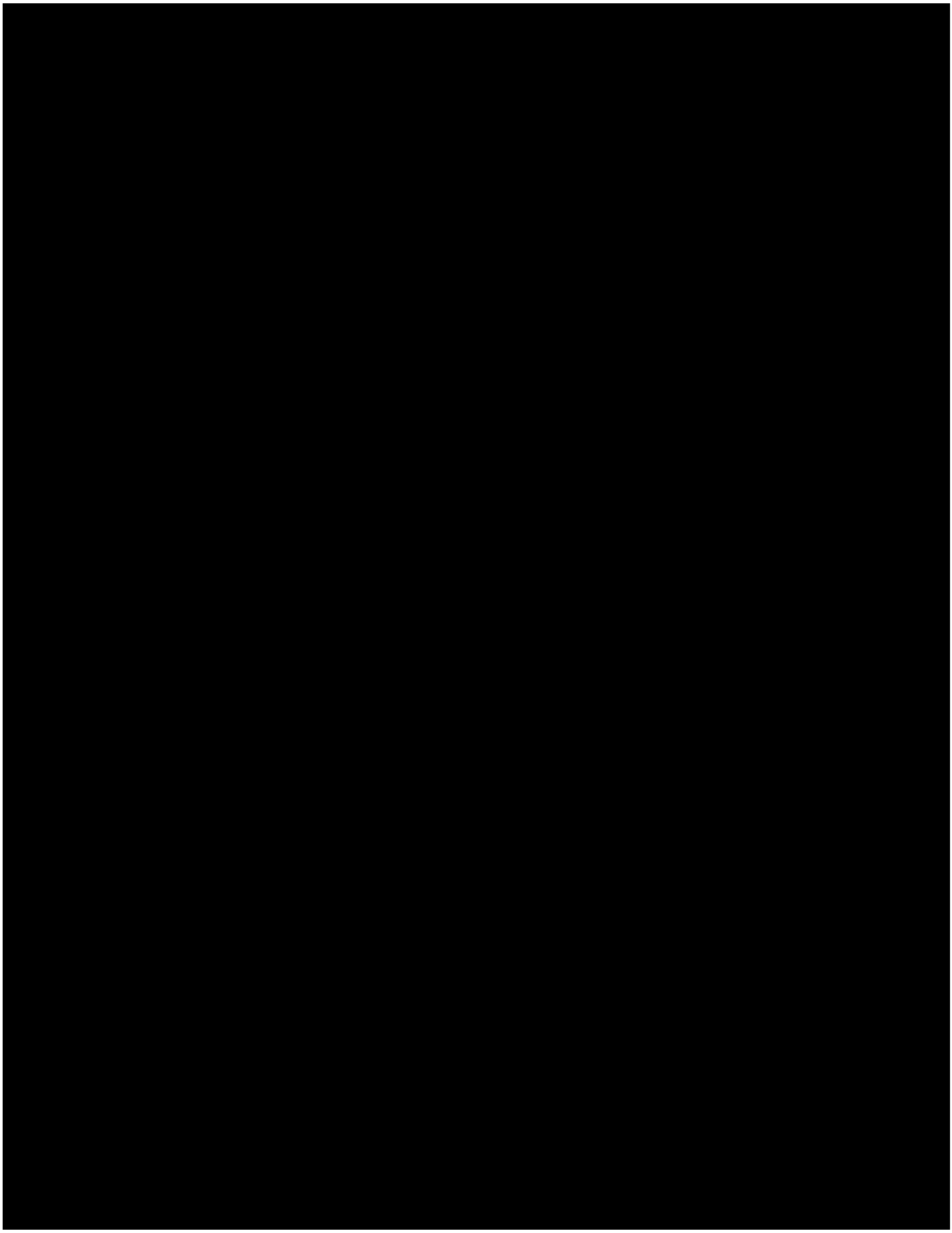

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A Balancing Act: Reform Options for Paraguay's Fiscal Responsibility Law[1]

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Abstract

Paraguay faces a trade-off between building fiscal credibility and amending the existing fiscal rule to accommodate infrastructure investment and provide space for countercyclical policies. In this paper, we discuss several alternative fiscal rules for Paraguay and present simulations of debt trajectories in each case, assuming a baseline and three deterministic shock scenarios. We provide a supplementary Excel file to replicate debt simulations under different fiscal rules. The results suggest that potential modifications to make the fiscal rules more flexible in Paraguay should be accompanied by a number of safeguards that enhance credibility of the fiscal anchor and preserve sustainability.

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I. INTRODUCTION

Over the first year of Paraguay's fiscal responsibility law (FRL), implementation has proven challenging and a debate has emerged over whether its current design is excessively rigid. The enactment of the Fiscal Responsibility Law in 2013, which came into force in 2015, was a major achievement for the country toward strengthening its fiscal framework and institutionalizing fiscal discipline. In addition to numerical targets, the law has also introduced elements of medium-term budgeting and greater transparency. However, fundamental issues have emerged both with respect to its implementation and design. First, amid legal questions, implementation of the FRL has been complex—with the 2015 budget exceeding the deficit ceiling by a noticeable margin. Second, there is growing concern that under the current design of the rule with its comparatively low deficit ceiling and limited escape clauses, capital expenditure plans will need to be adjusted to ensure compliance, possibly to the detriment of overall economic development prospects in light of the sizeable infrastructure needs and the relatively low public debt levels. The international experience suggests that excessively rigid fiscal rules tend to be abandoned (Schaechter, Kinda, Budina, and Weber, 2012).

At the same time, there are important reputational costs to amending the framework. The law acknowledges that one of the main benefits of fiscal rules is to build the confidence of markets and economic agents by insulating fiscal policy from political considerations. In that context, credibility is a crucial aspect of the framework, especially given the authorities' aims to institutionalize fiscal discipline that would help achieve aspirations of attaining investment-grade status for the sovereign. Given the short track record of compliance, however, changes to the law could affect market perceptions of policy credibility. Thus, any changes to the fiscal anchor should be managed and communicated carefully and should be accompanied by concrete measures to strengthen fiscal institutions and preserve the sustainability of public finances.

Hence, Paraguay faces a trade-off between building credibility and amending the existing rules to accommodate infrastructure investment needs and provide additional space for countercyclical policies. This paper will analyze these trade-offs in light of the international experience with fiscal rules. The paper is organized as follows. Section II reviews the implementation of the current FRL in Paraguay and provides an assessment of ex-ante and ex-post compliance with numerical targets. Section III examines Paraguay's fiscal rules from a comparative perspective drawing lessons from international experience. Section IV discusses the trade-offs inherent to five alternatives that could be considered by authorities when contemplating a revision of the headline deficit ceiling. Section V presents the results of simulations of four different rules under a baseline and three deterministic shock scenarios, which are assessed based on their relative performance in terms of the central government debt trajectory and capital expenditures. Section VI, discusses implementation issues stemming from changes in the rules. Finally, Section VII contains the main conclusions and policy recommendations.

II. IMPLEMENTATION OF THE FRL IN PARAGUAY

A. Main features of the FRL

The main targets are a headline deficit ceiling for the central government of 1.5 percent of GDP and a limit on real current primary expenditure growth of 4 percent for the entire public sector. It is understood by authorities that compliance should be judged based on adhering to these ceilings in the budget approved by congress rather than on the basis of fiscal outturns.[2] Regarding the wage bill, the FRL states that any eventual salary increases for civil servants will be limited by the percentage increase in the minimum wage. In addition, the FRL has an ex-ante (indicative) restriction on the average deficit over three consecutive years presented in medium-term budget plans, which must not exceed 1 percent of GDP. Table 1 provides a summary of these targets and other features of the FRL.

Moreover, the FRL has clearly defined, but narrow escape clauses. The headline deficit ceiling can reach up to 3 percent of GDP in cases of national emergency; international crises; or negative growth. This increase would require congressional approval and in some cases a report by the central bank and the approval of the national economic team.

The Comptroller General is responsible for monitoring compliance with the law and sanctions in the case of breaches are based on personal accountability.[3] The agency responsible for assessing compliance is, appropriately, independent from the Ministry of Finance. However, the Comptroller General may not be best suited operationally for monitoring compliance, because it follows the established practice of a general audit of all government finances, and necessarily comes with a significant delay (up to 9 months after the close of the calendar year). This arrangement is unsuitable to flag deviations from the FRL in a timely manner, which should be communicated during budget execution to help enforce the law. As far as sanctions are concerned, the law states that breaches would be deemed as a dereliction of duty by the civil servants responsible and the appropriate sanctions under the relevant law would be applied. It is not entirely clear who the responsible civil servants are or who might determine responsibility.

The FRL has contributed to strengthen fiscal frameworks by introducing elements of medium-term budgeting and enshrining greater transparency. Article 5 of the law mandates open access to reports produced by government agencies (with some exceptions, as established by law). Article 6 incorporates medium-term fiscal programming in the elaboration of budget documents. A medium-term fiscal plan (covering the next three years) as well as a debt sustainability analysis have to be presented to congress together with the draft annual budget law.

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[2] For example, authorities do not use fiscal outcomes to assess compliance with the expenditure rule of the FRL. Compliance is based on a comparison of the implied growth in current primary expenditures for the public sector in the approved budget for year t+1, relative to the prevailing budget as of June of year t, deflated by the mid-point of the BCP's inflation target band.

[3] Article 4 of the law states that "The three state powers, and their dependencies, will be responsible for the compliance with the principles and rules established in the law."

Table 1. Main Features of the Fiscal Responsibility Law

Deficit ceiling	1. The deficit of the central government must not exceed 1.5 percent of GDP. 2. The average deficit (budgeted) over three consecutive budget periods must not exceed 1 percent of GDP. This rule only applies to the ex-ante medium-term budget plan.
Expenditure ceiling	The growth rate of current primary expenditure for the public sector must not exceed 4 percent in real terms.
Escape clauses	Congress can approve a deficit of up to 3 percent of GDP in cases of national emergency; international crisis affecting the domestic economy; or negative growth.
Sanctions	Any eventual breach is deemed a dereliction of duty by the civil servant responsible.

B. An Assessment of Compliance

In 2015, FRL compliance has been challenging and complex, but there are signs of increased effectiveness of the fiscal framework. Amid legitimacy questions about the scope of the law to limit the power of congress to enact budgets that are not in line with its provisions, the 2015 budget exceeded the deficit ceiling by 1.3 percentage points of GDP. In addition, the 2015 Budget Law, on equal legal footing with the FRL, introduced the possibility of excluding capital expenditure (financed by sovereign bonds) from the calculation of the deficit ceiling on a one-off basis.[4]

The draft budget for 2016 submitted to congress complied with the numerical targets of the FRL. The final version approved by congress essentially respected the deficit ceiling, though modifications introduced altered the composition of spending, increasing current primary expenditures. The growth of these expenditures would exceed the 4 percent limit when comparing the approved budget for 2016 to the 2015 fiscal outturn, but not when using the authorities' methodology (Table 2). Crucially, ad-hoc provisions for the exclusion of capital expenditures from the calculation of the deficit ceiling have not been added to the Budget law this time.

In addition, ex-post deviations from the FRL's numerical targets have been observed in 2015 (Table 2). In terms of fiscal outcomes, the fiscal deficit reached 1.7 percent of GDP and growth in real current primary expenditures exceeded the numerical ceiling of 4 percent. Nevertheless, if the one-off exclusion of capital expenditures financed by sovereign bonds from the calculation of the deficit ceiling is invoked, we estimate that the adjusted fiscal deficit would be 0.6 percent of GDP. However, both figures are based on revised accounting rules that provide additional room under the deficit ceiling with certain financial transactions in the public sector treated below the line.[5]

[4] Article 241 of the 2015 Budget law (Ley 5.386/15).

[5] In 2015 authorities fully adopted the presentation of government finances following the GFSM 2001 statistical manual. This allows additional room under the ceiling given that certain financial transactions are not included in the deficit concept (net lending/borrowing), but are moved "below the line" relative to the previous manual. These financial transactions amounted to about 0.5 percent of GDP in 2015.

Table 2. Compliance with the Fiscal Responsibility Law

	2015	2016
	Est.	Approved Budget
In percent of GDP, unless stated otherwise		
Total Revenue	18.4	20.1
Expense	17.6	18.4
Net Acquisition of non-financial Assets	2.6	3.3
Net lending/Borrowing	**-1.7**	**-1.5**
Net lending/Borrowing (excl. bond financed capital expenditures) [1]	**-0.6**	**...**
Real current primary expenditure growth (percent change)[2]	**7.2**	**8.0**
Real current primary expenditure growth (percent change), Authorities [3]	**6.2**	**-2.5**
Memo items:		
Nominal GDP, G$ bn.	144,249	162,819
Current primary expenditure (Central Government), G$ bn	22,539	25,433

Source: Paraguayan authorities and authors' calculations and estimates.

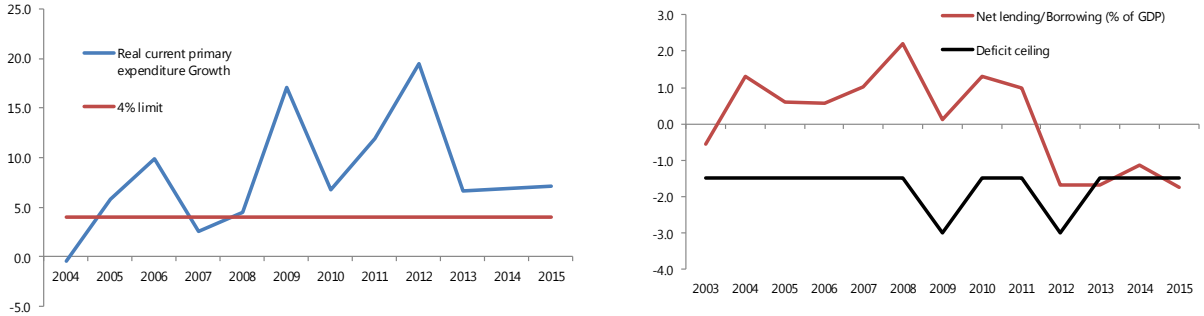
[1] Article 241 of the 2015 budget law (Ley 5.386/15) states that capital expenditure financed by sovereign bonds can be excluded from the calculation of the deficit ceiling in the FRL.

[2] Deflated using the GDP deflator. Based on outcomes for 2015 and projections and approved budget numbers for 2016 for the central government.

[3] Deflated using the mid-range of the CPI inflation target band. Follows authorities' methodology and compares current primary expenditure for the entire public sector in the approved budget for year t+1 to current primary expenditures in the prevailing budget as of June of year t.

Historically, deficits have remained below the current FRL's ceiling, but authorities face difficulties in constraining the growth of real current primary expenditures for the central government. Figure 1 depicts the evolution of real current primary expenditure growth and the fiscal balance against the (counterfactual) targets of the FRL in the period 2003 to 2015. In line with the country's record of fiscal prudence, the fiscal balance has remained within the FRL limit for almost all years. Nevertheless, real current primary expenditure growth for the central government has systematically exceeded the law's ceiling, although with some convergence more recently, illustrating the challenges faced by authorities in constraining these expenditures.

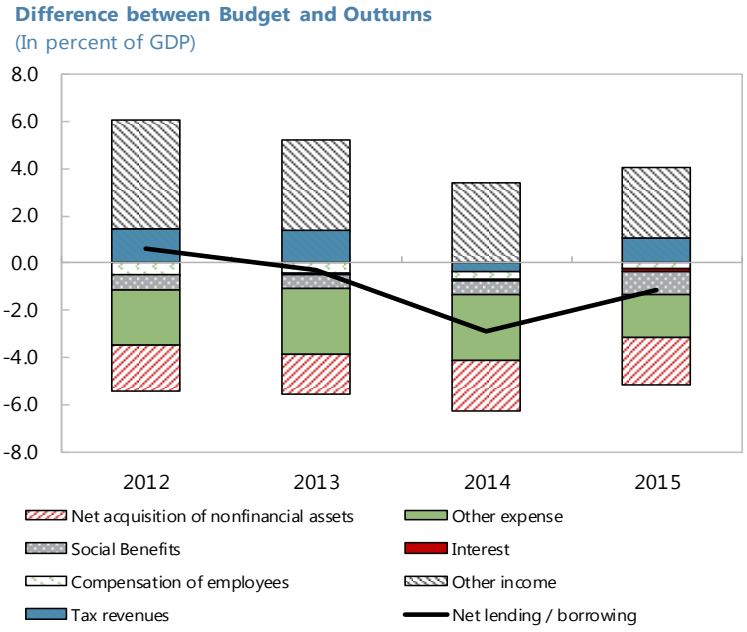
Figure 1. Fiscal Outturns and FRL Parameters



Source: Authors' estimates based on authorities' data. Real current primary expenditure growth refers to the central government.

While the FRL has contributed to strengthening the fiscal frameworks, important challenges remain. Budget projections—which are used for determining compliance with the FRL—have tended to produce systematic errors. Specifically, the practice of presenting optimistic revenue projections along with ambitious expenditure plans that are typically under-executed persists. Figure 2 depicts differences between revenue, expenditures, and the overall balance as presented in Budget documents and the effective outturns for these variables. Budgeted revenues have been systematically higher than realized revenue collection, although the size of the gap has narrowed (in particular for tax revenues).[6] On the expenditure side, there has been under-spending relative to budget targets, in particular for capital investment and transfers (comprised in "other expense" category in the Figure). As a result, deviations for the overall balance have not been large with the exception of 2014 when the budgeted deficit was 3 percentage points of GDP larger than the realized one.

Figure 2.



Source: Authors' estimates based on authorities' data. A positive number for revenue items means that the budgeted item was larger than the revenue outturn. A negative number for an expenditure item means that the expenditure was larger in the budget than in execution. A negative number for the balance means that the deficit was larger (more negative) in the budget than in the outturn.

Despite some progress, congress has not yet fully internalized the implications of the FRL in the budget setting process. Part of the issue concerns legal ambiguity between the obligations under the FRL and constitutional budget authority of the congress. Under the current legal framework, annual budget laws passed by congress are on equal footing with the FRL which can create tensions between them. In that context, amending the fiscal rules under the FRL without further legal clarity on the scope for congress' ability to modify the budget proposed

[6] These large differences have typically been driven by a residual category of other revenue within the broad category of non-tax revenue.

by the executive may run into future difficulties. There is also the risk that any modification proposed by the Executive can be used as an opportunity for congress to further weaken the FRL.

Other barriers to the effective implementation of the FRL surround institutional factors, including spending rigidities and shortcomings in tax administration. Better tax collection and strict control over current expenditure, backed by civil service reform, are critical to create space for higher public investment while limiting the increase in public debt. To that end, improvements in revenue administration, particularly in customs will be crucial. More specifically, the enhancement of rules-based control procedures and transparency as well as better risk management would contribute significantly to boost revenue over the medium-term. As far as tax revenues are concerned, the country's revenue authority (SET) has made good progress in strengthening institutional frameworks and administrative capacity, but still faces a numbers of constraints that undermine tax compliance. In particular, legal procedures for imposing sanctions on tax evasion are weak by international standards. Furthermore, the FRL has imposed limits on public sector wage growth and there have been initiatives to promote competitive hiring, but authorities should pursue systematic civil service reform efforts to reduce spending rigidities and promote efficiency.

III. Lessons for Paraguay from the International Experience with Fiscal Rules

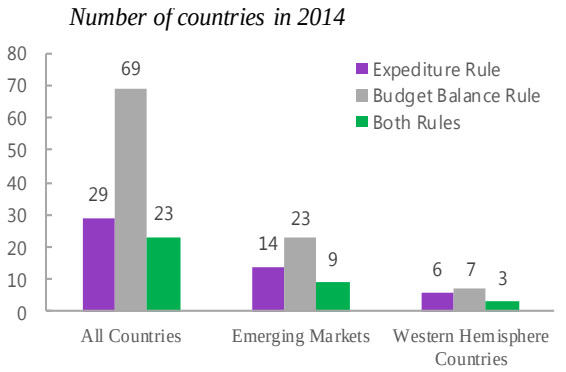
Depending on their needs and objectives, countries have designed and implemented different fiscal rules. International experience suggests that effective fiscal rules typically have the following characteristics (IMF, 2009): i) An unambiguous and stable link between the numerical target and the ultimate objective, such as public debt sustainability; ii) Sufficient flexibility to respond to shocks, so that the rule should at least not exacerbate the adverse impact of temporary macroeconomic shocks; iii) Transparency and a clear correction mechanism, i.e. deviations from numerical targets should be easy to observe and there should be an institutional mechanism to map deviations from these numerical targets into (incentives to take) corrective actions.

Which variables do countries usually constrain? Many countries follow a budget balance rule, an expenditure rule or a debt rule, or a combination of these rules. Some countries also follow so-called "golden rules"[7] that allow for the exclusion of capital expenditures or other infrastructure investment from the fiscal target. In the box below we list some of the advantages and disadvantages of these rules that may be of relevance to Paraguay, given its context of low debt, large infrastructure needs, and aims to strengthen credibility of the fiscal framework.

[7] In this paper we define a golden rule as the exclusion of capital expenditures from the calculation of numerical targets of a fiscal rule. The traditional definition is somewhat narrower and typically states that new borrowing should only be used to finance public investment.

A. Paraguay's FRL in a Comparative Perspective

Several countries currently combine expenditure and budget balance rules, but Paraguay's headline deficit ceiling appears to be comparatively tight. The combination of limits on expenditures and a budget balance rules that characterizes Paraguay's FRL is also currently present in 23 other countries, of which nine are emerging markets. Also, Paraguay's headline budget deficit ceiling appears to be relatively tight when compared to the parameters adopted by other countries following headline budget balance rules at some point in time (Table 3). Typically, countries that have headline deficit ceilings of the same magnitude as Paraguay's had less favorable debt trajectories and faced sustainability concerns.



Source: Authors' calculations based on IMF Fiscal Rules Dataset, 2015.

Table 3. Selected Numerical Budget Balance Rules

Country	Start year	Headline Balance Rule
Canada	1998	Deficit ceiling of 3% GDP
Georgia	2013	consolidated budget deficit ceiling of 3% of GDP
India	2004	Deficit ceiling of 3% GDP (abandoned in 2008)
Indonesia	1985	consolidated deficit ceiling of 3% GDP
Israel	1992	Variable, in normal times overall deficit approx 1.5%
Kosovo	2013	Overall deficit ceiling of 2% of GDP
Montenegro	2014	Deficit ceiling of 3% GDP
Nigeria	2007	Overall deficit ceiling of 3% of GDP
Pakistan	2005	Balanced (current) budget by 2008 and surplus thereafter
Panama	2012	Target budget deficit of 0.5% GDP, coming down from 2.9%
Peru	2000	Targeted 1.5 to 2% deficit, switched to structural balance in 2013

Source: IMF, Fiscal Rules Dataset, 2015

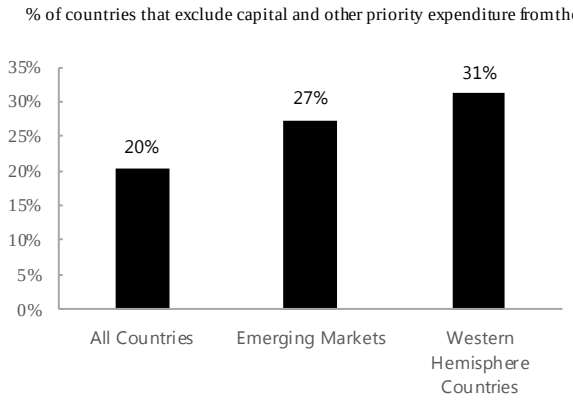
Box 1. Advantages and Disadvantages of Different Fiscal Rules

Expenditure rules (ERs) are relatively simple to implement and allow for automatic stabilizers to work on the revenue side, but do not provide an anchor for longer-term fiscal policy. This type of rule tends to be easy to communicate and monitor and is directly enforceable through the budget process. Nevertheless, ERs do not provide an anchor for longer term policy and could lead to potentially undesirable changes in the structure of expenditures, as expenditures may shift to categories not covered by the rule (Schaechter, Kinda, Budina, and Weber, 2012).

Budget balance rules (BBRs) provide an operational target with direct links to fiscal sustainability, but if given in headline terms, can be procyclical. Although BBR's link to medium-term sustainability is clear, in general, these rules might be vulnerable to off-budget operations or operations that are recorded as financing items. Structural balance rules can yield more favorable results in terms of economic stabilization, but face implementation challenges. The correction for the economic cycle and other factors can be complex, especially in developing countries. These complications also make structural balance rules more difficult to communicate.

Debt rules (DRs) provide a clear anchor for medium-term fiscal policy, but do not offer operational guidance in the short-run. DRs are easy to communicate and monitor, but are vulnerable to shocks outside the control of policy makers, in particular fluctuations in economic growth rates, interest rates, shocks to the exchange rate, as well as contingent liabilities. The average fiscal cost of a contingent liability realization is 6 percent of GDP (Bova et al., 2016). In addition, debt ratios typically only reflect policy slippages with a lag, making it difficult to adopt appropriate remedial actions in a timely manner.

Golden Rules have been adopted by several countries wishing to safeguard investment expenditures. Golden rules are relatively common in the region and among emerging markets more generally. The basic economic rationale behind golden rules is that public investment projects are expected to generate gains over several years and therefore their full costs should not be attributed to one specific year. In addition, the rule takes into account the possibility that borrowing to finance investment may "pay for itself" through user fees and higher tax revenue (IMF, 2014). However, the exclusion of priority investment expenditures typically complicates the implementation of fiscal rules and weakens the link to fiscal sustainability. Golden rules provide incentives for the government to overreport expenditures in the category protected under the golden rule, through creative accounting for example. Moreover, it is likely that an increase in current spending would follow a scale-up in public investment due to the costs associated with maintenance of a higher level of public capital stock. The international experience suggests that the golden rule and its variants protect public investment, but they frequently fail to ensure sustainability of public finances (Caceres and Ruiz-Arranz, 2010; IMF, 2014).



Source: IMF Fiscal Rules Dataset.

B. Enforcement and Sanctions

Most countries with fiscal rules have some form of formal enforcement or sanctions if compliance is violated. Typically, two types of sanctions have been used – budgetary and reputational (see Cangiano et al 2013). Reputational sanctions can include an obligation to publicly explain deviations from the fiscal rule. Budgetary sanctions can include expenditure cuts, withholding of transfers, wage freezes for civil servants or freezes on further borrowing. Success of budgetary sanctions is more likely if they are automatic. Otherwise, if budgetary sanctions are implemented with delay or if they require a decision by congress, the sanction would likely not affect those violating the rule but their successors. In countries, with fiscal councils, independent media or strong academic and policy observers, reputational rules can also be effective.

To strengthen enforcement, Paraguayan authorities should consider administrative measures or additional sanctions for non-compliance. The current approach to enforcement operates through accountability at the individual level. There are, however, no institutional sanctions or administrative measures for congress or the Executive for possible violation of the FRL. In general, while personal sanctions can affect individual behavior, following a more institutional approach would be welcome and would likely be more effective with respect to strengthening the underlying budgetary process. [8]

Paraguayan authorities plan to introduce an independent fiscal council, which could be an important step towards strengthening institutions. The envisaged fiscal council's main objective would be to assess fiscal policy, but it could also evaluate the fiscal forecasts undertaken by the Ministry of Finance. The council would comprise reputable fiscal experts that would serve on a honorary basis and are expected to be independent and have a non-partisan nature. But the empirical evidence suggests that the mere establishment of a fiscal council does not by itself lead to stronger fiscal performance (Debrun and Kinda, 2014). Only fiscal councils that possess certain characteristics such as, independence (either legal or operational), adequate staffing, or high media impact, are associated with better fiscal outcomes. In this context, it would be desirable that the council produces a periodical report that would be made available to the public, as is the norm for most fiscal councils in the IMF fiscal council dataset.

C. Correction Mechanisms

Paraguay's fiscal framework would also benefit from introducing correction mechanisms to address deviations from the fiscal rules, as well as the path back to compliance. For example, if there is a breach of either the deficit or the expenditure rule in terms of budget outturns, the authorities could commit to lowering spending over the next three years to compensate for the observed deviation.

[8] Sequesters, or automatic spending cuts, were used in the United States to ensure that U.S. Congress did not violate the budget envelope. The United States Congress had a set of caps on annually-appropriated spending (an overall budget envelope) and a "pay-as-you-go" process for change to entitlements or taxes. In this way, any increase in expenditure has to be offset by expenditure cuts elsewhere, or increases in taxes. If congress approves a budget that breaches the envelope for the year, the Omnibus Budget Reconciliation Act of 1990 authorizes the President to invoke sequestration.

"Debt brakes" used in the Swiss and German structural budget balance rules are an example of an automatic correction mechanism. With a debt brake, deviations from the structural budget balance rule, both positive and negative, are stored in a notional account and accumulate over time. When the accumulated deviation exceeds a threshold, improvements in the structural balance are required to reverse the deviation, typically over the next three years.

Correction mechanisms are also frequently present in countries that follow debt rules. Poland's and Slovakia's debt rules include thresholds that trigger actions such as discussion of measures between cabinet and parliament or automatic spending cuts to avoid reaching the debt ceiling (Schaechter, Kinda, Budina, and Weber, 2012).

D. Escape Clauses

With clearly defined, but narrow, escape clauses, Paraguay's fiscal framework might benefit from more ex-ante flexibility. Paraguay's escape clauses are only triggered under a limited range of relative large shocks, including negative economic growth rates. The FRL also limits fiscal deterioration allowed under the escape clauses (similar to the cases of the escape clauses prevailing in Peru and Panama). While the previously mentioned features are aligned with best practices[9], there may be scope to allow for greater countercyclicality by adding provisions for substantial growth slow-downs (in addition to outright negative growth rates) and by incorporating forward-looking elements to escape clause triggers. In that context, it could be useful to consider using quarterly GDP forecasts and invoke the escape clause in periods where a significant growth slow-down is projected over two quarters.

Escape clauses could be complemented by a medium-term plan to correct deviations from the rule once they occur. Germany, Peru, and Romania are examples of countries that have a well-defined transition path to address deviations once escape clauses are invoked (Kinda and others, 2013).

IV. Revisiting Paraguay's FRL and Reform Options

This section presents the trade-offs associated with key reform efforts for the FRL. We concentrate the discussion on the overall deficit ceiling of the central government because it has been the focal point around which expectations are anchored. Three types of reforms are considered: (i) retaining the deficit ceiling; (ii) making the deficit ceiling more flexible through a golden rule, a higher ceiling, or a structural balance rule; and (iii) removing the deficit ceiling and focusing on the existing expenditure rule.

A. Retaining the Current Deficit Rule

With the primary aim of building a solid track record of compliance, there is a strong justification not to make any major modifications to the FRL at this stage. Rating agencies,

[9] In the Mexican case, Valencia (2015) argues that escape clauses that were triggered too frequently undermined credibility of the framework and had adverse consequences for sustainability.

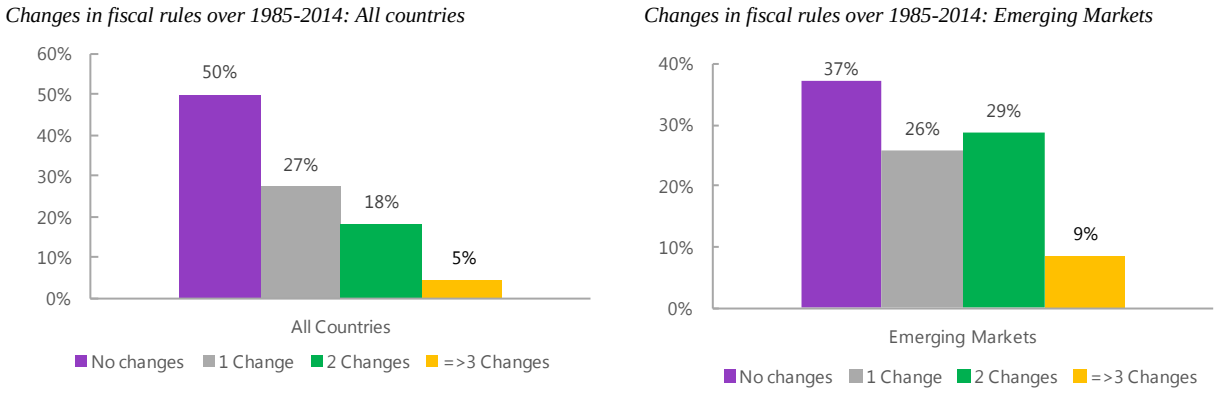
international financial institutions and investors are monitoring Paraguay's early compliance with the FRL, and changes could be perceived negatively so soon after its initial implementation, potentially affecting Paraguay's ratings and sovereign spreads (especially if not properly explained). In terms of design, the current expenditure ceiling is close to estimates of potential GDP growth for the country, though adjustments may be needed if potential GDP decreases. The prevailing constraints on the growth of the wage bill seem appropriate given that compensation of employees continues to represent a relatively large share of total expenditures, but may be a limitation in case of adopting an ambitious civil service reform in the future.

Moreover, while substantial modifications of fiscal rules are not uncommon in developing economies, they could entail transitional costs. Figure 3 indicates that significant changes to fiscal rules are relatively more frequent among emerging market countries. Modifications might be a reflection of poor design and/or lack of flexibility of the original rules. On the other hand, a period of calibration of the parameters of the law should also be expected as there are always unforeseen situations. Changes that were perceived by markets as a potential dilution of the law, however, could be damaging to credibility. The fact that policymakers are not starting from a clean slate is likely to have important implications in terms of credibility and could entail important transitional costs that would need to be carefully managed. In that context, it might be desirable to follow an incremental approach rather than opting for major overhauls.

B. Making the Deficit Rule More Flexible: "Golden Rule"

Authorities could consider excluding public investment expenditure from the calculation of the deficit ceiling and add a debt ceiling to mitigate risks to sustainability. Golden rules can protect investments, typically in infrastructure, that are necessary to improve a country's long-term growth prospects (see IMF, 2014 for a discussion of the macroeconomic effects of public investment). With a golden rule, however, the modified deficit ceiling does not ensure debt sustainability. Hence, in this case, an additional anchor to the fiscal framework in the form of a debt ceiling would be needed to preserve sound public finances.

Figure 3. Frequency of Changes in Fiscal Rules (in % of total number of countries with rules)



Source: Authors' calculations based on IMF Fiscal Rules Dataset, 2015.

However, it is important to acknowledge that there is no theoretical or empirical consensus on how to decide on a specific level for the debt ceiling. It should depend in part on the authorities' preferences regarding buffers to accommodate shocks, including contingent liabilities as well as the country's ability to tap capital markets. According to the IMF's fiscal rules dataset, emerging markets that follow debt rules have typically set ceilings between 40 to 60 percent of GDP, although coverage (general government versus broad public sector) tends to vary. It would also be desirable to retain the current expenditure rule, which would contribute to achieve sustainability and would moderate some of the reputational costs of amending the FRL.

If a golden rule is chosen, it should be accompanied by a number of safeguards. To ensure that additional capital expenditures effectively contribute to increase potential growth, authorities should intensify efforts to enhance public investment management, including in the crucial dimensions of project appraisal, implementation (procurement, internal controls and audits) and evaluation. Given the precedent established by the 2015 Budget law, it might be useful to focus on excluding only externally financed public investment from the calculation of the deficit. Financing by external funds is less likely to lead to crowding-out effects. To mitigate issues related to the classification of capital expenditures, authorities should commit to strictly follow international standards for government finance statistics in the budget process as well as when monitoring implementation of the fiscal rule.

C. Making the Deficit Rule More Flexible: Raising the Deficit Ceiling

Alternatively, authorities could consider increasing the headline ceiling. A higher ceiling could provide room to accommodate cyclical shocks, while also allowing for increases in public investment. Authorities could also envisage the introduction of an investment floor to ensure favorable composition of spending.

While still compatible with debt sustainability, an increase in the deficit ceiling will have important implications for private sector perceptions. Assuming an 8 percent nominal growth rate, a 3 percent of GDP headline deficit would imply a steady-state debt to GDP ratio of around 40 percent (see Annex I). Nevertheless, this option would have important implications for the transition to the new framework, since the authorities have not yet built a track record in terms of successful implementation of the FRL in its current form. In that context, this option could be perceived by the private sector as a dilution of fiscal discipline.

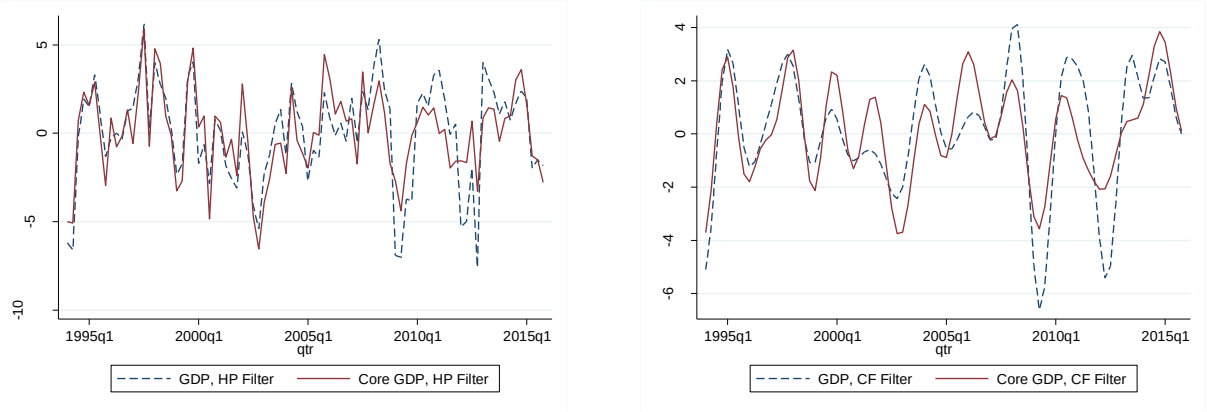
D. Making the Deficit Rule More Flexible: Moving to a Structural Balance Rule

A move towards a structural or cyclically-adjusted balance rule could yield more favorable results in terms of economic stabilization. The current deficit ceiling rule expressed in headline terms could lead to procyclical policies by not providing flexibility to respond to economic shocks. In contrast, a structural balance rule would allow for the full operation of automatic stabilizers. According to the IMF's fiscal rules dataset, 24 economies were following some type of structural balance rule as of 2014.

But a structural deficit ceiling would present its own operational challenges. The correction for the economic cycle and other factors can be complex. [10] In Latin America, Chile, Colombia, and Peru set budget targets in cyclically-adjusted terms, perhaps reflecting the fact that a certain number of institutional requirements need to be present for successful implementation of such rules (Ardanaz et al., 2015). The calculation of potential GDP and consequently of a structural balance for Paraguay is particularly difficult due to the volatility of growth over the past decades (the standard deviation of growth was 4.4 percent over the period 1992-2014). This reflects in part the importance of the agricultural and hydroelectricity generation sectors (binationals) in GDP.

In this context, analysts often advocate the use of a measure of GDP that excludes agriculture and binationals ("core" GDP). In fact, estimates of the output gap for total and "core" GDP can differ significantly, as illustrated in the Figure using the HP and the Christiano-Fitzgerald band-pass filters (Figure 4). The IMF country team's own measure of a "structural balance" used during Article IV consultations is based on total government revenues excluding royalties from electricity exports and grants, adjusted for the output gap of non-agriculture non-energy GDP (with an elasticity of one) and expressed as a share of potential non-agro non-energy GDP (more generally, Annex II presents some simple estimates of the elasticity of different revenues and expenditure categories to the output gap)**.**

Figure 4. Measures of Output Gap for Core and Total GDP



Source: Authors' calculations based on authorities' data.

Given these difficulties, the authorities could consider following a gradual approach if a move to a structural balance rule is decided upon. A first step would involve the wide dissemination of the methodology chosen to calculate the structural balance (including structural revenues and expenditures) as well as estimates of the structural balance over a period of time, including an analysis of the implied fiscal stance. Once market participants and the public are familiar with the relevant methodology, the structural balance could be

[10] For example, Tereanu, Tuladhar and Simone (2014) find that revisions in output gap estimates over the budget horizon in European countries have been large – almost 1½ percent of potential GDP on average – and contributed significantly to revisions in the estimated cyclically adjusted primary balances creating difficulties for the implementation of structural fiscal targets. Eyraud and Wu (2015) also discuss the difficulties to measure and implement structural fiscal stance indicators in the context of the European Union.

formally incorporated in the fiscal framework. The authorities should note that the current ceiling in headline terms is well understood by the public and rating agencies and, from a communication standpoint, a move to a structural balance anchor might create difficulties that need to be well-managed.

E. Removing the Deficit Rule

Finally, another reform option the authorities may wish to consider is to remove the deficit ceiling. This reform would effectively change the FRL to an expenditure rule. The international experience indicates that expenditure rules have a better compliance record, in part due to the fact that they are relatively easy to monitor and are directly enforceable through the budget process (Cordes and others, 2015). In addition, the expenditure rule in its present form directly tackles risks of excessive growth in current expenditures, which has been an area of concern for policy makers in Paraguay. Similarly, to the "golden rule" option, however, an expenditure rule by itself is not sufficient to ensure debt sustainability. Thus, the introduction of a debt anchor would be instrumental to preserving fiscal sustainability in this case.

Nevertheless, there are significant disadvantages of removing the existing deficit rule. In addition to the risks stemming from any change of rule, especially those perceived to be a dilution; if the deficit rule were removed, debt sustainability would hinge on adding a debt ceiling to the law. However, the debt ceiling would provide little guidance for fiscal policy as long as public debt is far from the ceiling. If the debt ceiling is reached, it may still provide limited fiscal policy guidance in the absence of a debt brake or other automatic corrective mechanism.

V. SIMULATIONS

In this section we present debt simulations of four different fiscal rules under a baseline and various shock scenarios. The primary goal of the simulation exercise is to evaluate debt sustainability under each fiscal rule. Second, we compare the level of public investment, under each rule. The simulation period is 2016-2026. The fiscal rules are illustrative and were chosen with a view to minimize deviations from the current FRL while allowing more room for capital spending. More room for capital spending is created either via higher overall deficit, or via the exclusion of capital expenditures from the deficit calculation.

We consider the following rules:

- **Rule 1**: Golden rule with 1.5 percent deficit excluding capital expenditures.
- **Rule 2**: Golden rule with 1.5 percent deficit excluding capital expenditures, combined with the existing expenditure rule.
- **Rule 3:** Overall deficit of 3 percent combined with the existing expenditure rule.

a) **Rule 3a**: Rule 3, assuming that capital expenditures are fixed and current primary expenditures are a residual up to the deficit or expenditure ceiling, whichever is more restrictive.

b) **Rule 3b**: Rule 3, assuming that current primary expenditures grow at 4 percent in real terms, and capital expenditures are a residual category up to the deficit ceiling.

- **Rule 4:** Overall deficit of 1.5 percent combined with the existing expenditure rule.

We consider three deterministic shock scenarios: (i) a boom-bust shock; (ii) a temporary negative shock and a permanent negative shock; (iii) in addition to our reference scenario. In the reference scenario we assume growth rates to be the same as those in the IMF's WEO Live database as of August 19 2016, with growth equal to potential growth of 3.8 percent after 2021. In the boom-bust scenario a positive output gap opens in 2016, peaks in 2018 and is followed by a bust in 2019 with a slow recovery until 2024. The peak shock in both the boom-bust scenario and the temporary negative shock scenario is large, at about 7.5 percentage points of real GDP growth.[11] In the negative shock scenario, a negative output gap opens in 2016, peaks in 2018 and is closed by 2023, when growth returns to potential of 3.8 percent. In the permanent negative shock scenario, we assume potential growth falls to 2.5 percent and growth adjusts to this new potential level starting in 2016.

We assume that an increase in capital expenditures can increase growth. To quantify this effect, we use benchmark estimates for emerging market economies from IMF (2014). These estimates suggest that the contemporaneous effect of a 1 percentage point of GDP increase in public investment is a 0.25 percent increase in output, which gradually increases to 0.5 percent four years after the shock. In our simulations, if we assume that capital expenditures are fixed at, say 4.5 percent, then the positive shock to capital expenditures in 2016 is about 0.5 percentage points of GDP, given that in 2015 capital expenditures were already high at about 4 percent of GDP.

While the composition of the budget is not directly determined by the fiscal rule, it may be influenced by it. In the case of the two golden rules, we assume capital expenditures to be fixed at 4.5 percent of GDP. Capital expenditures at 4.5 percent of GDP would allow Paraguay to recover from years of underinvestment in infrastructure. With capital expenditures fixed, current primary expenditures are then calculated as a residual up to the maximum allowed deficit (Rule 1), or maximum current primary expenditure growth (Rule 2). Interest payments depend on the size of the debt and the interest rate, which is determined exogenously based on Libor and a premium for Paraguay. Government revenues projections are the same as in the IMF's WEO Live database as of August 19 2016 and assumed constant as a share of GDP after 2021.[12] For Rule 3, we consider two options, 3a and 3b. In option 3a,

[11] This shock is chosen to be at the end of the 90 percent confidence interval of growth in Paraguay observed over 1994-2014, i.e. we calculate the standard deviation of growth rates between 1994 and 2014 and multiply it by a factor of 1.63 to get the shock.

[12] For more details and precise formulas, see Annex I.

(continued…)

capital expenditures are also fixed at 4.5 percent of GDP, and if necessary, current expenditures must adjust to satisfy the overall deficit of 3 percent.

Typically, governments treat capital expenditures as a residual category. This helps to motivate the assumption we make in rules 3b[13] and 4. This approach makes sense if we think that other expenditures are hard to control as they are determined by political pressures (current primary) and external environment (interest rate). In Rules 3b and 4, we assume that current primary expenditures grow at the rate of 4 percent per year, the maximum growth rate permitted by the expenditure rule and interest payments are determined by existing stock of debt and the interest rate.

B. Simulation Results: Debt Sustainability

Simulation results indicate that debt sustainability is preserved under the overall deficit rules, but may be compromised under the two golden rules. As seen in Figure 5, Rules 3 and 4 – the overall deficit rules – seem to converge to a steady state. In fact, for Rule 4, the debt profile is almost flat in the reference scenario, staying around 20 percent of GDP, which is the current level of central government debt. Even, under big shocks to growth, the debt path is sustainable, and the debt level remains relatively low. Under Rule 3 – the 3 percent overall deficit rule – debt is increasing, but at a slower rate over time. As shown in Table 1 in the Annex, the steady state level of debt consistent with an overall deficit rule of 3 percent and a nominal growth rate of around 8 percent is around 40 percent of GDP—twice the level with 1.5 percent deficit ceiling.

The two golden rules, however, may be unsustainable, depending on the level of current expenditures that the government chooses. In both cases, we assume that current primary expenditures grow as much as it is allowed under the rule. Under Rule 1, which has no expenditure rule, current primary expenditures could go up to almost 18 percent of GDP under the Reference scenario, and still comply with the modified deficit rule of 1.5 percent excluding capital expenditure.[14] Under Rule 2, which has an expenditure rule, current primary expenditures would grow at a rate higher than the economy (4% vs. 3.8% real growth), and Paraguay would have to borrow both for capital and current expenditures.

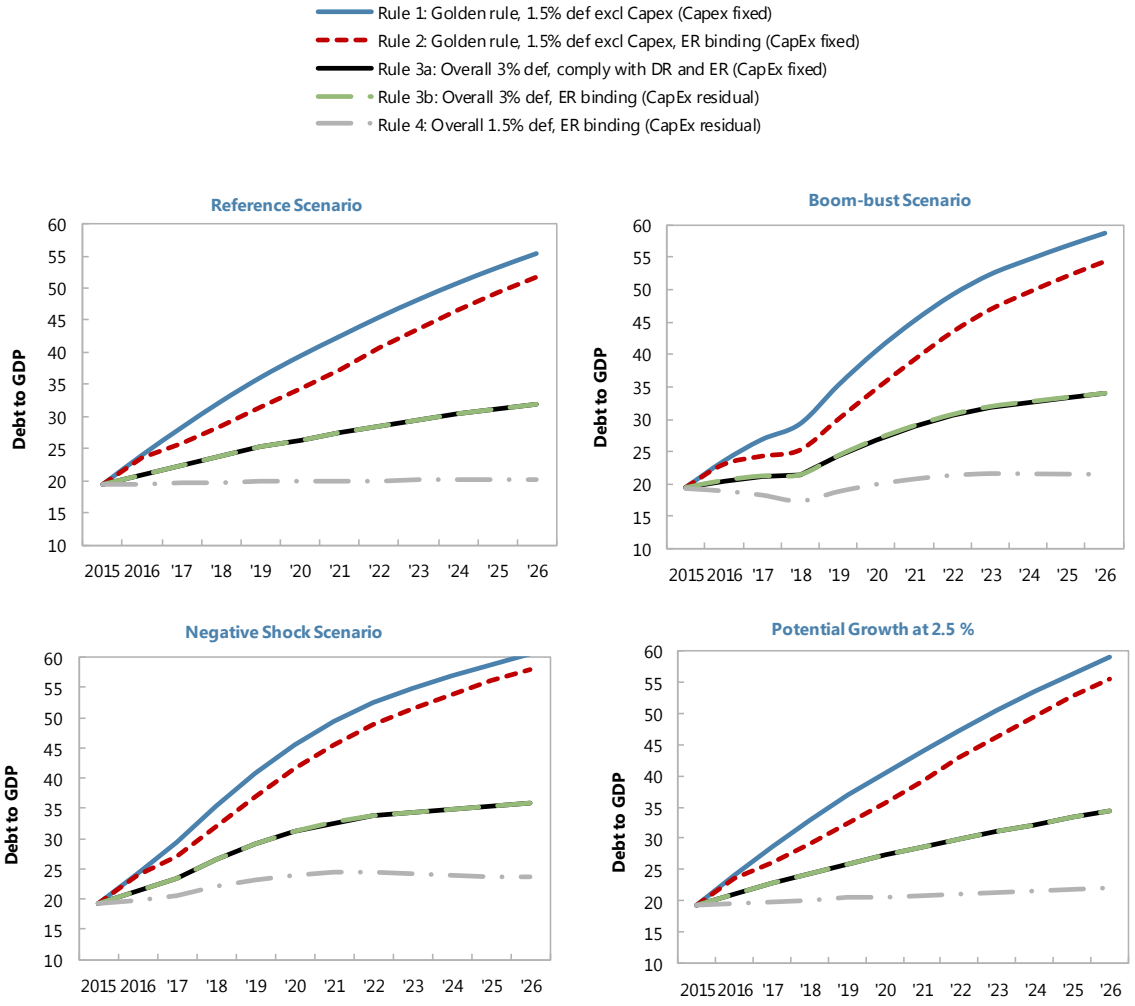
The general ranking of different rules with respect to debt trajectories stays the same under different growth shocks – debt levels decrease as we move from rule 1 to 4. As seen in the other panels of Figure 5, debt to GDP levels would be higher if the economy is hit by various temporary or permanent shocks. Still, debt profiles associated with Rules 3 and 4 would be sustainable, while the debt profile of the golden rules may be unsustainable. One should note also that the debt profiles under different growth shocks could be much worse than the

[13] Note that the differentiation between Rule 3a and 3b is only to do with the composition of expenditures. The fiscal rule for both 3a and 3b is exactly the same – overall deficit no higher than 3 percent of GDP and current primary expenditure growth no more than 4 percent in real terms.

[14] Of course, this high level of current primary expenditures would be debt financed and, in order to satisfy the 1.5 percent modified deficit rule, as interest payments increase over time, current primary expenditures would have to fall to less than 15 percent of GDP in 2026.

simulations suggest in case the government decides to suspend the rule in response to the growth shock. Our simulations assume the government always complies with the fiscal rule, no matter the size of the growth shock.

Figure 5. Paraguay Debt Paths under different fiscal rules and growth scenarios



C. Simulation Results: Composition of Expenditures

The composition of expenditures can vary significantly under different rules as shown in Figure 6. Rules 1 and 2 would protect capital expenditures by design, but current primary expenditures may have to go down as a share of GDP when either the modified deficit rule or the expenditure rule become binding. On the other hand, if capital expenditures are not explicitly protected and are a residual in the budget, they might suffer at the expense of current primary expenditures.[15]

[15] For explicit formulas on the composition of expenditures, please refer to Annex I.

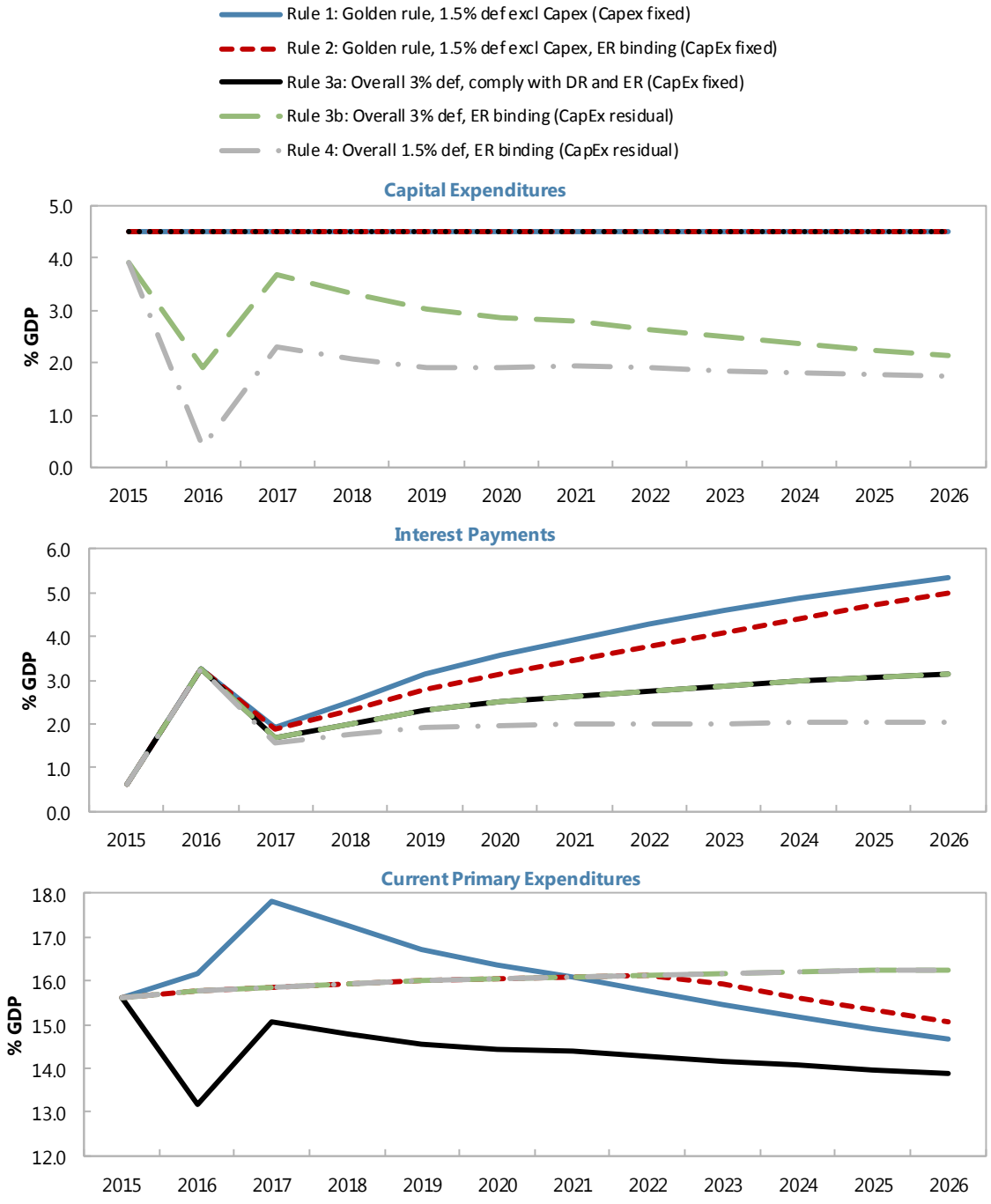
Rules 3a and 3b have the same interest payment profiles (given the same stock of debt), but very different capital and current primary expenditures levels. Rule 3a has fixed capital expenditures as a share of GDP, and current primary expenditures that, at times, decline as a share of GDP. This is because current primary expenditures are determined as a residual up to either the overall deficit rule of 3 percent of GDP or the expenditure rule of 4 percent growth, whichever is more restrictive. Rule 3b, in contrast, has currently primary expenditures that are slowly increasing as a share of GDP, given they grow at 4 percent and the potential growth of the economy is 3.8 percent in real terms. But, in Rule 3b, capital expenditures suffer.

Capital expenditures would be less than what the authorities would like to implement, based on the National Development Plan, if real current primary spending grows at 4 percent and the authorities comply with an overall deficit ceiling. As shown in Figure 5, when primary current expenditures grow steadily at 4 percent in real terms, then capital expenditures decline from about 4 percent of GDP in 2015 to about 2.5 percent of GDP in 2026 with a 3 percent deficit ceiling (rule 3b). Levels of public investment would be even lower with a tighter 1.5 percent deficit ceiling (rule 4). Of course, the authorities could maintain higher levels of capital expenditures, but would have to reduce current primary spending in order to satisfy the overall balance of 1.5 or 3 percent, respectively.

To allow higher capital expenditures, the government would have to either contract current primary expenditures, or accept a higher level of debt, or increase revenue, or do some combination of these. Indeed, if potential growth is less than 4 percent, the current expenditure rule may not be limiting enough, as it would allow current primary expenditures (already comparatively high in Latin America) to rise as a share of the economy. Our simulations have already incorporated some revenue reforms, and assume that the government would be able to increase revenues from about 18 percent in 2016 to 18.5 percent of GDP in 2026. It is possible that more could be achieved on that front.

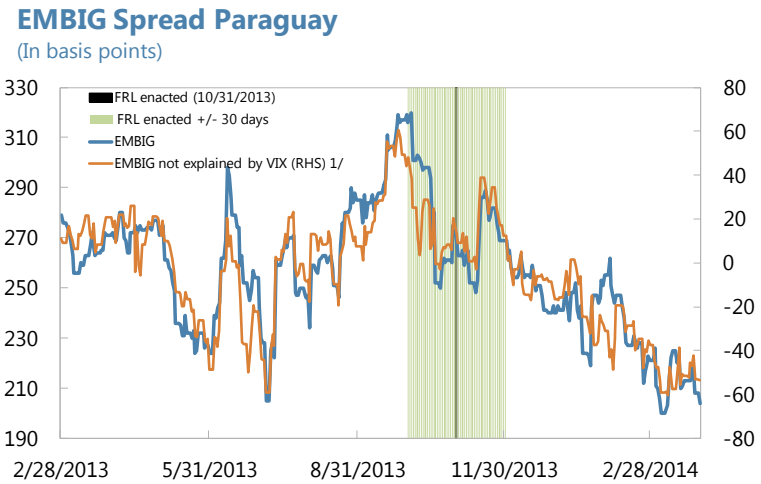
It is interesting to contrast the different debt paths under the golden rule versus the expenditure rule with a higher deficit ceiling. Both rules have capital expenditures fixed at 4.5 percent of GDP, and both include an expenditure rule, but in 2026 debt is much higher under the golden rule (Rule 2). This is because the expenditure rule with fixed capital spending (Rule 3a) has an overall deficit ceiling of 3 percent, which limits current primary expenditures more than the expenditure rule itself. With the golden rule, the only thing that limits current primary expenditures is the expenditure rule. This example emphasizes the importance of having (and complying) with an overall deficit ceiling.

Figure 5. Expenditure Items under different Fiscal Rules (Reference Scenario)



VI. Implementation Issues

An eventual transition to a revised fiscal framework would need to be carefully managed. The potential benefits of modifying the FRL would have to be weighed against the possible negative effects. There are risks to amending the framework given the fact that the authorities' track record of implementation is short and mixed. In this context, a crucial concern is the effect of modifications in the fiscal rule on sovereign spreads and rating.



Source: Bloomberg.
1/ EMBIG not explained by VIX refers to residuals of a regression of the EMBIG

Given the possibly large costs as well as high political sensitivity, any modification to the FRL needs to be carefully tested and communicated. If a transition to another rule is considered, care should be taken that all relevant stakeholders agree on and "own" the reform. The authorities should also consider testing some of the new provisions as government policies before including them in the legal framework. This will give more time for the government to understand the impact of the measures and change systems and procedures. This strategy was followed by Chile, whose authorities implemented the structural balance rule only after testing the mechanism for five years.

Once FRL amendments are agreed upon, the elaboration of a simple, clear and effective communication strategy will be crucial in the transition to a new framework. The communication should be aimed at educating the public about two key aspects: first, the objectives of the FRL reform; and second, the benefits that they should expect from it. It is useful to establish a direct link to benefits of the modifications, such as greater scope for infrastructure spending and the growth and quality of life improvements that this would bring to Paraguay over the medium term. Communication should start early in the reform process and target multiple audiences (politicians, private sector, credit rating agencies/investors, etc).

Modifications to the FRL should be announced alongside other concrete commitments to strengthen fiscal institutions and preserve the sustainability of public finances. Given that Paraguay already has an existing FRL, some parameters are already entrenched in the public's mind. It will be important to avoid perceptions of increased fiscal laxity and/or dilution of the FRL. Institutional improvements in the budgetary process that ensure ex-ante compliance with the FRL, and sanction those responsible for deviations would be necessary. Moreover, it is important to reiterate the authorities' commitment to fiscal sustainability through a credible medium-term fiscal plan that would also address structural issues such as revenue mobilization and spending rigidities. In that regard, the introduction of transparency

mechanisms such as periodic hearings in congress (quarterly for example) to discuss the implementation of the law and measures to correct deviations in case the situation deteriorates would create a systematic and periodic debate about the importance of the FRL to the fiscal discipline.

To strengthen enforcement, authorities could consider introducing correction mechanisms and/or additional sanctions for non-compliance. For example, if a debt anchor is introduced, authorities would consider introducing a debt brake mechanism, as in the German and Swiss models. This would involve specifying a particular debt path for the government that is socially appropriate for Paraguay, and adjusting spending if there are significant deviations from that path.

VII. CONCLUSION AND POLICY RECOMMENDATIONS

The authorities should establish a strong track record of compliance with the fiscal responsibility law. The FRL is still new in Paraguay and some learning by doing is expected. There are already signs that FRL implementation has brought an improvement in budget forecasting, signaling potential future effectiveness. Moreover, there are signs of improved budgetary procedures and compliance in the approved budget in 2016. There is still scope to cement the current rules as the fiscal anchor. Establishing a longer track record of compliance could be preferable to gain fiscal credibility rather than changing the rule at the outset.

Caution is warranted when considering changes to the fiscal anchor and a deliberate approach is needed in considering reforms to the law. There are important credibility and reputational costs to amending the framework, given the short track record of compliance. Issues surrounding the legal ambiguity with the current FRL also serve as a reminder that changes to the law would need to be done carefully and deliberately given the constitutional and legal framework. In terms of transition, any changes to the fiscal anchor would need to be managed and communicated carefully and should be accompanied by concrete measures to strengthen fiscal institutions and preserve the sustainability of public finances.

If amendments to the law are sought, authorities would be better served by following a balanced approach. Potential modifications to make the fiscal rules more flexible should be accompanied by a number of safeguards that enhance credibility of the fiscal anchor. For example, if the authorities decide to adopt a targeted exemption or a “golden rule” (by excluding public investment expenditure from the deficit ceiling), strictly adhering to the current expenditure rule and adding a debt ceiling would be crucial for preserving fiscal sustainability. Furthermore, as practical experience has shown, a golden rule should be accompanied by efforts to enhance public investment management efficiency and public accounting to ensure the correct classification of capital expenditures. If the authorities consider raising the headline deficit ceiling, efforts to strengthen the budgetary process and FRL provisions on sanctions and enforcement would help contain potential damage to fiscal policy credibility. While still likely compatible with debt sustainability, a moderate increase in the deficit ceiling is likely to carry reputational costs for the government.

The effectiveness of the FRL will ultimately hinge upon measures to strengthen legal and institutional aspects of the fiscal framework. In general terms, public expenditure management systems need to be sufficiently developed to monitor and enforce FRLs (Corbacho & Schwartz, 2007, van Eden, Khemani and Emery, 2013). In that context, Paraguay's public financial management system should be strengthened, particularly in terms of budgetary processes, public investment management framework, credible financial reporting and accounts, and additional fiscal transparency. From a legal perspective, the effectiveness of the FRL is limited, as per Constitutional law, congress appears not to be restrained from actions that modify the FRL. On the operational side, Paraguay's fiscal framework would benefit from the introduction of explicit correction mechanisms to address deviations from the fiscal rules, as well as the path back to compliance. More precise provisions on sanctions and enforcement would be welcome. Overall, FRLs can contribute to enhance fiscal management, but cannot substitute for strong budget frameworks and a commitment to prudent fiscal policy.

References

Ardanaz, M., Corbacho, A., Gonzales, A., Caballero, N.T. (2015) "Structural Fiscal Balances in Latin America and the Caribbean" IDB Working Paper IDB-WP-579 (Washington: Inter-American Development Bank).

Bova, E., Ruiz-Arranz, M., Toscani, F., and Ture, H. E. (2016) "The Fiscal Costs of Contingent Liabilities: A New Dataset" IMF Working Paper 16/14. (Washington: International Monetary Fund).

Caceres, C. and Ruiz-Arranz, M. (2010) "What Fiscal Rule Would Work Best for the UK?" United Kingdom Selected Issues Paper, IMF Country Report No. 10/337 (Washington: International Monetary Fund).

Corbacho, A., and G. Schwartz (2007) "Fiscal Responsibility Laws," in Promoting Fiscal Discipline, ed. by T. Ter-Minassian and M. Kumar (Washington: International Monetary Fund), pp. 58–77.

Cordes, T. and Kinda, T.,Muthoora, P. and Weber, A. (2015) "Expenditure Rules: Effective Tools for Sound Fiscal Policy?" IMF Working Paper 15/29. (Washington: International Monetary Fund).

Debrun, X., Epstein, N., Symansky, S. (2008) "A New Fiscal Rule: Should Israel "Go Swiss?" IMF Working Paper WP/08/87 (Washington DC: International Monetary Fund)

Debrun, X. and Kinda, T. (2014) "Strengthening Post-Crisis Fiscal Credibility—Fiscal Councils on the Rise. A New Dataset" IMF Working Paper WP/14/58. (Washington: International Monetary Fund).

van Eden, H. Khemani, P. and Emery, R. (2013) "Developing Legal Frameworks to Promote Fiscal Responsibility: Design Matters" in Public Financial Management and Its Emerging Architecture, ed. by Marco Cangiano, Teresa Curristine, and Michel Lazare (Washington: International Monetary Fund), pp. 79–105.

Escolano, J. (2010) "A Practical Guide to Public Debt Dynamics, Fiscal Sustainability, and Cyclical Adjustment of Budgetary Aggregates," Technical Notes and Manuals 10/02 (Washington, DC: International Monetary Fund)

Eyraud, L. and Wu, T. (2015) "Playing by the Rules: Reforming Fiscal Governance in Europe" IMF Working Paper WP/15/67. (Washington: International Monetary Fund).

Ilzetzki, E. and Vegh, C. A. (2008) "Procyclical Fiscal Policy in Developing Countries: Truth or Fiction" NBER Working Paper 14191, July, Cambridge: MA.

International Monetary Fund (2009) "Fiscal Rules—Anchoring Expectations for Sustainable Public Finances," Prepared by the Fiscal Affairs Department (Washington: International Monetary Fund).

International Monetary Fund (2014) "Is it Time for an Infrastructure Push? The Macroeconomic Effects of Public Investment" Chapter 3 of the October World Economic Outlook (Washington: International Monetary Fund).

International Monetary Fund (2015) "Can Fiscal Policy Stabilize Output?" IMF Fiscal Monitor, Chapter 2, April, Washington, DC.

Kinda, T., C. Kolerus, P. Muthoora, and A. Weber (2013) "Fiscal Rules at a Glance," Update of the IMF
Working Paper 12/273 (Washington: International Monetary Fund).

Lienert, I. and Fainboim, I. (2010) "Reforming Budget System Laws" FAD Technical Notes and Manuals (Washington: International Monetary Fund).

Schaechter, A., T. Kinda, N. Budina, and A. Weber (2012) "Fiscal Rules in Response to the Crisis—Toward the 'Next-Generation' Rules: A New Dataset," IMF Working Paper 12/187 (Washington: International Monetary Fund).

Tereanu, E. Tuladhar, A. and Simone, A. (2014) "Structural Balance Targeting and Output Gap Uncertainty" IMF Working Paper 14/107 Washington: International Monetary Fund).

Valencia, F. (2015) "Strengthening Mexico's Fiscal Framework" Mexico Selected Issues Paper, IMF Country Report No. 15/314 (Washington: International Monetary Fund).

ANNEX I: EQUATIONS UNDERLYING THE SIMULATED DEBT TRAJECTORIES

The main recursive equation for the debt ratio is the following:

(1) $d_t = \frac{1}{1+\gamma_t} d_{t-1} - b_t$

where
d_t is the ratio of debt to GDP
γ_t is the nominal growth rate of GDP
b_t is the overall balance, as a share of GDP.

Since we need to follow the components of overall balance, we will decompose (1), into equations (2)-(5), where
R_t is the ratio of revenue to GDP
CPE_t is the ratio of current primary expenditures to GDP
$CapEx_t$ is the ratio of capital expenditures to GDP
IP_t is the ratio of interest expenditures to GDP
P_tY_t is the nominal GDP
g_t is the real GDP growth rate
π_t is the inflation rate
pb_t is the primary balance as a share of GDP
i_t is the nominal interest rate

(2) $d_t = \frac{1}{1+\gamma_t} d_{t-1} - \frac{R_t - CPE_t - CapEx_t - IP_t}{P_tY_t}$

(3) $d_t = \frac{1}{1+\gamma_t} d_{t-1} - \frac{R_t - CPE_t - CapEx_t}{P_tY_t} + \frac{IP_t}{P_tY_t}$

(4) $d_t = \frac{1}{1+\gamma_t} d_{t-1} - pb_t + \frac{IP_t}{P_tY_t}$

(5) $\frac{IP_t}{P_tY_t} = \frac{i_t D_{t-1}}{P_tY_t} = \frac{i_t D_{t-1}}{(1+g_t)(1+\pi_t)P_{t-1}Y_{t-1}} = \frac{i_t}{(1+g_t)(1+\pi_t)} \frac{D_{t-1}}{P_{t-1}Y_{t-1}} = \frac{i_t}{1+\gamma_t} d_{t-1}$

since $P_tY_t = (1+g_t)(1+\pi_t)P_{t-1}Y_{t-1}$ and $(1+g_t)(1+\pi_t) = 1+\gamma_t$.

Note also, we can derive

$$d_t = \frac{1+i_t}{1+\gamma_t} d_{t-1} - pb_t$$

as is common in applications where countries target the primary balance (eg. Debrun and others, 2008, and Escolano, 2010).

In our simulations, we use equation (6) to calculate interest payments as a share of GDP.

(6) $\frac{IP_t}{P_t Y_t} = \frac{i_t^*}{1+\gamma_t} d_{t-1}$

Finally, the nominal interest rate i_t used in equation (6) should be the effective interest rate, i_t^* , defined in (7) that takes into account both the interest rate of foreign currency denominated debt, and domestic currency denominated debt.

(7) $i_t^* = \left((1-\alpha) i_t^h + \alpha i_t^f\right) + \alpha\varepsilon_t(1+i_t^f)$

Where
i_t^* is the nominal effective interest rate
α is the share of foreign currency denominated debt
i_t^h is the nominal interest rate for domestic currency denominated debt and
i_t^f is the nominal interest rate for foreign currency denominated debt
ε is the nominal depreciation.

Note that $i_t^h = \varepsilon + i_t^f$. To be more precise, if *r* denotes the real interest rate, and *h* and *f* denote home and foreign, and assuming that the real interest rate on domestic and foreign denominated debt is the same, i.e. $r^f = r^h$, and that $r^f = Libor + premium$,[16] then

$$i^f \approx r^f + \pi^f$$
$$i^h \approx r^h + \pi^h = r^f + \pi^h \approx i^f - \pi^f + \pi^h \approx i^f + \varepsilon$$

To calculate the steady state level of debt, *d*, we can use the following equation:

$$d = b\,\frac{1+\gamma}{\gamma}$$

where
d is the debt level,
b is the headline deficit,
γ is the nominal growth rate of the economy.

[16] The assumed premium for Paraguay is 400 basis points.

Annex Table 1 below shows different steady state levels of debt, associated with each combination of nominal growth rate and overall balance.

Annex Table 1. Steady State Debt Levels, given nominal growth and overall balance

Long-term nominal growth	Implied central government debt (in percent of GDP) for a CG deficit of					
	1 percent of GDP	1.5 percent of GDP	2 percent of GDP	2.5 percent of GDP	3 percent of GDP	3.5 percent of GDP
0.5%	201%	302%	402%	503%	603%	704%
1.0%	101%	152%	202%	253%	303%	354%
1.5%	68%	102%	135%	169%	203%	237%
2.0%	51%	77%	102%	128%	153%	179%
2.5%	41%	62%	82%	103%	123%	144%
3.0%	34%	52%	69%	86%	103%	120%
3.5%	30%	44%	59%	74%	89%	104%
4.0%	26%	39%	52%	65%	78%	91%
4.5%	23%	35%	46%	58%	70%	81%
5.0%	21%	32%	42%	53%	63%	74%
5.5%	19%	29%	38%	48%	58%	67%
6.0%	18%	27%	35%	44%	53%	62%
6.5%	16%	25%	33%	41%	49%	57%
7.0%	15%	23%	31%	38%	46%	54%
7.5%	14%	22%	29%	36%	43%	50%
8.0%	14%	20%	27%	34%	41%	47%
8.5%	13%	19%	26%	32%	38%	45%

ANNEX II: ELASTICITIES OF REVENUE AND EXPENDITURE TO GDP IN PARAGUAY

We estimate autoregressive distributed lags (ARDL) regressions of the cyclical components (based on the HP filter) of different revenue and expenditure items on the cyclical component of GDP. The regressions were estimated using seasonally-adjusted quarterly data covering the period 2003Q1 to 2015Q3.[17]

More specifically, we estimate regressions of the following form:

$$y_t = c + \sum_{l=0}^{n} \rho_l y_{t-l} + \sum_{i=0}^{p} \beta_i gap_{t-i} + \epsilon_t$$

where y represents the cyclical component of different revenue and expenditure items and "gap" is the output gap (cyclical component of GDP).

The regressions presented in Annex Table 2 indicate that tax revenue seems to be sensitive to the output gap with the expected positive sign and the estimated coefficient is statistically significant at conventional levels (specification 2). Nevertheless, the coefficient on the output gap in the regression with total revenue as the dependent variable (specification 1) is smaller and only marginally significant (10 percent level).

When discussing regression results for expenditures, we will focus on social and current primary expenditures, as is typically done in the literature on automatic stabilizers. In this context, capital expenditures are thought to be essentially discretionary. The results in Table 1 show that while the contemporaneous coefficient for the output gap in the equation for current primary expenditures is not statistically significant at conventional levels (specification 7), the second lag of output gap presents a negative (countercyclical) and significant coefficient. This finding is somewhat unusual for a country at Paraguay's level of development. In advanced economies, social expenditures (in particular unemployment benefits) are found to play a predominant role as stabilizers, but in the case of Paraguay this expenditure item does not present a statistically significant cyclical response (specification 6).

Given the well-known biases introduced by the use of statistical filters to obtain cyclical components, we also considered specifications that include variables in first differences. Using this functional form, the specifications for both total and tax revenue present statistically significant coefficients of similar size (about 0.6) for changes in GDP. As far as current expenditures are concerned, the coefficient for the first lagged difference in output is significant with a negative sign, confirming the countercyclical nature of expenditures, albeit with a smaller coefficient (-0.3 rather than -0.5). These estimation results are available upon request.

[17] The choice of the sample period used in the regressions was dictated by availability of fiscal data at a quarterly frequency in the GFSM 2001 format. Fiscal variables were deflated using the GDP deflator. All variables were transformed in logs.

Annex Table 2. ARDL Regressions (Cyclical Components)

	1	2	3	4	5	6	7
	Revenue	Total Tax	Excise	VAT	Trade	Social	Current Primary
Y_{t-1}	0.155	0.493	0.02	-0.097	0.058	0.221	-0.172
	[0.946]	[5.164]**	[0.203]	[-0.622]	[0.312]	[1.876]	[-1.975]
Y_{t-2}			0.089	-0.18	0.332		-0.169
			[1.391]	[-1.785]	[3.502]**		[-1.834]
Y_{t-3}			0.278	0.083			-0.203
			[1.302]	[0.689]			[-2.357]*
Y_{t-4}			-0.168	-0.22			0.744
			[-1.670]	[-2.450]**			[9.265]**
Gap_t	0.325	0.571	0.342	0.657	1.592	-0.748	-0.474
	[1.926]	[3.942]**	[0.922]	[1.376]	[2.736]**	[-1.865]	[-1.461]
Gap_{t-1}							-0.602
							[-1.937]
Gap_{t-2}							-0.506
							[-2.493]*
C	0.003	0.002	0.002	0.011	0.008	-0.001	-0.004
	[0.347]	[0.299]	[0.123]	[0.526]	[0.382]	[-0.074]	[-0.549]
Observations	49	49	46	46	48	49	46
R-squared	0.048	0.388	0.171	0.21	0.222	0.14	0.885
F-statistic	1.159	14.598	1.652	2.129	4.181	3.757	41.794

Note: t statistics in brackets. ARDL model specification selected based on AIC. ** denotes statristical significance at the 1% level; * denotes statistical significance at the 5% level. HAC Standard Errors and Covariance.

The results presented in Annex Table 2 are subject to several important econometric shortcomings, in particular endogeneity and omitted variable bias. We attempt to tackle the endogeneity problem by estimating two-stage-least-squares regressions that instrument for GDP by using Paraguay's trade partners' growth rates and lagged values of GDP.[18] Annex Table 3 presents the results obtained for regressions that consider variables in first differences (rather than cyclical components).

Not surprisingly, the coefficient estimates for changes in GDP obtained in the regressions for total revenue and tax revenue are quantitatively larger than the ones presented previously (OLS results are biased downwards). Nevertheless, the coefficient estimates for GDP in the specification including current primary expenditures is no longer significant (the point estimate is positive and close to zero in size). The results for regressions including cyclical components are similar with two important differences: the coefficient for the output gap in the specification for total revenue is not statistically significant and the coefficient for the output gap in the specification for social expenditures is statistically significant and is estimated at around -0.8.

[18] This approach to instrumentation follows lIzetzki and Vegh (2008).

Annex Table 3. Two Stage Least Squares Regressions

	1	2	3	4	5	6	7
	Revenue	Total Tax	Excise	VAT	Trade	Social	Current Primary
C	0.004	0.006	0.009	0.001	-0.022	0.034	0.019
	[0.555]	[1.317]	[0.343]	[0.092]	[-1.298]	[2.686]*	[2.655]*
ΔGDPt	0.901	1.012	-0.098	-0.004	2.459	-1.867	0.054
	[2.355]*	[2.649]*	[-0.037]	[-0.003]	[1.919]	[-1.935]	[0.123]
Observations:	46	46	46	46	46	46	46
R-squared:	0.142	0.154	-0.005	0	0.031	-0.032	-0.003
F-statistic:	1.923	5.997	0.001	0	1.618	3.515	0.018

Note: t statistics in brackets. ** denotes statristical significance at the 1% level; * denotes statistical significance at the 5% level. HAC Standard Errors and Covariance. GDP growth was instrumented using trade partners' growth

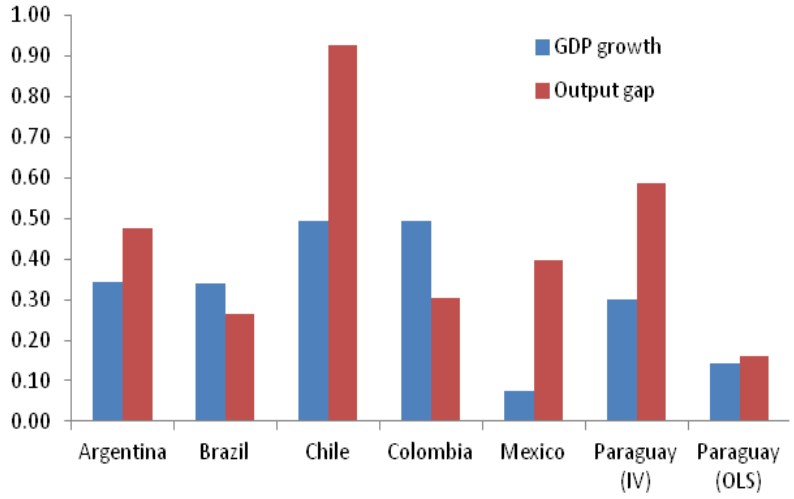
Estimating fiscal stabilization coefficients

We also estimate so-called "fiscal stabilization coefficients" for Paraguay, following the approach outlined in IMF (2015). The coefficients are obtained by a simple bivariate regression of the overall budget balance on the output gap using annual data and are intended to give a quantitative sense of the effectiveness of fiscal policy in smoothing output fluctuations, as the fiscal balance needs to increase when output rises and decrease when it falls for fiscal policy to be stabilizing

Annex Figure 1 presents the results obtained for Paraguay as well as the estimates for selected Latin American countries drawn from IMF (2015). We start by focusing on OLS estimates which are directly comparable across the countries considered. In this case, the estimates for Paraguay are notably smaller than the ones obtained for other countries and are in fact not statistically significant at conventional levels.

Annex Figure 1. Fiscal Stabilization Coefficients

$$OB_t = \alpha + \beta gap_t + \epsilon_t$$



Source: IMF (2015) and own estimations for Paraguay using IV and OLS estimators. The IV coefficients for Paraguay were based on 2SLS regressions corrected for weak instruments. The output gap was instrumented using trade partner growth.

Nevertheless, when we instrument the output gap by trade partner growth, the fiscal stabilization coefficients for Paraguay become broadly similar to those obtained for a number of other Latin American countries, with the exception of Chile which presents a larger coefficient. It is also interesting to note that the median value for the fiscal stabilization coefficient obtained for emerging and developing economies is 0.58 (IMF, 2015), which is close to the instrumental variable (IV) estimate for Paraguay.

Comparing the size of automatic stabilizers to the overall fiscal stabilization coefficients provides an indication of their relative contribution to fiscal stabilization. The median contribution of automatic stabilizers to overall fiscal stabilization in emerging markets and developing economies is estimated to be around 30 percent compared to a median contribution of 60 percent for advanced economies (IMF, 2015). In the case of Paraguay, we estimate that the contribution of automatic stabilizers to fiscal stabilization is close to 25 percent (based on the IV coefficients), somewhat lower than the median for emerging markets and developing economies.