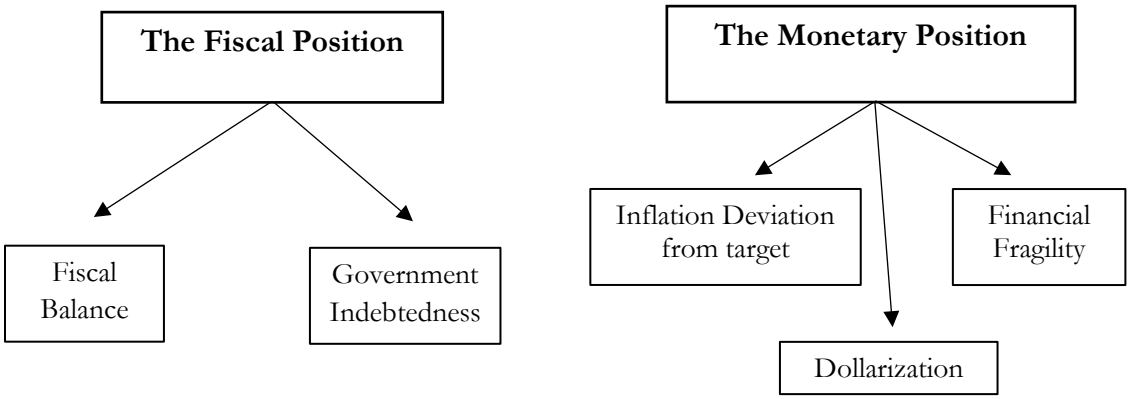
With respect to the *second dimension* of resilience, the authorities' capacity to quickly respond to the effects of an adverse external shock, largely depends on the fiscal and monetary positions at the time of the shock; that is on the fiscal and monetary space available to implement adequate policies, which in many cases, need to be counter-cyclical ones.

The fiscal position is defined by the government's financing needs (the fiscal balance) and its degree of indebtedness (domestic and external).

At the same time, the space for countercyclical monetary policy is determined by the absence of constraints that might limit the capacity of the Central Bank to use its policy tools (such as changes in the policy interest rate or interventions in foreign exchange markets) or the effectiveness of these tools. Significant departures from announced inflation targets, fragilities in the financial system and/or high levels of dollarization have been identified as constraints to the pursue of effective monetary policy.

Chart 4 systematizes the second dimension of economic resilience.

Chart 4: The second dimension of economic resilience: The authorities capacity to *rapidly respond* to the effects of a shock



Notice that in each of the two dimensions there are macro variables (such as the current account, debt ratios and the fiscal balance stance) and structural variables (such as the savings ratio, financial depth and dollarization). While the macro variables can fluctuate significantly in the short run, the structural variables usually take a longer amount of time to change. Thus, the latter are particularly relevant to assess a country's economic resilience in the presence of persistent shocks.[7] Table 1 classifies the variables included in each of the two dimensions as either macro or structural variables.

Table 1: Components of the resilience indicator

	Capacity to Withstand the Impact of a Shock	Capacity to Quickly Respond to the Effects of a Shock
Macro Variables	External Financing Needs, External Solvency, External Liquidity, Government Indebtedness	Fiscal Balance, Inflation Deviation from target, Financial fragility indicator
Structural Variables*	Export diversification, National Saving, Financial Depth	Dollarization

*Annex II will consider the effects of an additional structural variable: tax collection

In the following two sections, I further discuss the set of variables measuring these two dimensions and compare the behavior of each variable in 2007 (the pre-global financial crisis year) with that at the end of 2016 or 2017 (latest available observation) for a sample of 22 emerging market economies, including Paraguay. This exercise will help identify which strengths/vulnerabilities to external shocks have improved and which have worsened in Paraguay since the global financial crisis. Moreover, it will also allow to compare the behavior of these strengths/vulnerabilities in Paraguay *relative* to other emerging market economies. The countries the sample are of three regions: Latin American (Argentina, Brazil, Chile, Colombia, Mexico, Paraguay and Peru), Emerging Asia (China, India, Indonesia, Malaysia, Philippines, South Korea and Thailand), and Emerging Europe (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Romania). The criterion for including countries is the availability of comparable data.

IV. The first dimension of macroeconomic resilience: The capacity to withstand the impact of external shocks

Increased cost and reduced availability of external financing are well-known vulnerabilities to external shocks for emerging market economies. As noted in Section III (chart 3), the potential destabilizing effects of an adverse external shock on an emerging market economy will depend, among other factors, on a country's external position (its need for external financing, its external solvency and liquidity stance and the diversification of its exports) and the availability of domestic sources of finance (reflected by the savings ratio and the depth of

[7] In terms of measurement, this means that, unless indicated otherwise, we take the annual values for the macro variables, while we construct 3-year moving averages as the relevant values for the structural variables. This smoothing process tries to capture changes in trend in the structural variables.

the local financial sector). The rest of this section analyzes the behavior of the six variables used here as indicators of the first dimension of economic resilience. To assess improvements or deteriorations in the capacity to withstand the impact of external shocks, for each of the variables and countries, we compare the most recently available data with data for 2007, the year before the global financial crisis

1. The current account balance as a ratio of GDP

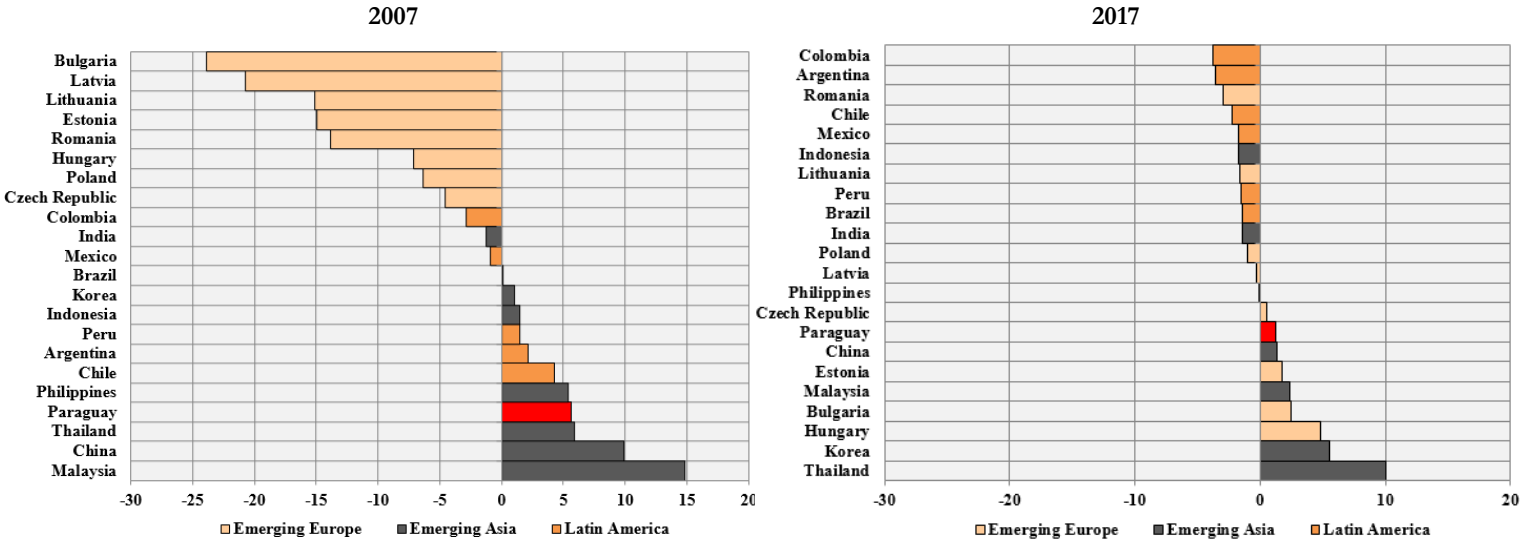
The current account balance as a ratio of GDP, a *flow* measure, is a customary indicator of a country's existing (at the time of the shock) external financing needs. Large current account deficits need to be financed either with net capital inflows or the utilization of international reserves.

A comparison of countries' current account balances in 2007 and the most recently available data in 2017 (IMF World Economic Outlook (2017) end-of-year forecast) indicates sharp differences in the evolution of external financing needs between regions. As shown in chart 5, the current accounts in Paraguay and all the other Latin American countries in the sample have deteriorated relative to the pre-global crisis period. For many countries in the region, this result reflects a combination of overconfident behavior, the resulting lack of economic reforms during the post-crisis years, and bad luck. While the sharp decline in the prices of commodity exports that started in 2012 was certainly a development out of the region's control, the lack of reforms to overcome the deficiency of savings over investment was not. The *good years* of high commodity prices were not used to protect these countries from sharp declines in commodity prices. Thus, relative to a decade ago, Latin America's external financing needs are larger in 2017 putting the region in a more vulnerable position to face new external shocks.[8] This contrasts with the situation in Emerging Europe, where policy adjustments implemented to deal with the severe effects of the global financial crisis have drastically reduced these countries' extremely large external financing needs in 2007.[9] By 2017, all countries in the Eastern Europe sample had improved their current account balances and several displayed surpluses.

[8] However, it is important to note that the current account positions in a number of Latin American countries were improving since late 2016 to the time of this writing.

[9] Emerging Europe was poorly positioned in 2007 to face the collapse of external financing that took place during the global financial crisis. A number of factors, notably unrealistic expectations about a rapid entrance to the euro area, led to excessive debt-related risk-taking by the private and public sectors. This was reflected in large current account deficits and, as shown below, huge ratios of external debt to GDP.

Chart 5: Current account balance / GDP
(in percentages)



Source: own elaboration based on *IMF*-WEO and Banco Central del Paraguay (2017a), *Informe de Política Monetaria*

Although Paraguay's current account deteriorated relative to 2007, it is the only Latin American country in the sample that reports surpluses (since 2016). Improvements in trade activity with neighbors Argentina and Brazil and improvements in the price and volume of soya exports are among the factors explaining this result. Together with most Emerging Asian countries in the sample and several countries from Eastern Europe, Paraguay is among the best positioned countries regarding financing needs.

2. The ratio of total external debt to GDP

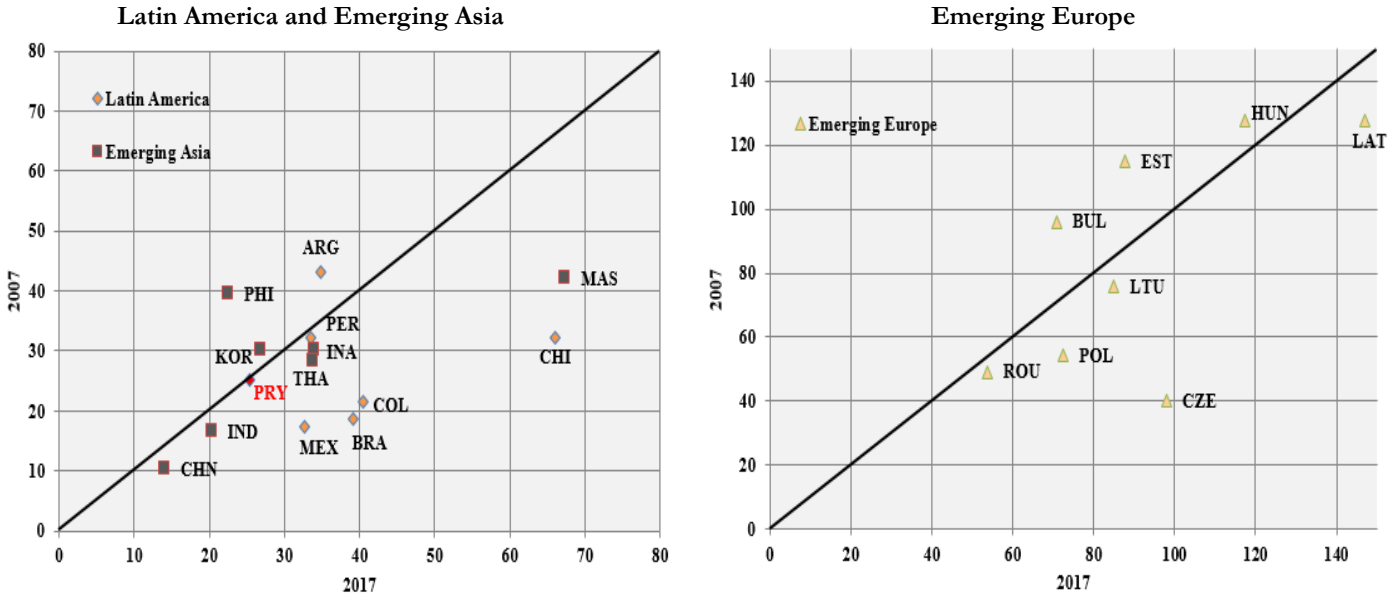
The ratio of total external debt to GDP is used as an indicator of a country's overall capacity to meet its external obligations. Both public and private debts are included. This *stock* variable can be taken as a *solvency* indicator.

Chart 6 compares the behavior of this variable in 2007 and 2017. Countries above the 45-degree line are those whose ratios of external indebtedness have declined in the period since the global financial crisis. Those below the 45-degree line have an increased external indebtedness ratio, and, therefore, are more vulnerable to adverse external shocks. Changes in this ratio are mostly relevant for highly indebted countries.[10] By reducing their

[10] While emerging market economies can indeed benefit from issuing debt in international capital markets, *high* indebtedness ratios can expose countries to shocks that reduce their capacity to service their outstanding obligations. While there is abundant debate on what constitutes *excessive indebtedness*, I do not take a position regarding a *threshold* since there are many factors affecting a country's indebtedness capacity. It is concerning,

dependence on external debt, such countries can reduce their vulnerability to a severe external shock that lowers their income growth and, therefore, their capacity to make good on their external obligations. Highly indebted countries positioned below the line are more vulnerable in this regard.

Chart 6: Total external debt / GDP
(in percentages)



Source: Own elaboration based on The World Bank -IMF, Quarterly External Debt Statistics

Because of large differences in scale, countries in Emerging Europe are presented in the panel on the right-hand side. Emerging Europe remains by far the region with the highest external debt ratios. Although current external financing needs, as reflected by the current account balances, have reduced significantly, the *stock* of debt and debt burden remain extremely high in most countries; this is a legacy from the crisis in this region and is a large source of vulnerability, as indicated by recent reports from the International Monetary Fund.

Among Latin American countries, Paraguay stands out for showing a low and very stable debt ratio.[11] This contrasts significantly with most other countries in the region, including Brazil, Paraguay's most important trading partner. Indeed, due to significant increases in corporates' external indebtedness, debt ratios in a number of countries (Chile, Colombia, Mexico and Brazil) have doubled in the period from 2007 to 2017; with Chile reaching the

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however, when external debt ratios increase at *fast rates* and reach levels that may be sustainable for advanced economies (since their debt obligations can be issued in the currency they issue), but are not so for emerging market economies (whose currencies lack deep markets as they are not highly traded internationally)

[11] The ratio does not include the external debt of binational companies (two hydroelectric plants, one co-owned with Argentina and the other with Brazil). If that debt is included, the ratio increases to 58 percent by 2016, as reported by the IMF (2017). The external debt of binational companies, however, has been on a consistent declining trend.

highest ratio in the region. As a result, and from the perspective of this indicator, Latin America as a whole not only increased its vulnerability to external shocks, but also became more vulnerable than countries in Emerging Asia (except for Malaysia).[12]

3. The ratio of short-term external debt to gross international reserves

The ratio of short-term external debt to gross international reserves captures the degree of liquidity constraints. Facing an adverse external shock, countries need to show that they have resources immediately available to make good on payments due in the period following the shock. The need to have *proof of liquidity* is essential for emerging markets since they cannot issue *hard currencies*; that is currencies that are internationally traded in liquid markets. Thus, large accumulation of foreign exchange reserves and limited amounts of short-term external debt significantly help emerging markets maintain their international creditworthiness and, therefore, contain the impact of a shock.[13]

Short-term debt is defined as debt with a maturity of one year or less. Like the previous chart, countries below the 45-degree line in chart 7 show increased vulnerability to an external shock. Changes in the ratio of short-term debt to international reserves are extremely relevant for all emerging market economies and not only for the highly indebted countries. Even if a country's total external debt ratio is low, it might face significant roll-over risks if most of its debt is short-term and an external shock that curtails access to the international capital markets hits the economy. Under these circumstances, availability of international reserves can make all the difference regarding perceptions of default risk.

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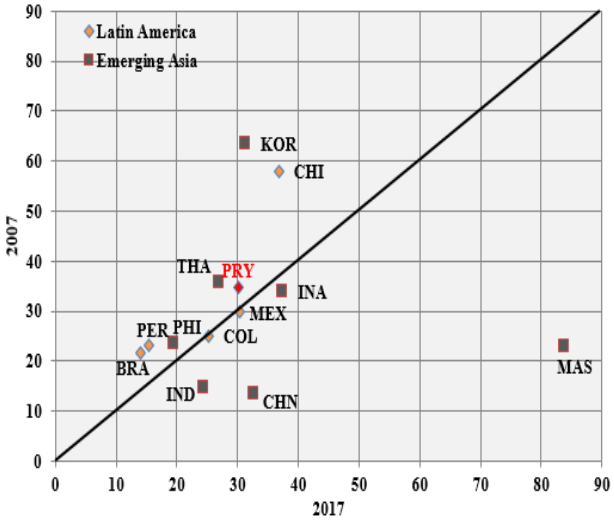
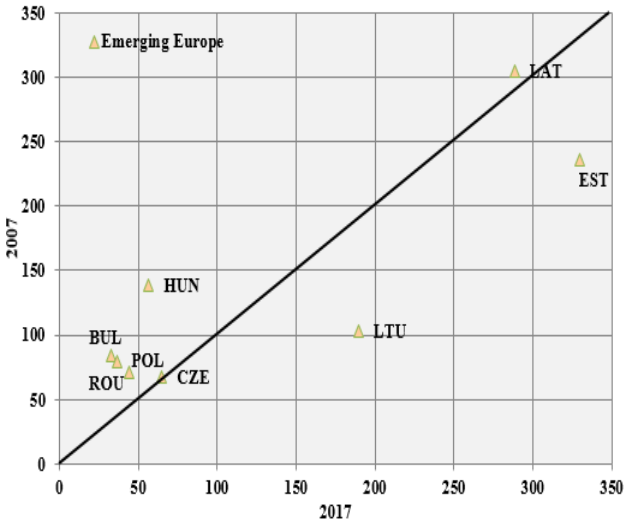
[12] A sharp rise in private sector external indebtedness explains Malaysia's large increase in total external debt.
[13] It is worthwhile to note that the liquidity constraint faced by emerging markets (and not by advanced economies which can issue hard currencies) cannot be resolved by full exchange-rate flexibility. The reason is that, facing an adverse external shock, even a sharp depreciation of the exchange rate cannot generate sufficient resources (through export revenues) fast enough to meet external amortizations and interest payments due. This explains: (a) the huge accumulation of international reserves by most emerging markets and (b) the choice of *increased but not fully flexible* exchange rate regimes followed by a number of emerging market economies. See Rojas-Suarez (2013).

Chart 7: Short-term external debt / Gross international reserves (in percentages)

Latin America and Emerging Asia[a]



Emerging Europe



[a] Argentina is excluded from the graph due to the large value of its ratio
Source: Own elaboration based The World Bank -IMG Quarterly External Debt Statistics

The panel on the right displays countries in Emerging Europe, while the one on the left displays the rest of the emerging market economies in the sample.[14] Noteworthy in this chart is that, by mid-2017, a number of Latin American countries, especially Chile, had improved (reduced) their ratio of short-term debt to international reserves relative to the pre-global crisis period. For Chile and Brazil, this is significant in the context of the increased total external debt to GDP shown in chart 6. That is, while the total external debt ratios have deteriorated in these two countries, the large accumulation of international reserves is playing a central role in providing self-insurance against the vagaries of the international capital markets, as they provide the necessary liquidity to make good on obligations due during or shortly after the eruption of an adverse shock.[15]

Paraguay's short-term external debt ratio has also improved. Because of the sustained accumulation of international reserves, these assets are about three times the value of short-

[14] Since adhesion to the Eurozone contributes to the resilience of individual countries in Emerging Europe to external shocks, the contributions of foreign reserve assets by Estonia and Latvia and Lithuania to the European Central Bank (on January 2011, January 2014 and January 2015, respectively) have not been subtracted from these countries' international reserves.

[15] An additional observation from the chart is that Malaysia and Argentina (not shown in the chart) stand out for their large vulnerability to external shocks, but for different reasons. In Malaysia, the large increase in total external debt (chart 6) has taken place through short-term indebtedness. In Argentina, the ratio of short-term debt to reserves has been improving since 2016, but it still has a long way to go to reach sound levels due to the large loss of international reserves that took place during the previous Administration. After over a decade lacking access to international capital markets, Argentina regained access to these markets at the end of 2015 by reaching a settlement with holdout creditors (see IMF 2016).

term external debt. This, combined with a low ratio of total external debt (chart 6), implies that Paraguay's external debt stance is solid.

4. An indicator of export concentration

The degree of export concentration is measured through the Herfindahl-Hirschmann Index (HHI). The indicator helps to assess a country's capacity to contain the effect of a sharp decline in the price of a major export product. This is particularly important for countries, such as those in Latin America, that export commodities given the secular decline in world prices of these products and their high price volatility, implying (for countries dependent on them) substantial vulnerability to terms of trade shocks. Thus, the more diversified the export basket (less concentration), the greater the resilience to adverse trade shocks.[16]

The index takes values from 0 to 1. Higher values of the index denote higher degrees of export concentration. In contrast to the three macro variables discussed above, whose values can fluctuate significantly from one year to the next, export concentration can be considered a *structural* variable, as it usually takes a long time to change a country's exports composition.[17] Thus, we measure this variable as the three years moving average of the HHI.[18]

Chart 8 shows that Emerging Europe and Emerging Asian countries display the lowest values of the concentration index. In contrast, Latin America shows higher degrees of export concentration, with Colombia, Chile and Paraguay taking the highest values among the countries in the sample.

---

[16] We only consider export concentration in terms of products. However, it would also be useful to assess export concentration in terms of trade partners.

[17] The following normalized HHI, taken from United Nations Conference on Trade and Development (UNCTAD) is used to obtain values between 0 and 1:

$$H_j = \frac{\sqrt{\sum_{i=1}^{n}\left(\frac{x_{ij}}{X_j}\right)^2} - \sqrt{1/n}}{1-\sqrt{1/n}}$$

where:

H_j = country index

x_{ij} = value of export for country j and product i

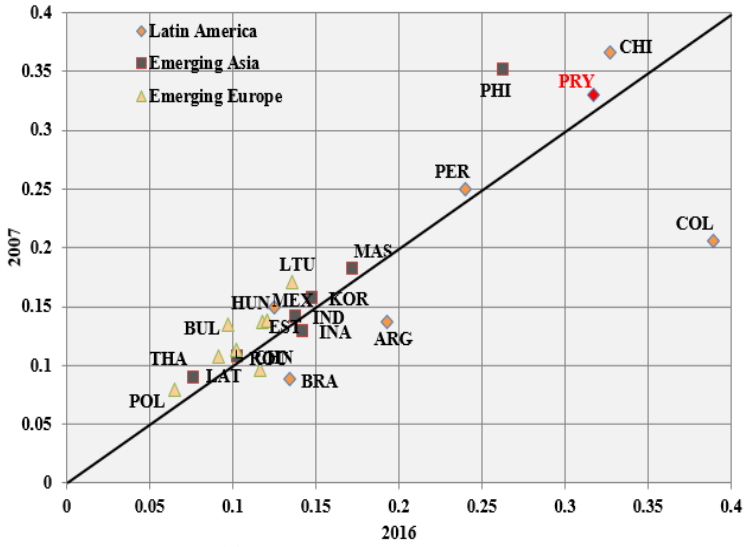
$$X_j = \sum_{i=1}^{n} x_{ij}$$

and

n = number of products (SITC Revision 3 at 3-digit group level).

[18] The UNCTAD data ends in 2015, so the values for this year are taken as a proxy for 2016

Chart 8: Export concentration
(Herfindahl-Hirschmann Index)



Source: Own elaboration based on UNCTAD trade indicators

While in recent years, there has been a slight improvement in the concentration index in Paraguay, the value remains very high, especially given the high volatility in the prices of its commodities exports (soy and derivatives, cereal and beef account for about 75 percent of exports). This is an important source of fragility in the face of external shocks.

In addition, Paraguay also displays a high degree of concentration in terms of trade partners (a variable not analyzed in this paper) that adds to the country's sources of fragility.

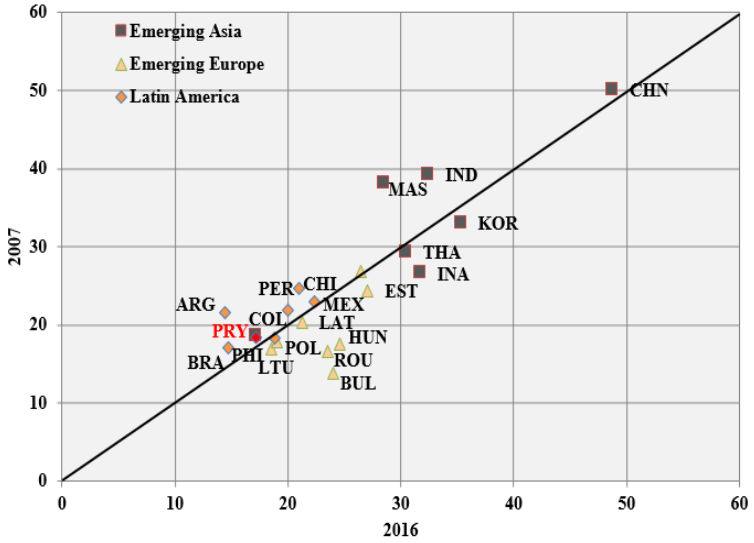
5. National Savings as a ratio of GDP

The four variables discussed above reflect the soundness of a country's external position. The national savings ratio[19] (discussed here) and the indicator of financial depth (discussed in the next sub-section) measure the extent to which available local financial resources (public and private) can, at least partially, offset the reduction of external funding resulting from an adverse shock. This is crucial for economic resilience since a country's stock of capital requires funding to grow (or even maintain it at a constant level). Both are structural variables and, therefore, are measured as a 3-year moving average. The national savings ratio is a flow variable, while the financial depth indicator is a stock variable.

[19] Both the current account (which equals the difference between savings and investment) and the national savings ratios can be used as separate indicators of resilience since the former measures a country's overall external financing needs while the latter measures a country's capacity to finance the existing stock of capital (see Gros and Mayer, 2010). For a given current account value, there are infinite combinations of savings and investment values.

Chart 9 compares the behavior of the national savings ratio at end-2016 relative to the pre-global crisis period.[20]

Chart 9: National savings / GDP
(in percentages)



Source: World Bank national accounts data, and OECD National Accounts data files

The chart confirms a well-documented result among emerging markets, Asian countries report the highest savings ratios (Philippines is the exception). Some of them have even increased these ratios in the decade after the global financial crisis. Another well-established result is that countries in Latin America are among those with the lowest savings ratios.

By 2016, Paraguay joined Argentina and Brazil in displaying the lowest savings ratios among countries in the sample. In Paraguay, the ratio has slightly deteriorated relative to the pre-global crisis period (the data point is slightly above the 45 degrees line). However, the ratio improved in 2016 and the IMF (2017) projects further improvements in 2017-18. Low savings ratio limits Paraguay's resilience in the presence of persistent adverse external shocks.

6. Financial depth

The indicator of financial depth, a stock and structural variable, measures the capacity of the formal financial system (banks and non-bank financial institutions) to provide financing to the economy. The stance in this paper is that advances in capital market development

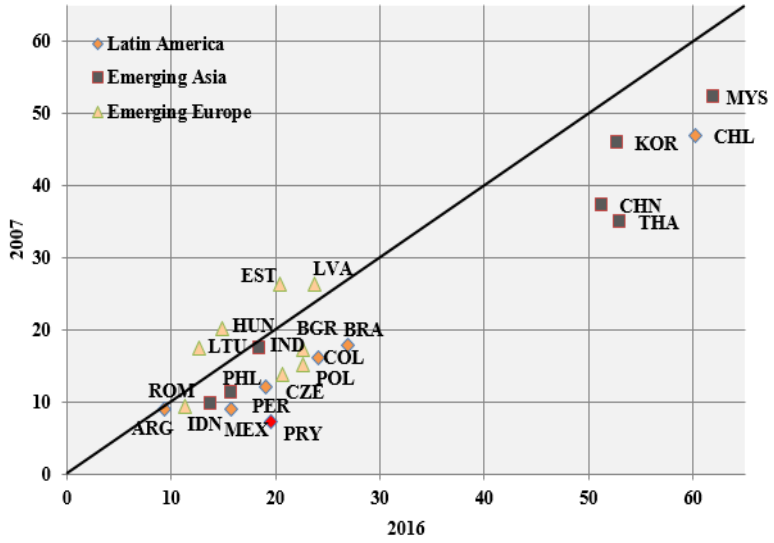
[20] Gross national savings are calculated as gross national income less total consumption, plus net transfers. For 8 countries, including Paraguay, we took the gross national savings directly from the IMF Staff reports if the ratios did not match the World Bank data

complement banking finance in providing a shield against large and sudden reversals of external funding.

To construct this variable, we took three of the four variables classified as *Financial Institutions Depth* in the papers by Sahay et al (2015) and Svirydzenka (2016). The three variables are: (a) the ratio of credit to the private credit to GDP; (b) the ratio of pension fund assets to GDP; and (c) the ratio of insurance premiums (life and non-life) to GDP.[21] The data is taken from the World Bank Global Financial Development Database. The fourth variable not included in this paper is the ratio of mutual fund assets to GDP. This variable was excluded because the database does not provide information for Paraguay.

The indicator of financial depth used here is the simple average of the three components and is graphed in chart 10. Annex I presents graphs for each of the components of the indicator. Except for the ratio of private credit to GDP, where there is data for 2016, the latest available information is for 2015.

Chart 10: Indicator of financial depth (percentages)



Source: Own elaboration based on World Bank Global Financial Development Database, IMF-IFS and IMF (2017)

Consistent with their high savings ratios, most Asian countries show very high ratios of financial depth and these ratios have increased since the global financial crisis (the data points are below the 45 degrees line). Thus, based on this indicator, a number of Asian countries have improved their resilience to external shocks in the last decade.

[21] The term *insurance premiums* refer to the premiums received (in the case of life or health insurance) or earned (in the case of property or casualty insurance) by the insurance company in the previous calendar year. The ratio of insurance companies' assets to GDP is not used due to lack of comparable information across countries.

Improvements in financial depth are also observed in Latin American countries, but, excepting Chile, from very low levels. The improvements mostly derive from increases in the ratio of credit to GDP (all countries, albeit at different degrees) and in the ratio of pension fund assets to GDP (Colombia, Mexico Peru and Chile[22]). While improving in most countries in the region, the ratio of insurance premium to GDP has remained low.

In the case of Paraguay, the significant increase in banking intermediation has resulted in an improvement in the variable of financial deepening over the last decade. In this country, the pension funds ratio has not improved and the ratio for insurance premiums remains at very low levels—the lowest among countries in the sample. On an overall basis, in terms of financial depth, Paraguay still lags significantly relative to most emerging markets.

V. The second dimension of macroeconomic resilience: The authorities capacity to *rapidly respond* to the effects of a shock

A country's capacity to quickly react to an adverse external shock fundamentally depends on its officials' capacity to implement countercyclical fiscal and monetary policies. Therefore, the variables included here relate to a country's fiscal and monetary positions. The fiscal position is characterized by two variables: the fiscal balance as a ratio to GDP (a flow variable) and the ratio of government debt to GDP (a stock measure). The monetary position is characterized by three variables that I explain further below: (a) *the deviation of inflation from its announced target* (b) *a measure of financial fragilities,* which evaluate whether the desired monetary stance is consistent with price and financial stability, and (c) financial dollarization.

1. The ratio of general government fiscal balance to GDP[23]

Countries with strong fiscal accounts *before* an external shock will be in a better position to undertake countercyclical policies than those with large fiscal deficits. This argument is significantly more important for emerging market economies than for advanced economies because the latter have the capacity to finance deficits through placement of government debt in domestic liquid capital markets. As shown in chart 10 and Annex I, most emerging markets lack such an advantageous option.

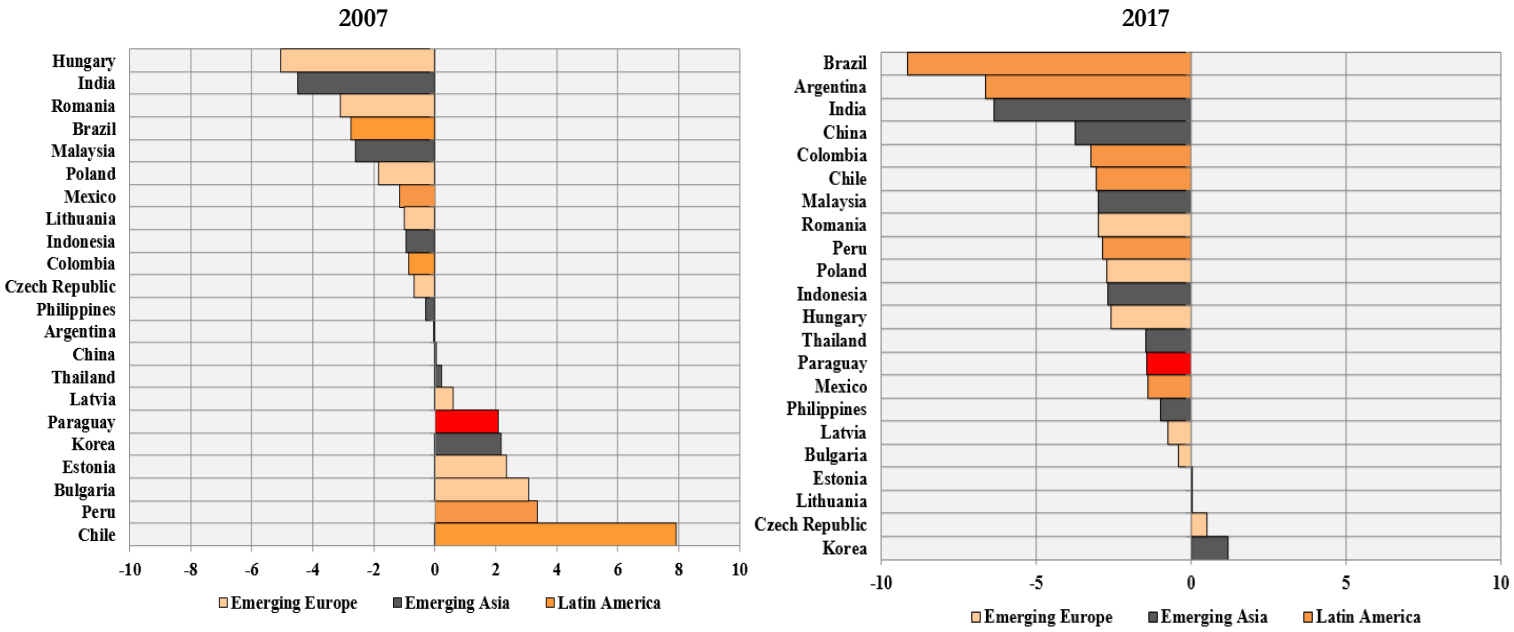
Chart 11 shows a dramatic turn of events in fiscal positions since the global financial crisis. In 2007, a significant number of countries could face the crisis with strong fiscal positions. Chile stood out by its large fiscal surplus which served the country well, as it could undertake

[22] Chile (and Malaysia) are not included in the graph on pension fund assets (Annex I) because the ratios of these two countries are much larger than the rest of the countries in the sample. By 2015, Chile's pension fund assets had reached 70 percent of GDP. This compares with about 61 percent in 2007. Malaysia's ratio increased from 48 to 59 percent during the same period.

[23] A broad concept of the fiscal stance is chosen because of significant differences in aggregations of the fiscal accounts across countries

a significant increase in government spending during the global crisis, without compromising macroeconomic stability. Paraguay and Peru were also in a strong footing. In the aftermath of the shock, the Paraguayan authorities were able to successfully implement countercyclical fiscal policies. Thanks to the significant fiscal surpluses in the pre-crisis period, the authorities had the fiscal space to increase government spending, especially on investment and conditional cash transfer programs (IMF, 2010).

Chart 11: General government fiscal balance / GDP (in percentages)



Source: IMF-WEO

In contrast, except for Hungary, Lithuania, Romania and Czech Republic, all emerging market economies experienced weaker fiscal positions during 2017. Only Czech Republic, Estonia, Lithuania and South Korea showed fiscal surpluses.[24] The fiscal positions in Brazil, Argentina and India are particularly noteworthy and a source of concern by authorities in these countries. Even China, a country of global systemic importance, has shown a significant deterioration of its fiscal balance.

The broad fiscal deterioration can be partly explained by adverse external factors that have hit emerging markets since 2013, especially the commodity exporters, since the negative impact on economic activity has contributed to a decline in tax collection. However, as discussed above, lack of needed reforms at the national level is also hurting fiscal balances at a time when the external environment is less favorable for growth.

[24] Estonia and South Korea also had surpluses in 2007, but they were much larger than the corresponding surpluses in 2017

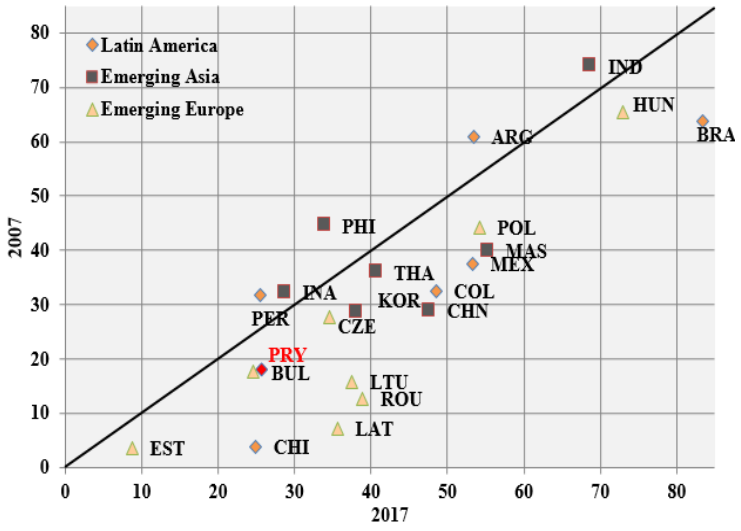
Among regions, Latin America shows the largest deterioration of fiscal balances. Among Latin American countries, however, Paraguay and Mexico display the lowest fiscal deficits. Relative to most emerging markets in the sample, Paraguay has a better fiscal position and, given the government's low debt ratio (to be discussed below), the authorities' fiscal space to undertake countercyclical fiscal policies has not reduced as much as most other Latin American economies. Somehow ironically, however, the current version of the Fiscal Responsibility Law, aimed at containing large fiscal imbalances, may constrain the implementation of countercyclical fiscal policies. This is because, among other requirements, the Law establishes a maximum deficit of 1.5 percent of GDP; and the forecasted deficit for 2017 (IMF (2017) is almost at that limit (1.4 percent). In this regard, a consideration by the government of alternative fiscal rules (including a rule on the structural fiscal balance) combined with the establishment of a stabilization fund is highly appropriate.

2. The ratio of government debt to GDP

The ratio of government debt to GDP also signals a government's capacity to undertake countercyclical fiscal policies. Even if the fiscal balance is strong, authorities may be reluctant to undertake net fiscal expansions to counteract the contractionary effect of an external shock on the economy, if the outstanding stock of debt is significantly large, as the expansion might aggravate the debt problem.

As with the other debt variables discussed here, countries below the 45-degree line in chart 12 show an increase in vulnerability to external shocks relative to 2007. Consistent with the deterioration in fiscal balances, most governments in the sample have increased their debt ratios. Indeed, some of the countries that displayed the highest ratio of government debt to GDP in 2017 (with forecasted values taken from the IMF-WEO)—India, Brazil, Argentina, Malaysia, and Poland—are also among the countries with the highest fiscal deficits in that year (chart 11). China is also among the countries with the largest deterioration in the government debt ratio. In the last decade, the ratio has increased by about 70 percent.

Chart 12: General government debt / GDP
(in percentages)



Source: IMF-WEO

Although the government debt to GDP ratio has increased in Paraguay, especially in recent years, this ratio remains among the lowest in emerging markets. In contrast to Brazil, Paraguay's main trading partner, the increase in government's indebtedness in Paraguay is not perceived as a vulnerability: Starting from a very low ratio (less than 20 percent in 2007), the government has had ample space to issue sovereign bonds for the financing of infrastructure projects since 2013, without compromising fiscal sustainability. Government indebtedness could become a source of concern if the upwards trend were to continue and become steeper (especially in the context of the low development of local capital markets); however, neither the 2018 budget nor forecasts by multilateral organizations suggest that public debt would encounter sustainability issues in the foreseeable future.

3. The deviation of inflation from its announced target

Deviation of inflation from its announced target captures the constraints imposed on the implementation of countercyclical monetary policy when the economy is facing inflationary or deflationary pressures *at the time of the shock*. For example, if the adverse external shock is manifested in a shortage of bank liquidity and a reduction in the expansion of domestic real credit, central bankers might wish to reduce their policy rate. This policy, however, might not be chosen if the economy is facing high inflation rates since the reduction in interest rates would fuel inflationary pressures further. Likewise, the external shock might call for an increase in the interest rate; but this policy action might not be implemented if the economy is facing significant deflationary pressures.

To measure inflationary (or deflationary) constraints faced by central banks to conduct countercyclical monetary policies, the variable used here is defined as the weighted average of the deviation of inflation from its target over the last 6 months, with higher weights attached to the most recent months; this tries to capture the inflation dynamics of the recent

past. There are two additional features of the variable. First, the estimations are conducted in absolute values to reflect that large deviations, positive or negative from the target are considered pernicious for the implementation of countercyclical monetary policy. Second, it is also assumed that the inflation restriction on the capacity to implement countercyclical monetary policy is non-linear: the larger the deviation from the target, the greater the constraint on monetary policy.[25] [26]

Chart 13 presents the results of these calculations and compares countries' position in the pre-crisis period (2007) and at 2017. Countries positioned below the 45-degree line have greater deviation from inflation targets in mid-2017 than in 2007. Countries in Emerging Europe are displayed on a separate panel (on the right) because of the differences in scale (in 2007) compared to the rest of emerging market economies in the sample.

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[25] This methodology differs somehow from the one used in Rojas-Suarez (2015). There, the variable was defined as the squared value of the deviation of inflation from its target.

[26] Specifically, for every country and point in time, the variable was constructed as follows:

Step 1: Estimation of the monthly deviation of inflation from the announced target. We use a non-linear approach to indicate that large deviations, positive or negative, are considered proportionally more constraining for the implementation of countercyclical monetary policy.

$$\hat{\pi}^d = 100 * [e^{|\pi - \pi^t|} - 1]$$

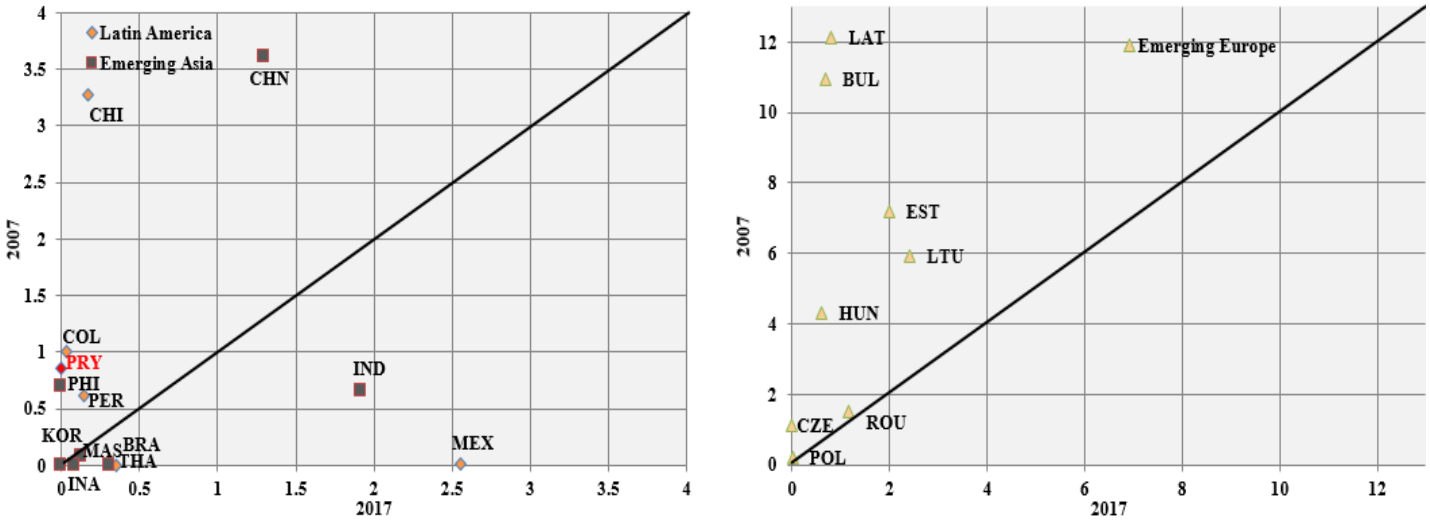
where $\hat{\pi}^d, \pi, \pi^t$ refer to the inflation deviation, current inflation rate and inflation target respectively.

In cases where there is a target range, we use the upper threshold (π^u) instead of π^t when $\hat{\pi}^d$ exceeds the range, and the lower threshold (π^l) is used when a country falls below the range.

Step 2: Estimation of the 6-months weighted average of $\overline{\pi}^d$:

$$\overline{\pi}^d \text{ (weighted average)} = \sum_{i=0}^{5} \frac{\pi^{d[t-i]}}{2^{i+1}}$$

Chart 13: Deviation of inflation from its target[a]



[a] Argentina is excluded because of the large value of the variable
Source: own elaboration based on central banks and other national sources, IMF

There are two noticeable developments in the chart. The first is the sharp correction of inflation by countries in Emerging Europe that were experiencing high inflation in 2007 (Bulgaria, Estonia, Hungary, Latvia, and Lithuania).[27] The second is that except for a few countries, by 2017 most emerging markets in Asia and Latin America were close to or on their inflation targets.[28]

The reasons behind convergence toward targets, however, were very different. For example, while inflation has been decelerating in Brazil largely because of weak economic activity (the country showed a negative output gap by 2017), the monetary authority in Paraguay has been able to keep inflation on target in the context of sound economic growth. The adoption of an inflation targeting regime in Paraguay in 2011 has supported the conduct of appropriate monetary policy and is a sign of strength regarding economic resilience.[29]

Argentina stands out among countries in the sample. While inflation has been declining in the last year, the rate remains very high and reached 25 percent by end-2017. Because of the high rate, Argentina is not included in the chart (however, the inflation variable is included in the calculation of the overall resilience indicator below). If it were, it would be positioned far to the right below the 45-degree line.[30]

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[27] While not presented in the chart, due to recessionary pressures after the global financial crisis, inflation rates in Emerging Europe were extremely low and even reached negative values in some countries. 2017 marked the first year since 2013 when all the countries in this group reported positive inflation rates.

[28] Mexico's departure from its inflation target in 2017 is associated with the lagged effects of the significant depreciation of the peso since 2014, the liberalization of energy prices and increases in the minimum wage in early 2017.

[29] Authorities in Paraguay had in place an *experimental phase* of inflation targeting from 2005 to 2011.

[30] The central bank's inflation target ceiling for 2017 was 14.5 percent.

4. A measure of financial fragilities characterized by the presence of credit booms (excessive expansion of credit) or busts (collapse in the rate of growth of real credit)

Financial-sector fragilities, manifested either by an unsustainable credit expansion (credit *boom)* or a significant lack of credit to support economic activity (credit *bust*), are a major constraint on the conduct of monetary policy. For example, an adverse external shock, even if temporary, might expose existing financial vulnerabilities in the banking sector associated with an excessive credit expansion (a credit boom) and, as a result, severe banking problems might emerge. As resolving banking difficulties is a long process, the central bank might be pressed to reduce interest rates and keep them low for a significant period (to contain the increase of nonperforming loans). This is even when, in the absence of banking problems, adequate conduct of monetary policy would call for an increase in interest rates after a short period of time following the shock.

To capture the extent of this obstacle for the conduct of monetary policy, for each country in the sample, it is necessary to identify the thresholds on real credit growth that determine whether an observed growth in real credit can be associated with a *boom* or *bust*. For this purpose, the methodology of Mendoza and Terrones (2008) is followed.

An indicator of Financial Fragility: *FinFrag* is calculated according to the following formula:

$$FinFrag = \left(\Delta RC^{boom} - \Delta RC_t\right) * \left(\Delta RC_t - \Delta RC^{bust}\right)$$

Where: ΔRC_t is the growth rate of real credit in period *t*; ΔRC^{boom} is the threshold on credit growth for credit *boom* and ΔRC^{bust} is the threshold on credit growth for credit *bust*.[31]

If the economy is in neither a credit *boom* nor a *bust*, the observed growth rate of real credit (ΔRC_t) would be greater than the threshold for the *bust* (ΔRC^{bust})and lower than the threshold for the *boom* (ΔRC^{boom}). In that case, the indicator *FinFrag* would take on a positive value.

If, instead, the economy is experiencing a credit boom, ΔRC_t would be greater than ΔRC^{boom} and *FinFrag* would take on a negative value.[32]

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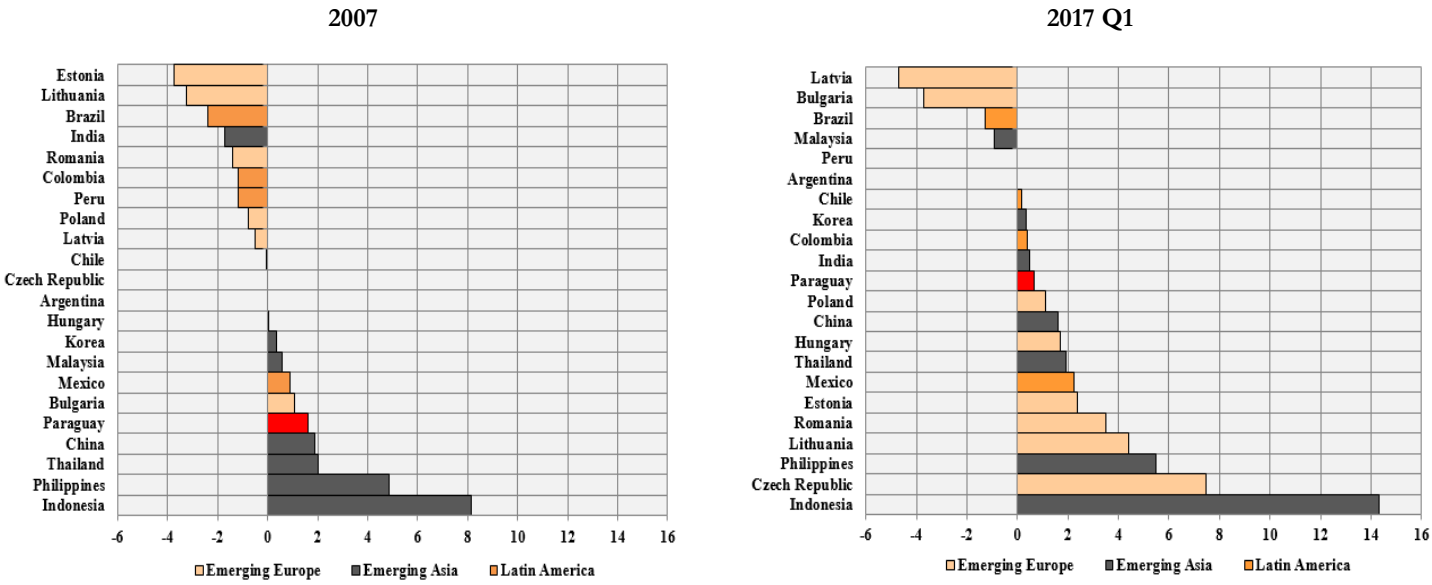
[31] To compute thresholds, Mendoza-Terrones (2008, 2012) use the Hodrick-Presscott (HP) filter to calculate the cyclical component of the log of real credit. Here, the HP filter is used to calculate the cyclical component of the growth of real credit. The thresholds for credit booms and busts for each country are then defined as the standard deviation of this cyclical component for the entire sample period, multiplied by 1.5 and -1.5 respectively. The sample period to calculate the thresholds for each country depends on data availability and the absence of an important regime change. In most cases, the sample period goes from the first quarter of 2000 to the first quarter of 2017. In the case of the Asian countries the sample period begins in the first quarter of 1992.

[32] This hold true because, by definition of credit *booms* and *busts,* ΔRC^{bust} is necessarily lower than ΔRC^{boom},

Alternatively, the economy might be in a credit bust. In that case, ΔRC_t would be lower than ΔRC^{bust} and *FinFrag* would take on a positive value.

The estimation of this indicator for the countries in the sample for 2007 and 2017 (first quarter) is presented in Chart 14. According to the results, all countries where the indicator took a negative value in 2007 were experiencing credit booms. Most countries in Emerging Europe belonged to this category,[33] together with a few others, such as Brazil, Colombia and Peru which were also experiencing excessively fast real credit growth in the pre-global financial crisis year. While real credit was rapidly growing in Paraguay in the pre-global crisis period, it did not surpass the threshold for a boom. Facing the global crisis shock, the authorities were able to implement countercyclical monetary policy.[34]

Chart 14: Indicator of financial fragility[a]



[a] Negative number indicates the presence of a credit boom or bust
Source: own elaboration based on IMF-IFS and BCP

By mid-2017, credit conditions were significantly different from those in 2007. The most vulnerable countries were still in Emerging Europe (Latvia and Bulgaria), but this time these economies were experiencing credit stagnation rather than *booms*. If an additional external shock bringing about further contractionary effects were to hit these economies, central banks might face serious difficulties for the effectiveness of countercyclical policies as the impact of the shock would add to the already depressed real credit growth.

---

[33] As discussed above, unrealistic expectations about a rapid entrance to the euro zone (and the associated expected increase in net worth) fueled a rapid expansion of real credit in these economies and weakened their financial positions.

[34] During the global financial crisis, the central bank: (a) reduced reserve requirements; (b) lowered the policy interest rate and (c) introduced a short-term liquidity facility (see IMF (2009))

Paraguay and most other Latin American countries also experienced real credit deceleration in early 2017, but for very different reasons. For example, Brazil joined Latvia and Bulgaria in experiencing a credit bust and this reflected serious economic imbalances, consistent with major political disruptions and a resulting crisis of confidence that persisted at the time of this writing. In contrast, in Paraguay, the deceleration of real credit since 2015 reflected the adverse impact of the decline in commodity prices, and in the second quarter of 2017 real credit growth had started to turn around. In Paraguay, the behavior of real credit has not imposed a significant constraint on the implementation of monetary policy.

5. Dollarization

Financial dollarization, measured as financial institutions' holding of assets and liabilities denominated in foreign currency is widely recognized as a source of financial vulnerability and a constrain on the effectiveness of monetary policy. First, in highly dollarized economies, a sharp depreciation of the local currency has the potential to significantly weaken the balance sheet position of banks' borrowers holding dollar-denominated loans but earning local currency-denominated income, to the extent that these currency mismatches are not adequately hedged. As with the *financial fragility* indicator, discussed above, deterioration in banking soundness may press the central bank to expand liquidity beyond what would be desirable in the absence of banking difficulties.

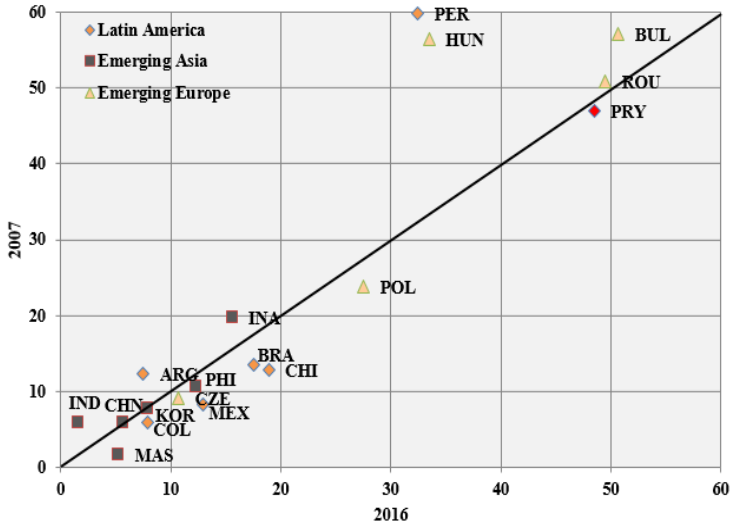
Second, a high level of dollarization may reduce the *effectiveness* of monetary policy since the presence of a large percentage of assets denominated in foreign currency limits the central bank's capacity to affect market interest rates.

The variable used to measure dollarization in this paper is the ratio of dollar-denominated loans to total loans.[35] Since dollarization can be considered a structural variable (significant changes take time to materialize), we construct a 3-years moving average series as the relevant values for the variables. Chart 15 presents this ratio in the pre-global crisis period at the end of 2016.[36]

[35] The ratio of foreign currency deposits to total deposits is a complementary measure of dollarization.

[36] Data come from different sources. The main source is the IMF's Financial Soundness Indicators (FSI) database. When data from a country was missing, we complemented with data from the BIS's Currency Mismatch PDF sent by BIS staff (e.g. China) and from national sources (e.g. Peru, Paraguay and India). Data was overall uniform from 2007 to 2016. Nevertheless, in some cases there was data missing at the beginning or at the end. For example, there was no data for Bulgaria in 2007, but there was for 2008. In this case, we input the 2008 value into the 2007 missing observation. Also, we decided not to consider values for Estonia, Latvia and Lithuania: after they started using the euro, dollarization ratios fall dramatically, which do not represent their true resilience. For these three countries, therefore, the dollarization variable was not included in the calculation of the overall indicator of resilience.

Chart 15: Dollarization: Dollar-denominated loans/total loans



Source: own elaboration based on IMF—Financial Soundness Indicators and Staff Reports; BIS and national sources

There are two important results from the chart. The first is that countries can be divided in two groups: those with low degree of dollarization (most emerging countries in the sample) and those that are highly dollarized; with ratios of dollar-denominated loans to total loans above 30 percent by end-2016. Paraguay belongs to the second group.

The second result is that most countries are close to the 45 degrees line; meaning that their degree of financial dollarization has not changed significantly in the last decade. Two notable exceptions are Hungary and Peru. The latter reduced its dollarization ratio by almost half.

Although Paraguay's credit dollarization declined significantly in the early 2000s, it increased again in the aftermath of the financial crisis. Risks associated with currency mismatches are, however, contained because a significant part of borrowings in dollars corresponds to the agribusiness industry, whose revenues are denominated in dollars and, therefore, have a natural hedge. Notwithstanding, other sectors also undertake dollar borrowing with incomplete hedging; therefore, risks to financial sector stability associated with high dollarization persist in Paraguay. Moreover, constraints to the effectiveness in the transmission of monetary policy, due to dollarization, limits the efficacy of the central bank to respond countercyclically to an adverse external shock, hindering Paraguay's resilience to these shocks.

Reducing financial dollarization further is neither an easy nor a short-term task. The international experience shows that even when financial stability is credibly achieved, financial dollarization, while decreasing, often persists. Under these circumstances, it is advisable to put in place microeconomic measures that support a trend toward de-dollarization while containing the risks of remaining financial dollarization. Incentives to promote deep and liquid local-currency bond markets can provide alternatives to dollar deposits. However, this objective has proven challenging for many emerging economies and

is a long-run goal.[37] In the relatively short-term, the policy of actively managing reserve requirements (RRs) can yield desirable results. Peru is a case in point. To induce *de-dollarization*, the differential between RRs on dollar-deposits and RRs on soles-deposits has remained very high (between 20 to 25 percentage points). Moreover, the remuneration of RRs on dollar-deposits has been kept at below market rates and modified according to changes in the behavior of dollar-denominated credit.[38] Keeping in mind the sharp reduction in financial dollarization in Peru, it would seem worthwhile to analyze whether the particularities of the Peruvian management of asymmetric reserve requirements can be appropriate for Paraguay.

VI. An overall indicator of resilience: How does Paraguay compare?

Each of the eleven variables discussed above presents a partial view regarding the resilience (in terms of financial stability and economic growth) of emerging market economies to external shocks. Some countries showed improved strength in some variables, but not in others, in 2017 relative to the pre-crisis period. Yet, in other countries, many of the variables signal a deteriorated resilience. In this section, I construct an indicator that combines all the variables to provide a better overall picture of *relative* economic and financial resilience between countries.

Consistent with the discussion in section III, the indicator is formed by four groups of variables (four sub-indicators) that represent the two dimensions of resilience. The first two groups correspond to the first dimension and the last two to the second dimension:

- The External Position: ratio of current account to GDP, ratio of total external debt to GDP, ratio of short-term debt to international reserves and the indicator of export concentration.

- Availability of Domestic Sources of Finance: national savings as a ratio of GDP and the indicator of financial depth.

- The Fiscal Position: general government fiscal balance as a ratio of GDP and the ratio of government debt to GDP.

- The Monetary Position: deviation of inflation from its announced target, the indicator of financial fragility and the ratio of dollar-denominated loans to total loans (dollarization).

The indicator is constructed using a simple methodology, which is a modified version of Rojas-Suarez (2015). First, to make all the variables within the indicator comparable, each

[37] As shown in chart 10 Paraguay's financial depth is very low relative to many other emerging markets.
[38] In particular, the remuneration has been lowered when the expansion on dollar-denominated credit has been assessed as too large.

variable is standardized, subtracting the cross-country mean and dividing by the standard deviation. Second, variables whose increase in value signals a reduction in resilience (an increase in vulnerability) are multiplied by –1. Those variables are: total external debt to GDP, short-term external debt to gross international reserves, export concentration, government debt to GDP, the deviation of inflation from its target and dollarization. Third, each of the four sub-indicators is constructed by taking the simple average of the standardized variables that form the group. Finally, the overall indicator is simply the average value of four sub-indicators.[39] This methodology, of course, implies that we analyze *relative* economic and financial resilience among countries in the sample.

A caveat to our methodology is that by grouping the 11 variables into the equally weighted four categories, some individual variables are assigned greater weights than others. For example, since the current account ratio belongs to a category containing 4 variables, its individual weight is lower than the fiscal balance ratio which belongs to a category formed by only 2 variables. While an alternative aggregation methodology attaching equal weights to all variables is certainly a valid exercise, our preferred approach is based on the framework presented in section III where the main proposition is that there are four pillars defining the two dimensions of resilience. We equally weight those four pillars, rather than the components of the pillars.[40]

Table 2 presents the results from the exercise.[41] The values of the indicator for 2007 and 2017 are presented as well as the country rankings in both years. According to this methodology, the greater the value of the indicator, the more resilient a country's economic and financial conditions to external shocks are assessed to be.

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[39] Alternatively, each sub-indicator indicator could have been constructed by adding the values of the standardized variables (as in Gros and Mayer, 2010)

[40] However, it's worthwhile noticing that in the alternative exercise (not shown here), where all the variables are equally weighted, the overall value of the indicator does not change significantly for most countries. In particular, for Paraguay the value of the indicator in 2007 changes from 0.04 (see table 2) to 0.05 (the indicator ranges from -0.83 to 0.86 in the alternative exercise). The value of the indicator for Paraguay in 2017 changes from -0.12 (table 2) to -0.11.

[41] As discussed in section V, the dollarization variable is not included in the computation of the overall indicator of resilience for Estonia, Latvia and Lithuania.

Table 2: Resilience indicator

	2007		2017	
	Value of the Indicator	Country Ranking	Value of the Indicator	Country Ranking
Latin America				
Argentina	-0.38	16	-0.93	22
Brazil	-0.29	15	-0.73	21
Chile	0.74	2	0.15	8
Colombia	-0.05	11	-0.27	18
Mexico	0.09	8	-0.09	11
Paraguay	0.04	9	-0.11	12
Peru	-0.08	12	-0.11	13
Emerging Asia				
China	0.89	1	0.66	3
India	0.01	10	-0.21	17
Indonesia	0.23	6	0.27	6
South Korea	0.69	3	0.86	1
Malaysia	0.63	4	0.31	5
Philippines	-0.20	13	-0.01	10
Thailand	0.58	5	0.80	2
Emerging Europe				
Bulgaria	-0.38	17	-0.01	9
Czech Republic	0.13	7	0.47	4
Estonia	-0.40	18	0.17	7
Hungary	-0.87	22	-0.32	19
Latvia	-0.53	20	-0.48	20
Lithuania	-0.56	21	-0.13	14
Poland	-0.24	14	-0.16	15
Romania	-0.41	19	-0.20	16

Source: Own elaboration

The country rankings for 2007 accurately reflect the observed effects of the global financial crisis on emerging markets. That is, the values of the resilience indicator in the pre-crisis period were a good predictor of the relative strength of countries to deal with the global crisis of 2008. In other words, supporting the premise in this paper, *initial conditions mattered, and mattered a lot*. For example, as has been widely documented, the countries in Emerging Europe were the most affected, both in terms of economic growth and financial stability, by the crisis. This is precisely what the resilience indicator reveals since the last positions in the ranking were occupied by countries in Emerging Europe. In contrast, most of the Asian countries remained strong, led by the quick policy response of China to the crisis. Indeed, China occupied the first place in the ranking in the pre-crisis period. The strength of its

economic and financial position *before the crisis* allowed for the implementation of effective countercyclical policies following the eruption of the crisis.

Latin American countries took positions in the middle of the rankings and showed large variation between countries, with Chile taking second place and Argentina in position sixteen. Paraguay ranked ninth thanks to its efforts since 2003 to strengthen the fiscal balance and bring inflation down. This served the country well to undertake countercyclical policies in 2008-09. However, while the strength of Paraguay's macro variables supported the authorities' *capacity to deal* with the global crisis, weaknesses in structural variables constrained the country's *resilience to withstand the impact* of external shocks. For example, Paraguay's high degree of export concentration played a role in the recession that ensued in 2009, following a severe drought, that affected exports drastically, exacerbating the adverse effects of the global crisis. Moreover, the country's low ratios of savings and financial depth (among the lowest in our sample of countries) did not support economic activity. Using the framework in this paper, it can be concluded that weaknesses in the structural variables forming the first dimension of economic resilience limited Paraguay's capacity to withstand the external shock, while the second dimension proved to be quite strong and facilitated the adequate and prompt reaction of the authorities.

To further gauge the importance of weaknesses in structural variables in constraining Paraguay's overall resilience to external shocks, Table 3 presents the resilience indicator excluding the structural variables; that is, only macro variables (current account ratio, the external debt ratio, the ratio of short-term debt to international reserves, the fiscal position, the government debt ratio, the deviation of inflation from target and the indicator of financial fragility) are included. The methodology used to construct this modified indicator is like the one used for the overall resilience indicator. The only difference is that the seven macro indicators are weighted equally to form the modified version.[42] As shown in columns 1 and 2 of Table 3, the result is striking for Paraguay: Because of the strength of its macroeconomic variables in 2007, Paraguay was the second strongest country in the sample (only surpassed by Chile). Clearly, deficiencies in the structural variables relegated Paraguay to ninth place in Table 2.

Turning to 2017, in the context of large uncertainties in international capital markets, including those arising from the effects of normalization in US monetary policy and the protectionist threats from some advanced economies, we can ask a similar question to that posed for the pre-global financial crisis. How resilient are emerging markets to a new adverse external shock? Has Paraguay's resilience relative to other emerging markets improved or deteriorated? And what variables of the resilience indicator best explain Paraguay's results?

Columns 3 and 4 of Table 2 deal with these questions. Countries marked in green are those that have improved their ranking since 2007 by two positions or more. Likewise, countries marked in red are those whose ranking have deteriorated by two positions or more.

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[42] The macroeconomic variables are no longer grouped in four categories.

While the relatively more resilient countries are still in Emerging Asia (the three best positions are in that region), the results do not deliver good news for Latin America: all countries in the region, including Paraguay, have deteriorated their positions in the ranking and now Argentina and Brazil occupy the worst positions. As discussed above, the Latin America outcome derives from a combination of deteriorated terms of trade and, perhaps more importantly, a missing opportunity to implement needed reforms during the post-crisis years (2010-2013). In contrast, Emerging Europe can be characterized as the most improved region since the value of the resilience indicator has increased in these countries and their relative positions have improved (the exception is Poland). In Emerging Europe, policies and reforms put in place to correct for the large economic imbalances during the pre-global crisis period are paying off.

What explains the significant decline in the value of the resilience indicator for Paraguay and its associated deterioration in the ranking? The answer is twofold. First, since the indicator measures *relative resilience* between countries, it favors countries that pass meaningful structural reforms. Paraguay remained among the worst performers in structural variables (as shown in charts 8, 9, 10 and 15), while countries in Emerging Europe passed reforms that yielded large improvements on the structural front. Second, some of the macro variables in Paraguay deteriorated following the terms of trade shock. In particular, the current account deteriorated sharply and the fiscal balance worsened. Thus, in contrast to 2007, both dimensions of economic resilience had deteriorated by 2017

Once again, Table 3 provides additional insights into the distinction between macro and structural variables. Columns 3 and 4 show the countries' value of the indicator and ranking position in 2017 under the alternative methodology that includes only macro variables. The results for Paraguay are clear cut: because of its deteriorated macro performance, the country's value of the indicator and its position in the ranking declined; but only from position 2 in 2007 to position 4 in 2017; that is, in terms of *relative* macroeconomic resilience Paraguay continued being one of the strongest countries among emerging markets. The reason is that, relative to most other countries, Paraguay's current account and fiscal stance experienced a smaller deterioration and the authorities managed to keep inflation on target. Notice that Paraguay (and Peru, to a lesser extent) is unique among Latin American countries: weaknesses in macroeconomic variables in Argentina, Brazil, Chile, Colombia, and Mexico have greatly contributed to their fall in in the rankings. This is particularly noticeable in Argentina and Brazil (which maintain two of the lowest positions in the ranking).

Table 3: Resilience indicator—only macro variables

	2007		2017	
	Value of the Indicator	Country Ranking	Value of the Indicator	Country Ranking
Latin America				
Argentina	-0.36	17	-1.04	22
Brazil	-0.18	14	-0.66	20
Chile	0.81	1	0.05	11
Colombia	0.15	11	-0.07	14
Mexico	0.36	8	-0.04	12
Paraguay	0.76	2	0.51	4
Peru	0.40	7	0.20	7
Emerging Asia				
China	0.58	3	0.11	9
India	-0.09	13	-0.40	19
Indonesia	0.54	4	0.34	6
South Korea	0.44	6	0.72	1
Malaysia	0.33	9	-0.07	13
Philippines	0.22	10	0.35	5
Thailand	0.49	5	0.72	2
Emerging Europe				
Bulgaria	-0.40	18	0.13	8
Czech Republic	0.12	12	0.55	3
Estonia	-0.91	20	-0.09	16
Hungary	-1.00	21	-0.20	18
Latvia	-1.16	22	-0.90	21
Lithuania	-0.65	19	-0.14	17
Poland	-0.19	15	-0.08	15
Romania	-0.23	16	0.05	10

Source: Own elaboration.

From the exercise above, the importance of structural reforms to improve Paraguay's economic resilience to adverse external shocks is conclusive. An additional exercise, shown in Annex II reinforces this conclusion. There, we have added an additional structural variable to the sub-indicator for the fiscal position: the ratio of tax revenues to GDP, which measures the capacity of the government to fund existing investment projects in the event of an adverse shock that reduces or reverses external sources of funding. As shown in the table in Annex II, Paraguay's relative position in the ranking deteriorates dramatically in 2017 in comparison to 2007: eight positions in this *expanded* resilience indicator. Mexico is the other country in Latin America, whose position in the ranking gets severely affected by the

inclusion of this variable.[43] This is because, as shown in the chart in the Annex, Paraguay and Mexico are among the countries with the lowest ratios of tax collection.

VII. Concluding remarks

Even under optimistic growth scenarios, it will take Paraguay many years to close its income per capita gap relative to advanced economies. Thus, to keep climbing up the ladder of economic development, the country cannot afford to deviate from a sustained growth path. Building up resilience to growth-deterring external shocks is, therefore, imperative.

Expanding on Rojas-Suarez (2015), this paper constructs an indicator of resilience to external shocks which has two dimensions: the first refers to the capacity of an economy to *withstand the impact* of a shock while the second signals the capacity of national authorities to *quickly respond* to its adverse effects. By applying the methodology of the resilience indicator to 22 emerging market economies, this paper reaches two main conclusions for Paraguay.

The first is that the authorities' efforts to improve the country's macroeconomic stance since 2003 have paid off and will continue to do so if a new adverse external shock hits the economy. During the global financial crisis, the authorities had the fiscal and monetary space to implement countercyclical policies, minimizing the overall effect of the shock. An analysis of the macro variables in recent times shows that their relative (to other countries) strength has persisted, and in some cases, such as the behavior of inflation under an inflation targeting scheme, has even improved. From the perspective of the second dimension of resilience, just as in the pre-global crisis period, Paraguay is now one of the most resilient countries among emerging markets. Nevertheless, reductions in financial dollarization could further support the effectiveness of countercyclical monetary policy in the presence of a shock. Consideration to a more intensive and proactive use of asymmetric reserve requirements is advised. The success of this policy in Peru to reduce dollarization deserves attention.

The second conclusion is that the first dimension of resilience, the economy's capacity to withstand the impact of a shock, was not very strong in the pre-global financial crisis period and, relative to other emerging markets, has not improved since then. The reason is that most of the structural variables included in the overall *Resilience* indicator (export concentration, national savings ratio and financial depth) are components of the first dimension of resilience and are in need of improvement. For example, in 2009 a severe drought affected the agribusiness sector and, in the context of highly concentrated exports, compounded the adverse effects of the global financial crisis, triggering a recession. As of today, Paraguay has one of the highest ratios of export concentration among emerging markets. Paraguay's savings ratio is also among the lowest in emerging markets and financial depth (due to underdeveloped capital markets) lags significantly relative to its peers.

[43] The relative position of Peru in the ranking for 2017 is also affected, but the effect on tis county is significantly less than that on Paraguay and Mexico.

In a nutshell, the results of this paper call for a prompt implementation of structural reforms in the key identified areas. Absence of these reforms severely limits the benefits of a strong macroeconomic stance to deal with the adverse effects of external shocks.

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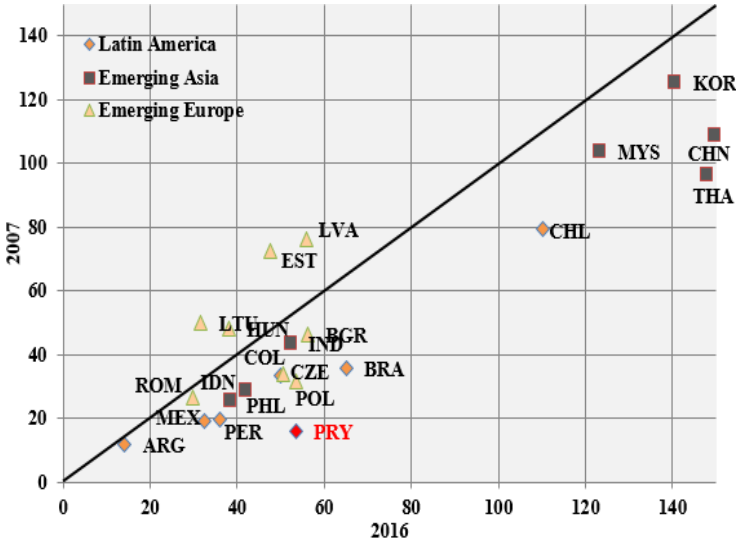
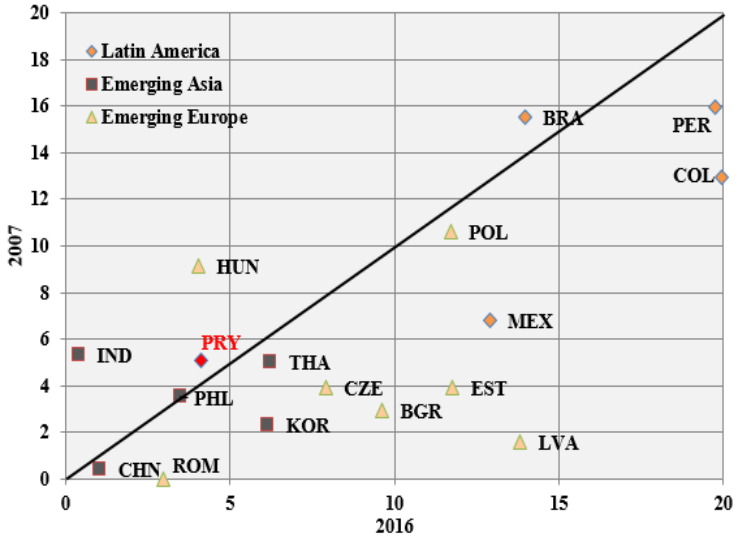
Annex I: The components of the financial depth indicator

Credit to the private sector/GDP
(percentages)

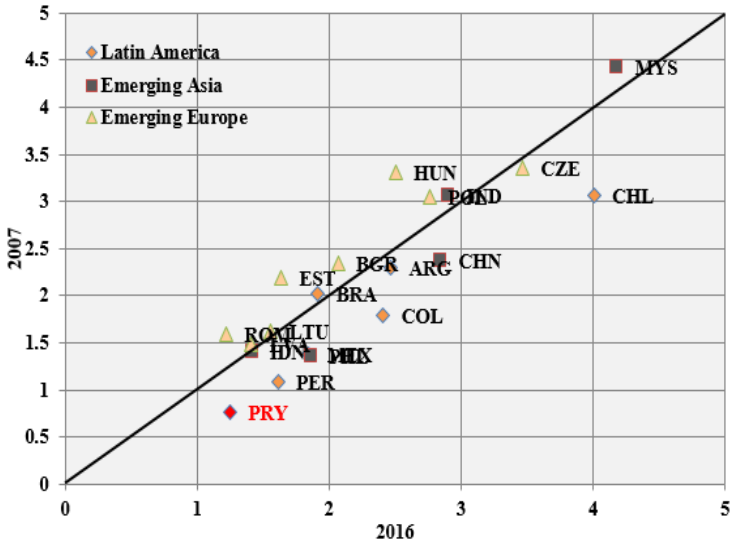


Pension fund assets/GDP[a]
(percentages)



[a] Chile and Malaysia are excluded due to the large values of their ratios

Insurance Premiums/GDP[a]
(percentages)



[a] Korea is excluded due to the large values of their ratios
Source: Own elaboration based on World Bank, Global Financial Development Database and IMF (2017)

Annex II: Adding an extra variable to the resilience indicator: Tax revenues as percentage of GDP[44]

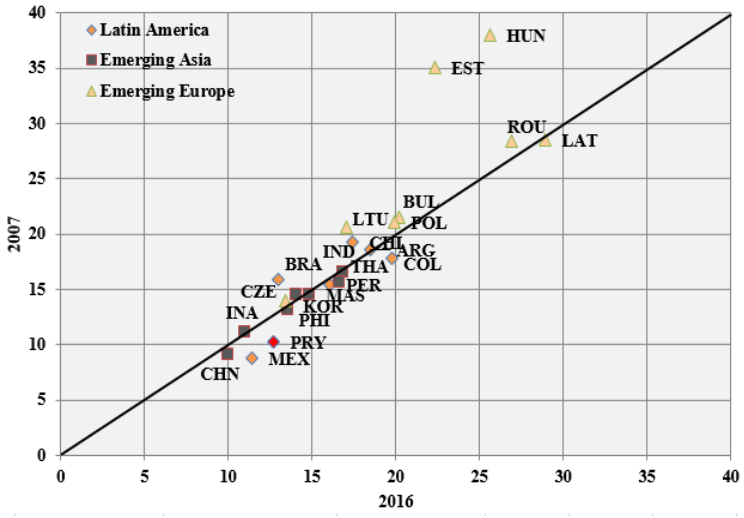
An expanded overall resilience indicator—including tax revenues/GDP

	2007		2017	
	Value of the Indicator	Country Ranking	Value of the Indicator	Country Ranking
Latin America				
Argentina	-0.32	18	-0.82	22
Brazil	-0.22	14	-0.59	21
Chile	0.57	4	0.13	8
Colombia	-0.05	10	-0.20	18
Mexico	0.01	9	-0.18	16
Paraguay	-0.12	11	-0.24	19
Peru	-0.17	13	-0.17	15
Emerging Asia				
China	0.78	1	0.58	3
India	0.14	7	-0.09	12
Indonesia	0.16	6	0.14	6
South Korea	0.60	3	0.74	2
Malaysia	0.64	2	0.31	5
Philippines	-0.23	15	-0.12	14
Thailand	0.55	5	0.77	1
Emerging Europe				
Bulgaria	-0.43	19	-0.04	9
Czech Republic	0.08	8	0.34	4
Estonia	-0.32	17	0.13	7
Hungary	-0.53	21	-0.11	13
Latvia	-0.49	20	-0.34	20
Lithuania	-0.56	22	-0.19	17
Poland	-0.16	12	-0.08	11
Romania	-0.30	16	-0.04	10

Source: Own elaboration

[44] The data for this variable is taken from the World Bank. Tax revenue refers to compulsory transfers to the central/federal government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue. All the data points were cross-checked against IMF staff reports and replaced in the event of discrepancies. These included all the Eastern European countries, India, and Colombia. Bulgaria's tax revenue was constructed using central bank data.

Tax Revenues/GDP
(in percentages)



Source: World Bank and IMF staff reports