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Peru: Selected Issues

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Selected Issues

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Performance of Alternative Fiscal Rules: An Application to Peru

This chapter assesses the performance of alternative fiscal rules in supporting medium-term fiscal policy objectives. Three main conclusions emerge from the analysis. First, there is no dominance of one rule to the others but rather each one involves trade-offs in terms of sustainability, cyclicality, volatility of main fiscal variable, and different degrees of implementation challenges. Second, the selection of a particular rule should be based on its performance relative to a prioritized set of fiscal policy objectives. In the case of Peru, the analysis suggests that a structural approach could result in important gains in terms of limiting pro-cyclical effects. However, a formal structural balance rule can be demanding in terms of economic and institutional prerequisites, entailing lengthy preparatory steps. Third, the current Fiscal Responsibility and Transparency Law (FRTL) has been critical for debt reduction in Peru, with embedded flexibility to adapt to evolving objectives. A change in FRTL parameters can replicate some of the features of a structural balance rule, while preserving debt limit objectives.

I. Background

1. The Peruvian authorities have shown a strong commitment to prudent fiscal policy. In 1999, the first version of the Fiscal Responsibility and Transparency Law (FRTL) was introduced, representing a structural change in fiscal strategy in Peru (Box). While the FRTL was instrumental for fiscal consolidation, controlling spending has been challenging and caps frequently proved to be difficult to enforce, particularly at the sub-national level. Overall, against a backdrop of strong growth and high commodity prices, fiscal policy has been slightly counter-cyclical.

2. The current global financial crisis has strained national fiscal rules over the world, with fiscal rules in many countries being modified, including in Peru.[2] Thanks to large saving accumulated in recent years, Peru was able to implement a significant fiscal stimulus that entailed a positive fiscal impulse of about 2½ percent of GDP in 2009—a 14 percent increase in real general government primary spending, far beyond the cap established in the FRTL. Also, the FRTL was modified to increase the 1 percent of GDP deficit limit to 2 percent in 2009−2010.In 2010, with increasing evidence of a self-sustained rebound, fiscal policy is moving towards a neutral fiscal stance, returning to the FRTL debt limit in 2011.

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[1] Prepared by I. Rial (FAD).

[2] For a detailed assessment of the international experience see “Fiscal Rules: Anchoring Expectations for Sustainable Public Finances” IMF Policy Paper, November.

3. While recent efforts to strengthen the fiscal framework have been significant, challenges remain to formalize a more explicit medium-term orientation of fiscal policy. Main challenges comprise the adoption and implementation of a fiscal rule that could help maintain public finances on a sustainable path, smooth output fluctuations, and create a budgetary cushion against adverse shocks and long-term fiscal pressures.

4. This chapter assesses the performance of alternative fiscal rules in supporting medium-term fiscal policy objectives. Three principal conclusions emerge from the analysis. First, none of the rules examined clearly dominates the others. Rather, each one involves trade-offs in terms of sustainability, cyclicality, volatility of main fiscal variable, and different degrees of implementation challenges. Second, the selection of the appropriate rule should be based on its performance relative to a prioritized set of fiscal policy objectives. In the case of Peru, the analysis suggests that a structural rule could have substantial gains while risks remain contained. However, a structural rule can be demanding in terms of economic and institutional prerequisites, entailing lengthy preparatory steps. Third, the current FRTL has proven to be flexible and a change in parameters can replicate the results of a structural rule, while preserving debt limit objectives.

II. Main Results

5. This section assesses the fiscal implications of alternative fiscal rules under a variety of scenarios. To illustrate how fiscal variables behave under alternative rules, we present two sets of simulations. First, we simulate how fiscal variables would have behaved if these rules had been in place during 1998−2008—i.e., a deterministic backwards looking exercise. Second, we discuss the results of the implementation of the same rules for the next five years (2009−2015) under both deterministic and stochastic scenarios.

6. Four fiscal rules are considered in the simulations: (i) a basic balance budget rule, which targets a zero nominal overall balance; (ii) a expenditure rule, which caps real primary expenditures increase to 5.5 percent a year; (iii) a structural balance rule, which targets a zero primary balance adjusted to account for medium-term output and commodity prices levels; and (iv) the Peruvian FRTL rule, which allows for an overall fiscal deficit of up to 1.0 percent of GDP in "bad" times, while capping the increase in real expenditures to 3.0 percent in "good" times. [3,4]

7. Assessing the performance of alternative rules entails trade-offs between various policy objectives and medium-term fiscal risks. Fiscal rules can serve different policy

[3] Bad times are defined as those years where real GDP growths below its potential rate. Good times are defined accordingly.

[4] For simplicity purposes, the "theoretical" Peruvian rule is a stylized version of the "real" rule.

Box. 1 Peruvian Fiscal Rule

Legal status of the rule. As part of the effort to alleviate medium-term PFM shortcomings, the *"Ley de Responsabilidad y Transparencia Fiscal"* (FRTL) was enacted in December 1999 as a permanent institutional device to promote fiscal discipline in a credible, predictable, and transparent manner. In 2003 the *Fiscal Management Responsibility Act* was introduced with a clear objective of debt consolidation.

Rationale for the fiscal rule. The FRTL included a combination of a deficit target and real current expenditure ceiling for the nonfinancial public sector and general government respectively, as well as debt ceilings for subnational governments. The main features of the Peruvian FRL can be summarized as follows:

- It contains procedural and transparency provisions; particularly, the government must prepare the Multi-Annual Macroeconomic Framework *(Marco Macroeconómico Multianual*) containing three-year macroeconomic projections of revenue, expenditure, public investment, and public debt.
- Numerical fiscal targets are embedded in the law (see table below).
- Institutional coverage is broad, covering the nonfinancial public sector (although not for all targets).
- Sanctions are only institutional.
- Escape clauses allow deviations from numerical targets during periods of low growth.
- Cyclical considerations are taken into account by establishing fiscal stabilization funds to mitigate cyclical variations.

Historical compliance with the rule. The numerical targets embedded in the law were changed over time, such as in 2003, 2007 and 2009. The following table summarizes the main changes introduced to the FRTL.

Numerical Targets of the Fiscal Responsibility and Transparency Law (FRTL)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Main Numerical Rules [1/]										
Deficit Non-Fin. Public Sector (% GDP)	2.0	1.5	1.0	2.0	1.5	1.0	1.0	1.0	1.0	2.0
Current Expenditures General Gov. (real change %)	2.0	2.0	2.0	3.0	3.0	3.0	3.0			
Consumption Central Gov. (real change %) [2/]								3.0	3.0	4.0
Execution										
Deficit Non-Fin. Public Sector (% GDP)	3.3	2.5	2.2	1.7	1.0	0.3	-2.1	-3.1	-2.1	2.1
Current Expenditures General Gov. (real change %)	1.2	-4.3	2.3	3.0	2.2	8.6	2.4	6.0	7.4	6.4
Consumption Central Gov. (real change %) [2/]								2.4	0.3	13.4

Source: Montoso, Carlos and Moreno, Eduardo, "*Reglas Fiscales y la Volatilidad del Producto*" Estudios Económicos, Banco Central de Reserva de Perú, and staff updates.

1/ Numerical rules for subnational governments are not included in this table.

2/ Following the national definition, consumption comprises expenditures on wages and salaries, goods and services, and pensions.

Response to the global financial crisis. The impact of the recent global financial crisis has been significant, which called for countercyclical monetary and fiscal policies. Escape clauses in the law were not applicable for this particular shock. However, the FRTL includes an exceptional escape clause that allows for a temporary relaxation of the targets with Congressional approval. The relaxation of the FRTL targets was approved in May 2009 to allow a deficit of 2 percent of GDP and to undertake a countercyclical fiscal policy response.

objectives, such as: promote fiscal sustainability, provide cyclical flexibility (the ability to respond to shocks), promote economic stabilization, contain the size of the government, support intergenerational equity, etc. Each type of fiscal rule has different properties relative to key policy objectives. Furthermore, priorities may change over time once gains from past policies are achieved, which may justify a change of the fiscal rule in place.

8. We use summary indicators to compare the performance of alternative rules to achieve different policy objectives. Rules are compared with regards to its ability to: (i) ensure a sustainable debt path (sustainability); (ii) ensure a neutral stance relative to the cycle (cyclicality);[5] (iii) help deliver the required adjustment without requiring a significant fiscal effort that may not be politically feasible; (iv) minimize volatility of main fiscal variables; and (v) allow for the accumulation of fiscal buffers in "good" times. To obtain a more realistic assessment of the merits of alternative fiscal rules in the medium-term we introduce a stochastic approach to discuss the appropriate level of risks that the authorities might be willing to take.

Application of Alternative Rules for 1998−2008

9. As a deterministic backward looking exercise for the period 1998−2008, we simulate the fiscal path under the four alternative rules, assuming that they were binding and met every year. Table 1 and Figure 1 present the main results.

10. Key conclusions emerge from this exercise:

- All proposed rules show similar results in terms of fiscal sustainability. Debt ratio remains around 40 percent of GDP in average for the period, similar to actual levels.
- Not surprisingly, the structural balance rule and, to a lesser extent, the actual fiscal data exhibit a more neutral stance; while the balance budget rule is procyclical and the expenditure rule countercyclical. The Peruvian theoretical rule gives similar results to the expenditure rule for this period.
- Discrepancies between the results of the Peruvian theoretical rule and actual fiscal data derive from temporary deviations of actual policy from the theoretical rule. As shown in Figure 1, in 2008 actual fiscal data shows a procyclical stance (real expenditures increased significantly over the cap in the context of a highly positive output gap), while under the theoretical rule fiscal stance would have been counter cyclical.

[5] To measure the procyclical bent in a fiscal rule we calculated the cumulative pro-cyclical impulses over the reference period (as proposed by *Debrun, et altri IMF WP/08/87*). That means improvements in the primary balance during bad times, and deteriorations of the primary balance in good times (in percent of GDP). The higher the indicator, the more procyclical the rule is.

- The structural balance rule requires the lowest fiscal effort, measured as the minimum real change in primary expenditures in one year. The Peruvian theoretical rule and the balance budget rule are the ones requiring the larger fiscal effort.
- The expenditure rule shows the lowest volatility, measured by the standard deviation of real changes of primary expenditures. Under the balance budget rule, shocks to GDP affect tax revenues and lead to a corresponding adjustment in expenditures. Under the structural rule, shocks to GDP would also affect the output gap offsetting the required adjustment in expenditure, thus resulting in a smoother expenditure pattern. The Peruvian theoretical rule shows very similar results to the structural balance rule in terms of spending fluctuations during this period.
- The Peruvian theoretical rule allows for the highest accumulation of fiscal surpluses in "good" years, followed by the structural balance rule. These two rules promote the building up of fiscal buffers that could be used in less favorable years. The balance budget rule does not allow for accumulation of fiscal surpluses by construction. Under the expenditure rule, while fiscal performance improves in good years, it is not enough to generate an overall surplus during this period.

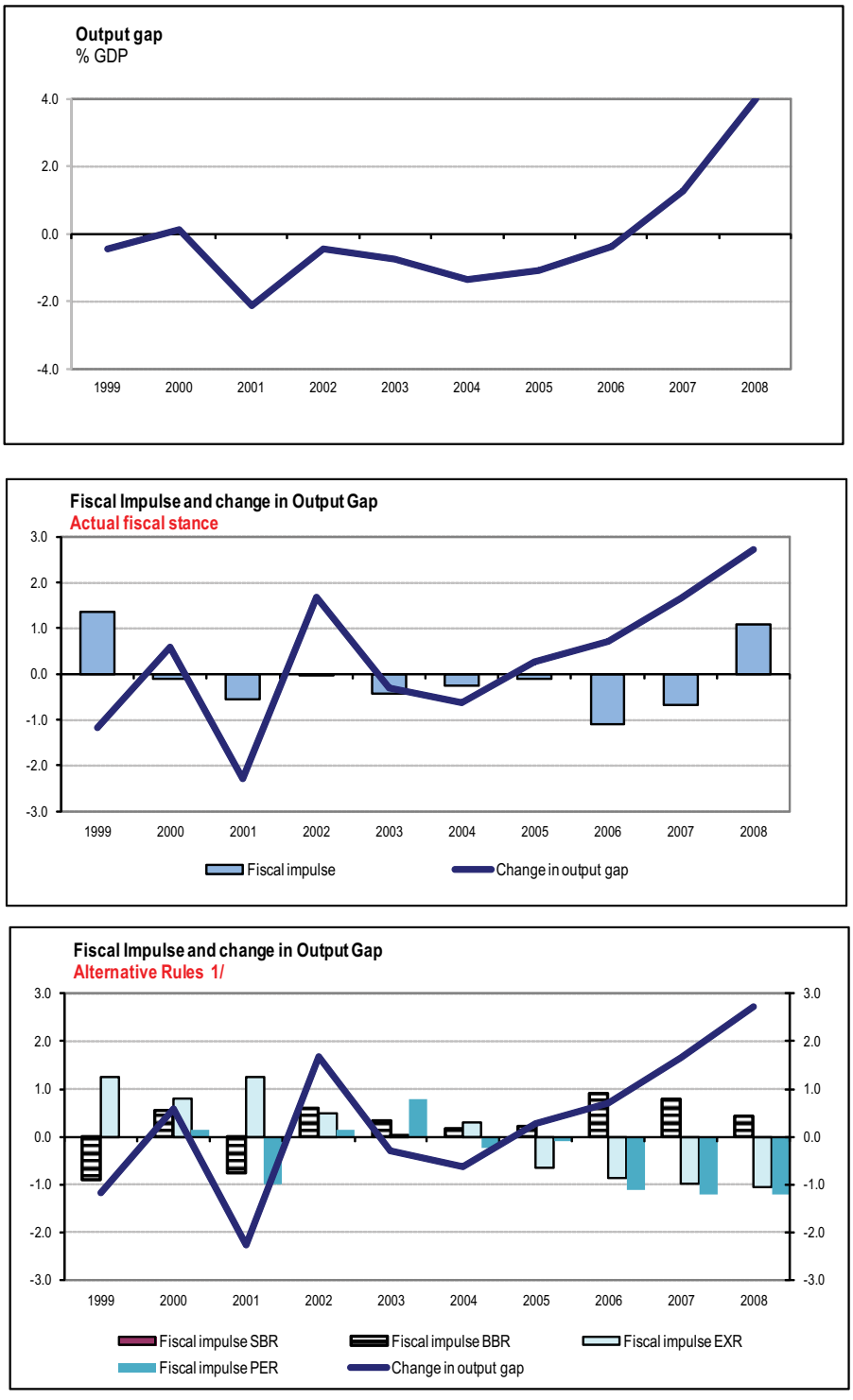
Table 1. Comparative Performance of Alternative Fiscal Rules, 1998−2008.

Indicator (in % of GDP, unless otherwise stated)	Actual data 1998-2008	Alternative Rules applied over the period			
		Balance Budget Rule	Exp. Rule 5.5% real change	Structural Balance Rule	Peruvian theoretical Rule
A. Sustainability					
Average gross debt in the period	39.7	38.7	42.7	39.6	38.7
B. Cyclicality					
Cummulative Fiscal Impulse over the period (+) procyclical; (-) countercyclical 1/	-1.1	4.7	-2.6	0.0	-2.9
C. Fiscal effort					
Minimum change in primary expenditure in one year (real change)	-3.7	-6.9	5.5	-1.2	-6.5
D. Volatility					
Standard deviation of real primary expenditures (real change)	5.9	8.7	0.0	4.6	4.7
E. Accumulation of overall surpluses in "good" years					
("good" year GDP growth > than potential)	7.0	0.0	0.0	1.0	10.2

Source: Staff estimations.

1/ Cumulative pro-cyclical impulses over the reference period (as proposed by *Debrun, et altri (IMF WP/08/87*).
That means improvements in the primary balance during bad times, and deteriorations of the primary balance in good times (in % GDP).

Figure 1. Output Gap, change in Output Gap and Fiscal Impulse, 1998−2008



Source: Staff estimates.
1/ BBR (balance budget rule); EXR (expenditure rule); SBR (structural balance rule); PER (Peruvian rule).

Application of Alternative Rules for 2009−2015

11. To illustrate how alternative rules would perform under different macroeconomic conditions, we use both a deterministic and a stochastic approach. This results in two sets of exercises: (i) we simulate the rules under three different deterministic scenarios (Box 2); and (ii) to give a more nuanced assessment of the uncertainty surrounding fiscal variables, we simulate the rules under stochastic scenarios. For the later, we use a modified version of the *Celasun, Debrun, and Ostry* algorithm, where we estimate the joint probability distributions of economic shocks faced by the Peruvian economy to construct a large number of scenarios that capture covariances among disturbances as well as dynamic response of the economy.[6] Based on actual data for 2008, we assume that the rules are implemented in 2009 and are binding and met every year.

(a) Deterministic scenarios

12. We use three deterministic scenarios—a baseline, a growth boom-bust, and a negative commodity price shock—to compare the performance of alternative fiscal rules. Details of the assumptions used in each scenario are presented in Box 2, whereas Table 2 and Figure 2 show main results of the simulation exercise.

13. The results suggest that a structural balance rule would smooth expenditure patterns over time and reduce the cyclical bias of other rules. Despite that it could lead to somewhat higher debt levels, this risk remains well-contained.

- In all cases, debt remains below 30 percent of GDP, suggesting no sustainability concerns in the next five years in any of the scenarios. It should be noted that, in general, the structural balance rule leads to higher levels of debt, even though debt remains stable in the different scenarios.

  All the rules show a predictable fiscal stance over the cycle. Under the balance budget rule, fiscal stance remains highly pro–cyclical in all scenarios, particularly in the boom-bust case. The expenditure rule, and to a lesser extent, the Peruvian theoretical rule results in a countercyclical stance, except in the case of a boom-bust scenario where they become pro–cyclical (see Figure 2).

[6] O. Celasun, X. Debrun, and J.D. Ostry (2006), *"Primary Surplus Behavior and Risk to Fiscal Sustainability in Emerging Market Countries: A Fan-Chart Approach"*, WP/06/67.

Box 2. Deterministic Scenarios

The following three scenarios were used to analyze the performance of alternative fiscal rules:

- **Baseline scenario:** Growth is assumed to reach 6.3 percent in 2010 and gradually converge to the potential growth rate by 2013 closing the output gap. After a moderate increase in 2010, commodity exports remain broadly constant for the rest of the period
- **Boom-bust scenario:** Real growth is assumed to peak in 2010 and 2013 deteriorating sharply in the following years. Commodity exports do not contribute to the volatility of the output gap, remaining at the baseline levels.
- **Commodity price shock:** Commodity prices are assumed to decrease further in 2010 causing a negative output gap of 3.0 percent of GDP in 2010. The shock dissipates only gradually in subsequent years.

GDP Growht Rates and Commodity Exports Assumed in Simulation Exercises

(Percent change)	2008	2009	2010	2011	2012	2013	2014	2015
GDP growth								
Baseline	9.8	1.0	6.3	6.0	5.8	5.5	5.5	5.5
Boom-bust	9.8	1.0	11.3	0.1	6.5	7.6	6.4	3.1
Commodity price shock	9.8	1.0	4.2	7.3	5.9	5.7	5.5	5.5
Mineral exports								
Baseline	8.2	-20.3	12.7	3.4	-0.7	-0.8	-1.2	-1.6
Boom-bust	8.2	-20.3	12.7	3.3	-0.7	-0.8	-1.2	-1.6
Commodity price shock	8.2	-20.3	-20.0	31.1	5.5	5.2	0.0	-0.4
Oil exports								
Baseline	15.5	-37.6	22.6	7.9	3.4	2.1	2.3	2.8
Boom-bust	15.5	-37.6	22.6	7.9	3.4	2.1	2.3	2.8
Commodity price shock	15.5	-37.6	-31.9	56.3	30.0	7.7	2.9	0.7

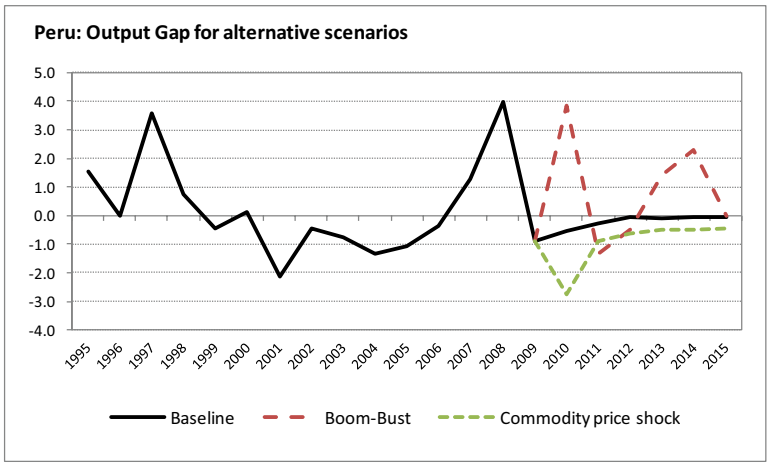


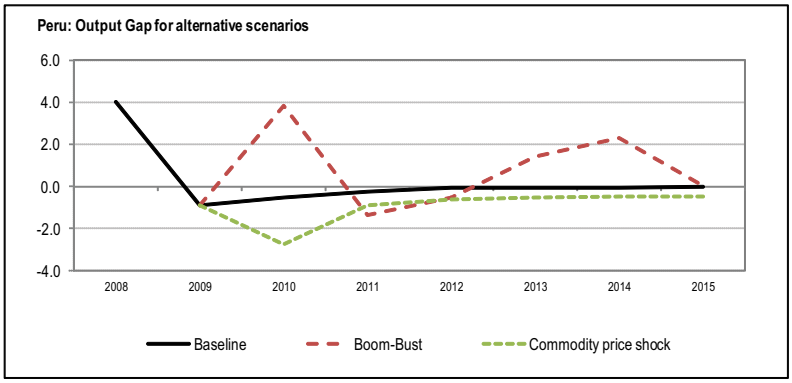
Table 2. Comparative Performance of Alternative Fiscal Rules, 2009−2015

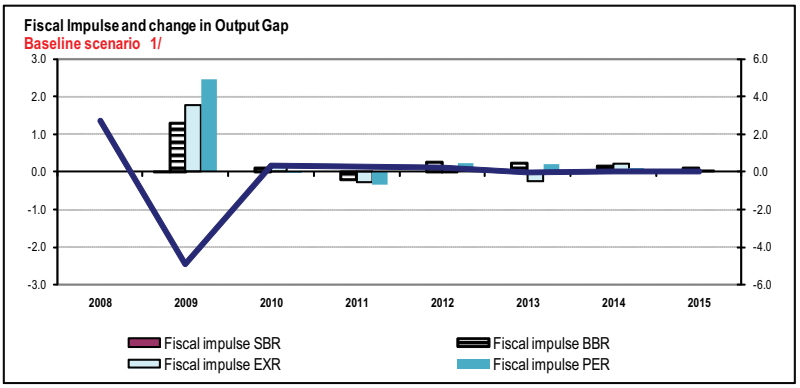
In % of GDP, unless otherwise indicated	Alternative Rules applied over the period, 3 stocastic scenarios											
	Baseline				Boom-Bust				Commodity price shock			
	Balance Budget Rule	Exp. Rule 5.5% real change	Structural Balance Rule	Peruvian theoretical Rule	Balance Budget Rule	Exp. Rule 5.5% real change	Structural Balance Rule	Peruvian theoretical Rule	Balance Budget Rule	Exp. Rule 5.5% real change	Structural Balance Rule	Peruvian theoretical Rule
A. Sustainability												
Average debt in the period	22.3	22.5	25.9	24.2	23.9	24.3	26.0	25.2	25.4	27.4	25.7	24.3
Debt stock in 2015	18.1	17.9	24.1	21.3	21.6	22.0	24.4	24.0	25.3	26.9	23.9	23.5
B. Cyclicality												
Cummulative Fiscal Impulse over the period (+) procyclical; (-) countercyclical 1/	0.2	-1.4	0.0	-0.7	3.6	1.3	0.0	0.8	1.3	-5.1	0.0	-0.4
C. Fiscal effort												
Minimum change in primary expenditure in one year (real change)	4.8	5.5	4.3	4.6	2.9	5.5	2.6	2.8	-12.2	5.5	-8.8	-11.6
D. Volatility												
Standard deviation of primary expenditures (real change)	1.8	0.0	1.2	1.4	2.2	0.0	1.7	3.6	7.5	0.0	7.1	8.0
E. Accumulation of overall surpluses in "good" years												
("good" year GDP growth > than potential)	0.0	0.3	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

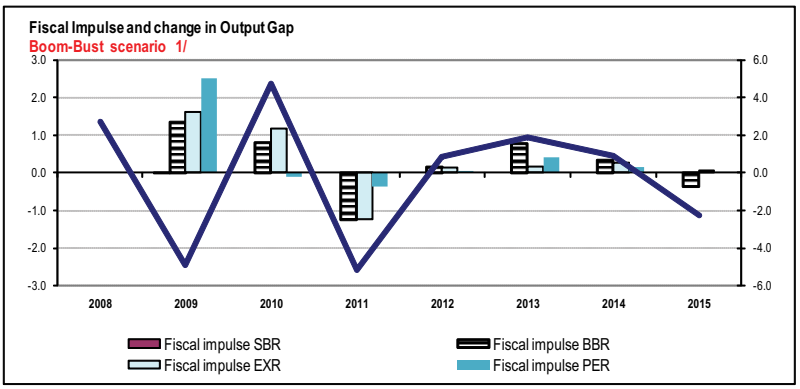
Source: Staff estimations.

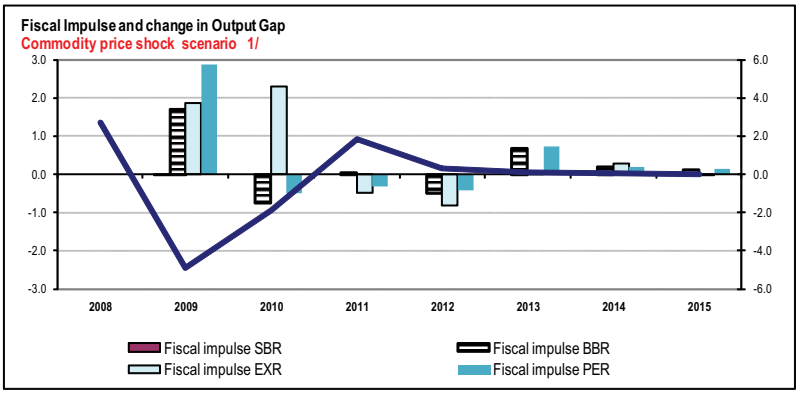
1/ Cumulative pro-cyclical impulses over the reference period (as proposed by *Debrun, et altri IMF WP/08/87*).
That means improvements in the primary balance during bad times, and deteriorations of the primary balance in good times (in percent of GDP).

Figure 2. Output Gap, Change in Output Gap, and Fiscal Impulse, 2009−2015









Source: Staff estimates.

1/ BBR (balance budget rule); EXR (expenditure rule); SBR (structural balance rule); PER (Peruvian rule).

- Fiscal effort and volatility of primary expenditures remain lower in the expenditure rule, followed by the structural rule.[7] The Peruvian theoretical rule shows a similar spending pattern to the balance budget rule, where fluctuation in revenues are followed by corresponding adjustments in expenditures. In this regard, the structural balance rule would smooth expenditure pattern and absorb part of the risks of spending fluctuations associated with unexpected macroeconomic shocks.
- The Peruvian theoretical rule allow for building up fiscal buffers in good times under the baseline scenario. However, no significant accumulation of assets would be possible under any rule in the rest of the scenarios.

(b) Stochastic scenarios

14. An assessment of the risks of alternative fiscal rules warrants incorporating explicitly the probabilistic nature of fiscal variables. The three scenarios presented in the previous section give a broad sense of the sensitivity of fiscal variables to alternative rules and a range of likely shock combinations. Yet, the deterministic approach has significant methodological limitations, particularly in a volatile macroeconomic environment. To account for the effect of uncertainty in fiscal projections, this section seeks to assess alternative fiscal rules under a more realistic constellation of shocks.

15. The simulations comprise three steps. First, we impose, one at a time, four fiscal rules as a predetermined fiscal behavior for every year of the forecasting horizon;[8] second, we calibrate the distribution of shocks to fit the statistical properties of historical data for Peru;[9] and finally, we combine the predetermined fiscal rules with the stochastic scenarios to produce annual paths for the main fiscal variables: debt, primary balance, and primary expenditures. We use fan charts to depict confidence bands of varying degrees of uncertainty around the median projection for each

[7] By construction, volatility is lower under the expenditure rule when measured as the standard deviation in real primary expenditures. However, when measured as percent of GDP, the structural rule is less volatile.

[8] Since our objective was to simulate the implementation of alternative fiscal rules, we depart from the *Celasun, Debrun, and Ostry* algorithm in that we did not incorporate a fiscal reaction function. Instead, we imposed each alternative rule as a predetermined fiscal behavior to be binding and met every year of the forecasting horizon.

[9] The historical properties of the Peruvian data are captured in an unrestricted VAR model which: (i) describes comovements among the determinants of debt dynamics (GDP growth, commodity prices, domestic and foreign interest rates, and exchange rate); (ii) estimates the conditional variances and covariances of the shocks; and (iii) generate a consistent set of projections for the determinants of debt (one thousand stochastic scenarios).

fiscal variable—which corresponds to the baseline scenario presented above. The fan-charts resulting from this exercise are presented in Table 3.[10]

16. Stochastic scenarios provide the risk profile of different fiscal rules. The probability distributions of main fiscal variables can prove to be especially useful for policymakers to manage fiscal risks to acceptable levels. It is important to acknowledge that the simulated frequency distributions of fiscal variables are not the true probability distributions at a point in time, since structural changes may have affected variances and co–variances. The assessment is contingent on the historical period over which the VARs are estimated.[11] Wide confidence intervals inevitably reflect past crises, and may thus overestimate the true magnitude of risks.

17. The key results are the following:

- Overall, the outcome of the deterministic scenarios falls within the 30 percent confidence interval, confirming that deterministic stress tests do not account for the overall risks inherent to fiscal variables. Fan chart analysis provides a more reliable picture of the uncertainty surrounding fiscal variables.
- For all the rules the median debt path remains sustainable (i.e., the debt ratio is stable or declining over the simulation horizon). However, in the expenditure rule and, to a lesser extent, in the structural balance rule we observe growing debt ratios in the second and third deciles. Thus, in extreme cases, there is at least a 30 percent chance that a combination of adverse shocks may lead the debt to GDP ratio to increase up to 40 percent, which is still within reasonable limits.
- Under the Peruvian theoretical rule, and to a lesser extent, in the expenditure rule we observe negative debt ratios at the end of the period (a creditor position) in the three lower bands. Thus, there is a probability of accumulating a significant amount of financial assets.
- Under the balance budget rule, by construction, the primary balance and therefore debt risks are contained, while the expenditure pattern is very volatile.
- Under the structural balance rule, there is a small chance that the debt ratio will increase slightly above 30 percent of GDP, but the volatility of expenditures is very limited.[12]

[10] Fan charts summarize risks to fiscal variables dynamics by representing the frequency distribution of a large sample of paths generated by means of stochastic simulations. Different colors delineate deciles in the distribution of fiscal variables, with the zone in dark blue representing the 20 percent confidence interval around the median projection and the overall colored cone, a confidence interval of 90 percent.

[11] In this case, we used quarterly data from 1993−2008.

[12] Here volatility refers to the expenditure to GDP ratio.

- Under the expenditure rule, while volatility of expenditures is low, risks are high in terms of debt since the primary surplus is very volatile. This is an important difference between the expenditure rule and the Peruvian theoretical rule. While both rules show a similar fluctuation pattern for primary expenditures, the Peruvian rule has lower debt risk, since it caps the overall balance reducing the risks of debt increasing over 30 percent of GDP.[13]
- It should be noted that, while the structural balance rule shows the lowest volatility of primary expenditure to GDP ratio (Table 3), the expenditure rule leads to a smoother spending pattern when volatility is measured as the standard deviation of real primary expenditures (Table 2).

III. Policy Considerations

18. The selection of a fiscal rule should be guided by its performance relative to a prioritized set of fiscal policy objectives. There is no one-size-fits-all fiscal rule that would always and everywhere be ideal. Priorities of fiscal policy may change, once policies succeeded in achieving certain goals such as reducing public debt. The current rule has proved instrumental for debt consolidation, and consideration is being given now to reducing pro-cyclicality.

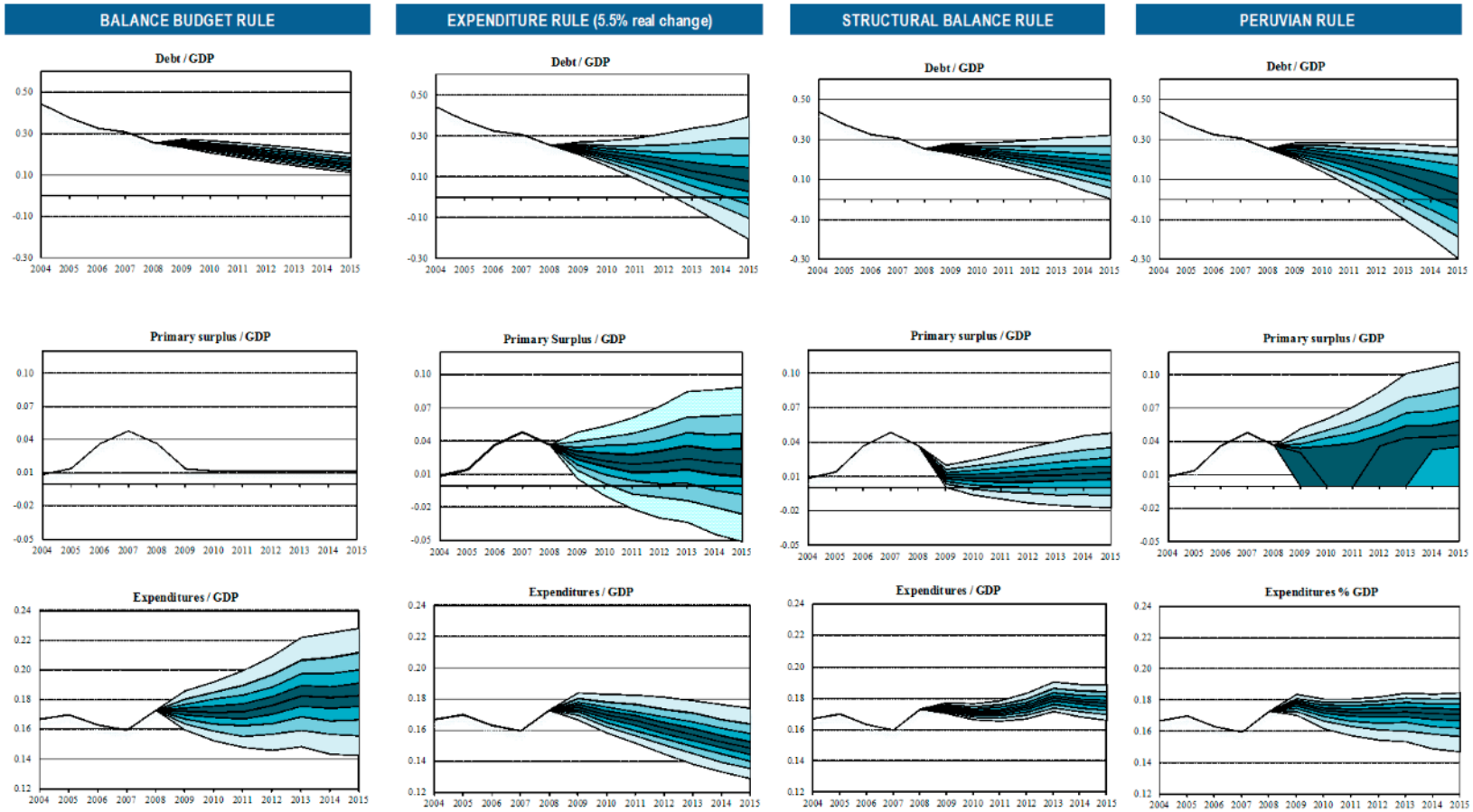
19. Peru's FRTL was very successful in reducing the debt ratio, being opportunistic in good times and conservative in bad times. In earnest, fiscal buffers built in recent years proved very important to implement the fiscal stimulus plan in 2009. Yet, controlling spending growth has been challenging over the years, with caps difficult to enforce—particularly at a sub–national level.

20. Moving to a structural balance rule poses significant challenges in the short-term, but it can help over the medium-term to institutionalize past prudent policies. Adopting a structural rule requires that important economic and institutional preconditions be met (Annex 1). But a structural fiscal approach can be beneficial, once debt sustainability and financing **constraints** are no longer of concern, by separating temporary effects related to the business cycle and commodity prices, limiting volatility of public expenditures, and reducing potential pro-cyclicality.

21. Changing current parameters of the FRTL can replicate some features of a structural approach, while retaining debt limit objectives. The design of the FRTL, with deficit and expenditure growth limits, has an embedded flexibility to adapt to evolving objectives. Adjusting the current parameters of the FRTL, mainly through changes in expenditure caps, could shift the focus of fiscal policy closer to a structural approach, reducing pro-cyclicality bias and retaining debt limit objectives, which still remain important to the authorities.

[13] The overall deficit cannot exceed 1 percent of GDP therefore its distributions is skewed towards the downside.

Table 3. Comparative Performance of Alternative Fiscal Rules under Stochastic Scenarios, 2009−2015



Source: Staff estimates.

Annex 1. Structural Fiscal Rules: Implementation Challenges

22. There is a trade-off between potential benefits of a structural rule and its implementation challenges. Accepted preconditions for the introduction of a new rule in general, and of a structural balance rule in particular, may require time in Peru. We focus on implementation challenges arising during the transition period toward a structural rule.

Appropriate Timing[14]

23. Regardless of the rule selected to improve the fiscal policy framework, appropriate timing for introducing the rule is crucial for its success. Extraordinary situations, such as the current global financial crisis, may not be conducive to introducing a new rule. Caution suggests that any change should be introduced gradually and be linked to a medium-term objective. In the context of an unusual level of uncertainty, the introduction of a new rule, or a rapid return to previous fiscal targets implied by the existing rule, may be politically and economically challenging. The authorities may not be ready to support a new fiscal framework since it involves credibility risks, while the required adjustment to return to the existing rule may be excessive and/or not politically feasible. Consequently, the authorities face at least two challenges: first, selecting the appropriate rule under high uncertainty; and second, managing the time table to introduce any change to current fiscal strategy.

24. International experience suggests that fiscal rules should not be introduced in an excessively uncertain economic environment. Under these circumstances, a gradual approach focused on medium-term targets is preferable. In the case of Peru, the analysis suggests that adjusting the parameters of the existing rule could approximate the results obtained under a structural rule—e.g., setting the real expenditure cap at the potential GDP growth rate, extending its coverage to primary expenditures of the general government, while preserving the deficit limit of 1 percent of GDP for the nonfinancial public sector. Nonetheless, it may be helpful to design and announce early-on a credible medium-term rule-based framework, and a time table for its introduction, or for a return to the existing rule or a modified version, as appropriate.[15] Meanwhile, preparatory steps could be undertaken to ensure a successful implementation of a structural rule.

Fiscal Consolidation and Macroeconomic Stability

25. Progress achieved in terms of fiscal consolidation and macroeconomic stability facilitates the transition to a new fiscal framework. In this context, a low debt level

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[14] This section draws heavily from "*Fiscal Rules: Anchoring Expectations for Sustainable Public Finances"* IMF, Policy Paper, November.

[15] For example, the German fiscal rule, recently modified, provides a transition period of five years during which substantial adjustment is envisaged before the rule becomes operational.

resulting of past fiscal consolidation is a prerequisite for implementing a structural rule. During recent years, Peru has shown steady fiscal surpluses and declining debt vulnerabilities. Public debt has been reduced in terms of international comparison, but some concerns remain. Public debt is still highly dollarized, regardless of significant efforts done by the authorities in recent years. Subnational government constrains to borrow internationally have been recently relaxed, which could become a concern in the future. Contingent liabilities related to public servant pension schemes may add pressures on current debt level.

26. Adopting a structural balance rule at the time when the output gap is close to zero would minimize medium-term debt risks. A structural balance rule would increase debt risks derive from unexpected shocks. Under the current rule, risk from negative shocks are fully absorbed by the adjustment of expenditure (above an overall deficit of 1.0 percent of GDP), thus reducing the impact on the debt ratio. Under the structural rule negative shocks would increase the fluctuation of the primary balance that would translate in larger debt ratios. Based on the results presented in previous sections, under the baseline scenario the output gap would be closed by 2012. However, current debt levels are already low, which may allow the authorities to move quicker towards a structural balance rule, or even propose a small structural deficit, without jeopardizing debt sustainability.

27. The choice of the target for the structural rule should be guided both by social and macro policy objectives. Given the low medium-term debt risks, the significant infrastructure gap, and poverty reduction goals, it could be argued that a structural rule that allows for a small structural deficit could serve well current policy objectives. In the past, it was clear that one of the main fiscal policy objectives was the debt consolidation. At present, given the success of past policies, a balance structural rule may seem too restrictive. However, the need of rebuilding financial buffers and avoiding political pressures to increase public spending together with low enforcement capacity of expenditure caps at a subnational level, warrants exercising caution.[16]

Institutional requirements

28. Structural rules require strong institutions. This entails strong commitment to transparency, well-established policy credibility, and good governance structure and quality of institutions. Additionally, structural rules require good forecasting and planning capacity, as well as strong accounting and information systems.

29. Despite several reforms to strengthen fiscal policy through the adoption of a new legal framework, some weaknesses remain in the Peruvian PFM.[17] Recent TA missions have

[16] It should be noted that the simulations shown in previous sections included a structural balance rule just for illustration purposes, not as a position on the optimal level of the structural surplus.

[17] The framework includes a financial administration law (2003), and treasury (2006), accounting (2006), and budget (2004) laws.

focused on some shortcomings of the budgetary process, mainly the financial management information system (SIAF), the budget classification and chart of accounts,[18] the treasury management,[19] and the organization of the Ministry of Finance. In addition, risks to public investment have increased in the last years with the relaxation of some regulations for assessing and approving investments in the context of efforts to implement the stimulus plan. It is crucial that these institutional weaknesses are resolved before moving towards a structural rule.

30. Given well know technical difficulties in implementing structural rules,[20] an independent agency with responsibility for auditing and/or determining the dating of the cycle could help to increase policy credibility. However, delegating core aspects of fiscal policy to an independent agency may raise political concerns. The authorities should feel comfortable delegating this function to outsiders, which may warrant a trial period.

Fiscal Decentralization

31. Structural rules are easier to implement when a centralized budget process overseen by a powerful Ministry of Finance is in place. Budgetary procedures should be conductive to the rule's smooth operation. In highly decentralized economies, such as Peru, additional challenges arise in the implementation of a structural rule. Weak fiscal policy coordination between central and subnational levels combined with a high degree of budget decentralization, might well interfere with the ability to comply with national fiscal targets.[21] This again, raises concerns about the appropriate allocation of fiscal targets across government levels, and overall, about the feasibility of adopting a structural rule in the short-term.

32. Overall, authorities should take a gradual approach in moving forward a structural rule. Carefully calibrating its timing and formalizing the rule once the benefits are proved, will be crucial for its success. Finally, special attention should be given to ensuring that the structural rule is clearly linked to a medium-term objective and supported by a strong institutional and legal framework.

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[18] The authorities have finalized the development on manual on a new budget classification and a chart of accounts consistent with international standards *(GFSM 2001)*. However, progress in still needed in the complete integration of the budget classification and the chart of accounts and its incorporation in a new technological platform.

[19] The treasury has taken some measures to improve cash management and create a TSA. These include daily sweeps to TSA accounts with resources invested in central bank instruments and work to modify the SIAF to generate outputs in a format that replicates that of a treasury-general-ledger.

[20] Such as choosing the optimal level to target for the structural balance, determining mineral prices to project revenues, defining output gap, etc.

[21] Afonso, A. and Hauptmeir (2009) noted that for the EU 27 countries an increase in the ratio of subnational spending over central government spending contributes to an increase in the total primary spending-to-GDP ratio in the subsequent period. Working Paper Series, No. 1054, ECB.

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What to Expect when you are Expecting...Large Capital Inflows? Lessons from Cross-Country Experiences

Given the positive economic outlook and strong fundamentals, Peru is likely to experience large and sustained capital inflows over the next few years, linked to a permanent shift in foreign investors' interest. This chapter[1] *reviews the experience with large and sustained capital inflows to emerging market countries and some advanced economies. An average episode lasted for 8 years with cumulative net inflows of 64 percent of GDP. Countries with successful episodes, defined as those in which growth did not decline abruptly, showed: higher growth during the episode, driven primarily by private sector investment; a lower widening of the current account deficit; and a significant increase in foreign assets afterwards. The analysis showed that in successful cases a mixed policy response allowed for a widening of the current account deficit, some appreciation of the exchange rate and accumulation of international reserves, and a restrained fiscal policy that helped dampen domestic demand pressures.*

I. Background

33. Capital inflows to emerging markets have already started to rebound in the aftermath of the recent financial crisis. As risk appetite and global liquidity improves, and favorable world economic conditions re-emerge, emerging market with strong fundamentals and positive economic prospects are expected to benefit strongly from renewed capital inflows. These inflows, however, create important challenges for policymakers because of their potential to generate domestic imbalances; loss of competitiveness; and increased vulnerabilities.[2] Given its bright economic outlook, staff's view is that Peru may receive sizable and lasting capital inflows over the medium term.

34. The main objective of this chapter is to review the international experience with episodes of large and lasting capital inflows. It identifies episodes of large capital inflows in emerging market economies and some advanced countries (section II), and examines the behavior of macroeconomic indicators before, during, and after those episodes (section III).[3] Section IV discusses some policy challenges. The chapter draws interesting lessons for Peru. An average episode lasts for 8 years, with cumulative net capital inflows of almost 65 percent of GDP, sizable reserve accumulation of 20 percent of GDP, and a cumulative appreciation of the

[1] Prepared by M. Vera Martin (WHD). The author would like to thank Martin Kaufman, Rodrigo Valdes for extensive discussions and participants at the BCRP and WHD-IMF seminars for their feedback.

[2] Inflows are defined as purchases by non–residents of domestic assets less their sales of such assets. Outflows refer to purchases by residents of foreign assets less their sales of such assets.

[3] For details about the sample and data sources, see Appendix 1.

REER of 30 percent. The sizable inflows and the scope to absorb those pose significant challenges. Economies with successful episodes reported higher economic growth during the episode, driven primarily by private sector investment; were able to maintain higher growth afterwards; and had lower current account in parallel with a significant increase in foreign assets afterwards.

II. Identifying Periods of Large Capital Inflows

35. Episodes of large net capital inflows were identified according to two criteria:

- **Country-specific criteria:** An episode of large capital flows is defined as one in which there is at least a year for which the deviation of the net capital inflows to GDP ratio (NKFGDP) from its trend is above one historical standard deviation, and includes all the surrounding years for which the net capital flows are higher than the country-specific average over the whole sample. Episodes considered must have at least cumulative 20 percent of GDP in net inflows.[45]

- **Cross-country criteria***:* An episode of large capital inflows is defined as one in which cumulative flows for at least 4 years amount to a minimum of 20 percent of GDP and includes all years in which the NKFGDP ratio is above the time-varying average for the sample. By allowing for a time-varying average, the identification somehow takes into account the state of global liquidity and risk aversion conditions for emerging market economies.

Table 1: Episodes of Large and Sustained Capital Inflows, 1990-2009

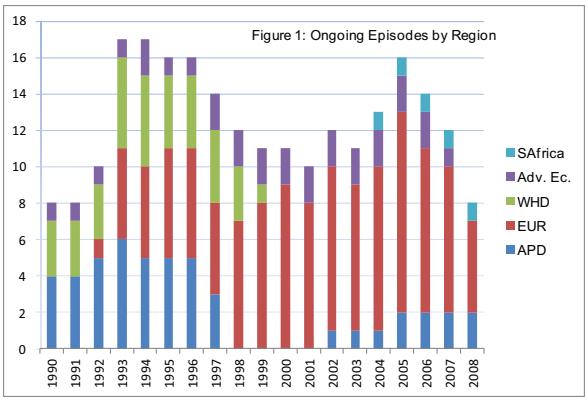
Country	Period	Cumulative Flows	Duration	Average flow per year
FIN	1990-94	19.4	5	3.9
AUS	1997-2006	50.1	10	5.0
NZL	1994-2007	84.9	14	6.1
TUR	2004-07	36.0	4	9.0
ZAF	2004-08	26.4	5	5.3
ARG	1993-99	37.5	7	5.4
CHL	1990-97	48.1	8	6.0
COL	1993-98	26.2	6	4.4
MEX	1990-94	29.7	5	5.9
PER	1990-98	38.2	9	4.2
IND	2002-08	28.4	7	4.1
IDN	1990-96	25.7	7	3.7
MYS	1990-93	45.8	4	11.5
PHL	1990-97	59.3	8	7.4
THA	1990-96	72.3	7	10.3
BGR	1992-93	27.4	2	13.7
	2002-08	165.7	7	23.7
CHN	1993-97	21.9	5	4.4
UKR	2005-07	28.8	4	7.2
CZE	1993-96	40.6	4	10.1
	1998-2005	56.2	8	7.0
SVK	1995-2005	118.1	11	10.7
EST	1993-2008	162.0	16	10.1
LVA	1994-2007	183.1	15	12.2
HUN	1993-95	36.1	3	12.0
	1998-2006	84.3	9	9.4
LTU	1993-2008	148.0	16	9.2
SVN	1999-2002	20.5	4	5.1
POL	1995-2000	35.1	6	5.8
	2005-08	26.9	4	6.7
ROU	2000-08	103.8	9	11.5
	No. episodes			31
	Max		16	24
	Min		2	4

Source: BOPS and author's calculations

[4] The exception is Finland, where the episode reached cumulative flows of 19½ percent of GDP, and was included to provide diversity from advanced economies.

[5] For each country in the sample, the trend is computed using the Hodrick-Prescott filter, with a λ equal to 100.

36. 31 episodes of sizable capital inflows were identified, with an average duration of 8 years (Table 1). About half of the episodes took place in the 1990s. The variation in the volume of flows relative to GDP per episode increased over time, which could indicate investors' discrimination across countries and/or limited absorption capacity of inflows due to narrower financial markets. Australia, New Zealand, and the Baltics reported episodes with the longest duration (over a decade). Latin America and Emerging Asian dominated the episodes in the 1990s, whereas the episodes in the 2000s concentrate in emerging Europe and other new emerging markets (Figure 1). The Baltic countries, together with Bulgaria, Slovak Republic, and Romania, report episodes of capital inflows well above 100 percent of GDP. The number of episodes peaked in the mid-1990s, ahead of the Asian financial crisis, and in the mid-2000s, ahead of the 2007 global financial crisis, when there was significant global liquidity.



37. More than half the episodes ended abruptly. Eight episodes ended with a sizable reversal in the financial account and four episodes reported steep depreciation of the exchange rate.[6] For countries with a reversal in the financial account, capital inflows during the last year of the episode averaged 7 percent of GDP, and net capital outflows of 3 percent of GDP in the aftermath of the episode. Countries with significant exchange rate depreciation and no financial account reversal suffered from a sizable decline in capital flows at the end of the episode (over 5 percent of GDP). Additionally, seven episodes were identified as being affected by a sudden stop—defined as a decline in the ratio of net private capital inflows to GDP at the end of the episode of at least 6 percentage points of GDP.

38. During the episodes, large capital inflows resulted in a significant widening of the current account, some accumulation of reserves and appreciation of the real effective

Table 2: External Sector Developments in Emerging Markets, 1990-2008
(annual average, in percent of GDP, unless specified)

	Non-Episodes	Episodes	Diff.
Net capital flows	0.3	8.4	*8.0*
Gross capital flows	5.3	11.1	*5.8*
Gross foreign assets	-5.0	-2.9	*2.2*
FDI	1.3	3.8	*2.5*
Portfolio flows	-0.3	1.2	*1.5*
Other flows	-0.7	3.4	*4.0*
Portfolio and other flows	-0.9	4.5	*5.5*
Current account	1.3	-5.7	*-7.0*
Reserve accumulation	-1.4	-2.5	*-1.1*
REER (% change)	1.0	3.8	*2.9*

Source: BOPS, WEO.

[6] Defined as a depreciation of the real effective exchange rate of at least 25 percent cumulative over a year (Mexico), or at least 10 percentage points greater than in the preceding year (South Africa, Peru, and Philippines).The analysis excludes the episodes that ended in 2008.

exchange rate (Table 2). This result is in line with previous evidence from the literature (Reinhart and Reinhart (1998, 2008)). An average episode is characterized by cumulative net flows of 68 percent of GDP (88 percent of GDP for gross inflows), reserve accumulation of 20 percent of GDP, and a cumulative appreciation of the REER of 30 percent. Net capital inflows per year reached 8½ percent of GDP, with annual gross inflows surpassing 11 percent of GDP. Residents' investments abroad are lower than the non-episode period (3 percent of GDP versus 5 percent of GDP). Net FDI triples during episodes, and portfolio and other flows reached an average annual inflow of 4½ percent of GDP compared to practically no inflows during the non-episodes. Episodes show a significant widening of the current account of nearly 6 percent of GDP, exchange rate appreciation (about 4 percent per year), and higher reserve accumulation (about 2.5 percent of GDP).

39. GDP growth doubles during the episodes, driven by domestic demand (Table 3). Inflation also rises, signaling some demand pressures. Real total domestic demand increases by 7 ½ percentage points of GDP during episodes, with a remarkable increase in private sector investment and consumption. On average, private sector consumption increases by 3½ percent of GDP to 62 percent of GDP. While private sector investment reaches almost 21 percent of GDP, compared to 16½ percent of GDP during non-episodes. National savings declined during the episode (by 4 percentage points of GDP), driven by a decline in private sector savings.

Table 3: Real Sector Developments in Emerging Markets during Periods of Large Capital Inflows

(annual average, in percent of GDP)

	Non-Episodes	Episodes	Diff.
Real GDP growth	2.6	4.8	*2.2*
Inflation	12.5	14.6	*2.1*
Real Total Domestic Demand	97.1	104.6	*7.5*
Public consumption expenditure	15.6	16.0	*0.4*
Private consumption expenditure	58.8	61.9	*3.1*
Gross capital formation	22.6	26.4	*3.9*
Public	5.7	5.3	*-0.4*
Private	16.6	21.2	*4.5*
Gross national savings	24.1	20.6	*-3.5*
Public	3.2	2.9	*-0.3*
Private	20.9	17.8	*-3.0*
General Government Balance	-2.1	-1.7	*0.3*

Source: WEO

III. Successful and Unsuccessful Episodes

40. This section separates successful and unsuccessful episodes and investigates the evolution of external and real sector variables in the run-up, during, and in the aftermath of the episodes. Surges in capital inflows could result in a worsening current account, appreciating real exchange rates, and rising asset prices; which can be the onset of currency and banking crises.[7]

[7] See Kamisky and Reinhart (2000), and Edwards (2004, 2007) for further discussion.

41. An episode is considered successful if it leads to a smooth adjustment in GDP growth or the current account after the episode. There are many valid metrics to analyze episodes of large capital inflows. The analysis discriminates between successful and unsuccessful episodes by taking into account two different criteria: growth performance and current account adjustment following the capital inflow episode. An episode is considered successful if the difference between the average real GDP growth during the episode and two years after the episode is above the median adjustment for all episodes. Similarly, an episode is considered successful if the adjustment in the current account after the episode is below the median adjustment.[8]

Differentiating Episodes According to Growth Performance

42. Countries with successful episodes increased marginally growth, but are able to maintain it afterwards (Table 4). Overall, growth is higher than in unsuccessful episodes, although countries with unsuccessful episodes grew at a higher rate during the episode showing the typical boom and bust pattern.[9] They however suffered from a significant economic slowdown afterwards, with growth declining by 5 percentage points to 1 percent per year. Countries with successful episodes increased investment annually by 3 percent of GDP during the episode, driven by the private sector. Public sector consumption and investment do not expand in successful episodes; while public sector added about 4¼ percent of GDP annually to domestic demand in the unsuccessful cases (of which 2½ percent of GDP was due to an increase in public sector consumption). Both private sector consumption and investment increased during the successful episode (about 5 percent of GDP) while private sector investment after the episode remained higher than the pre-episode level. In contrast, in

Table 4: Real Sector Developments in Emerging Markets during Periods of Large Capital Inflows (in percent of GDP)

	Unsuccessful			Successful		
	Before	During	After	Before	During	After
Real GDP growth	2.7	5.8	0.8	4.9	5.2	4.8
Public consumption expenditure	13.2	15.7	13.2	16.8	16.6	16.0
Private consumption expenditure	60.3	60.2	60.2	60.7	62.6	58.9
Gross capital formation	22.9	25.3	23.6	22.6	25.5	24.7
Public	3.8	5.6	6.8	4.8	4.9	5.5
Private	17.2	19.6	16.1	17.2	20.1	18.8
Gross national savings	23.5	21.9	24.2	22.6	19.5	21.7
Public	2.3	3.2	1.7	2.0	2.6	2.5
Private	20.9	18.7	22.6	20.0	17.1	19.7
General Government Balance	-2.8	-0.3	-3.6	-2.8	-3.0	-2.4
Central Government Balance	-2.8	-0.1	-3.1	-2.3	-2.9	-2.5
Inflation	18.5	10.4	12.4	13.5	10.2	10.2
Real Total Domestic Demand	94.9	103.5	97.4	99.2	105.8	101.9

Successful episodes have a smoother adjustment of the real GDP growth once the episode is finished.
1/ Before (after) refers to three years before (after) the episode.
Source: BOPS, WEO.

[8] For episodes that expand through 2008, the analysis considers growth or current account in 2008.

[9] External and real sector variables behaved differently during the episode. T-tests for equality of means between the before and during periods showed statistically significant differences in the pattern of external and real sector variables. The null hypothesis was rejected for all variables—except for the national gross savings at the aggregate level. The test results, however, showed statistically significant different means for private and public sector savings. The results are independent of the nature of episode considered. Results are not reported here but available upon request.

unsuccessful cases, private sector investment declined below the pre-episode level by 1 percent of GDP (to 16 percent).

43. Successful episodes show higher net inflows, with a lower current account widening and higher reserve accumulation, and a more gradual but larger appreciation (Table 5).

Despite that there is no significant difference in the size of the gross inflows (a sizable annual flow of 11 percent of GDP), nor in the composition of the flows during the episode, successful episodes received higher annual net inflows (9 percent versus 7½ percent of GDP), with a significant increase in outflows after the episode. Countries with unsuccessful episodes showed a reversal in both portfolio and other flows. The widening of the current account is substantial under both types of episodes; for successful episodes the current account widened by 4 percentage point of GDP to 6 percent of GDP, but less pronounced than in unsuccessful cases. Successful episodes featured higher reserve accumulation during the episode (3 percent GDP annually); and gradual but larger REER appreciation (cumulative of 37 percent including before and after period, versus 26 percent in the unsuccessful episodes).

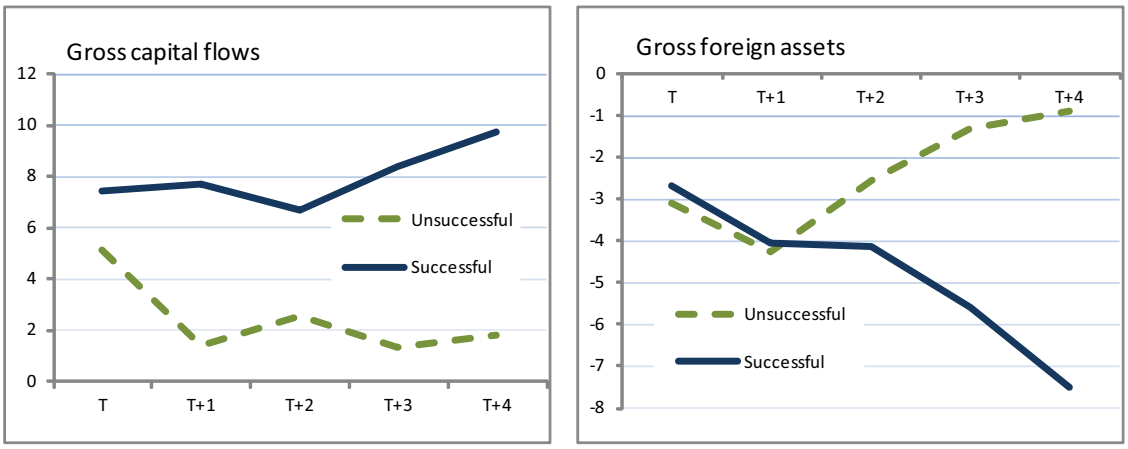
Table 5: External Sector Developments during Episodes of Large Capital Inflows (in percent of GDP, unless specified)

	Unsuccessful			Successful		
	Before	During	After	Before	During	After
Net capital flows	0.7	7.6	-1.1	2.0	9.1	2.1
Gross capital flows	2.9	11.3	2.5	4.1	11.2	10.0
Gross foreign assets (-)	-2.7	-3.8	-3.6	-2.1	-2.2	-7.9
FDI, net	1.8	3.5	2.8	2.0	4.2	1.9
Portfolio flows, net	0.3	0.9	-1.1	0.6	1.5	-1.0
Other flows, net	-1.3	3.2	-2.7	-0.5	3.4	1.3
Portfolio and other flows	-1.1	4.1	-3.9	0.0	4.8	0.2
Current account	1.3	-5.3	0.6	-1.9	-6.2	-2.8
Reserve accumulation (-)	-2.4	-2.0	0.1	-1.7	-3.0	0.2
REER (% change)	2.8	4.2	-3.8	4.4	3.6	1.9

Successful episodes have a smoother adjustment of the real GDP growth once the episode is finished.
1/ Before (after) refers to three years before (after) the episode.
Source: BOPS, WEO.

44. **Countries with successful episodes were able to sustained capital inflows afterwards while the current account adjusted more gradually**. Differences remained between the two categories of episodes after the episode. On the external sector, the most striking differences were reported in sustained gross capital inflows and the sharp increase in gross foreign assets (Figure 2). Unsuccessful episodes ended due to a decline in foreigners purchase of domestic assets (a decline in gross inflows), while successful episodes ended because of an increase of residents' purchase of foreign assets (an increase in gross outflows). The current account adjusted in both cases, but a more gradual process took place for successful episodes; while the real effective exchange rate continued to appreciate (Figure 3). Countries with unsuccessful episodes suffered from higher volatile exchange rate, which depreciated over the medium term. On the fiscal front, the public sector position was stronger under successful episodes, with higher savings and a stronger balance (Figure 4).

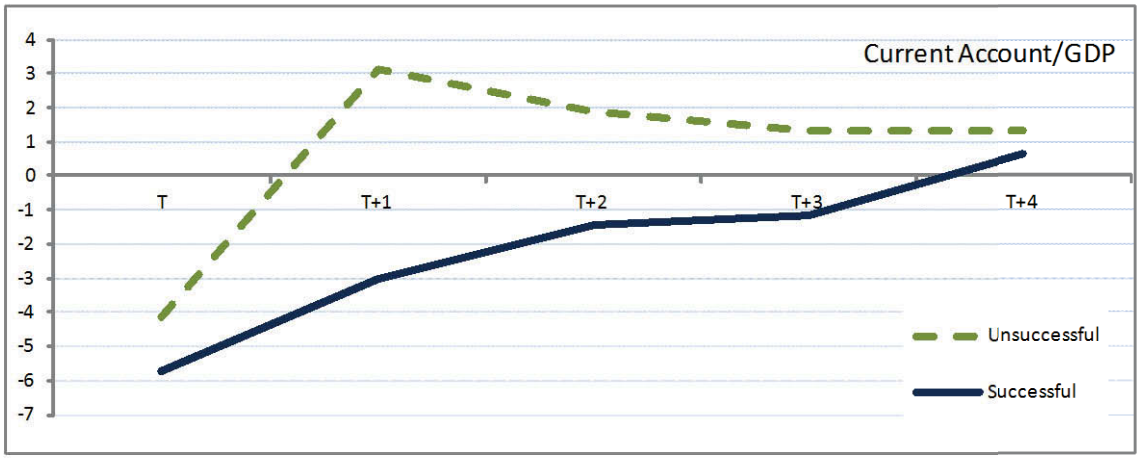
Figure 2: Capital Flows after the Episode

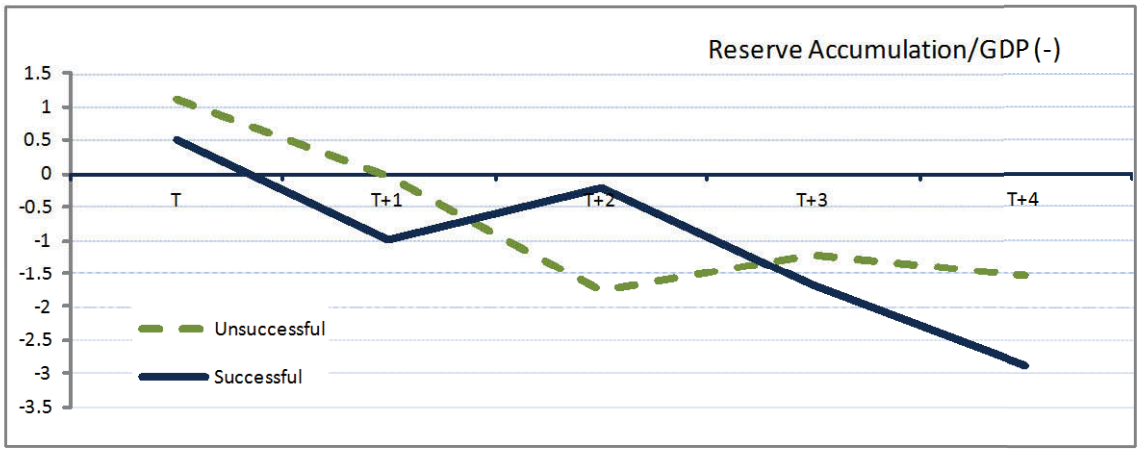


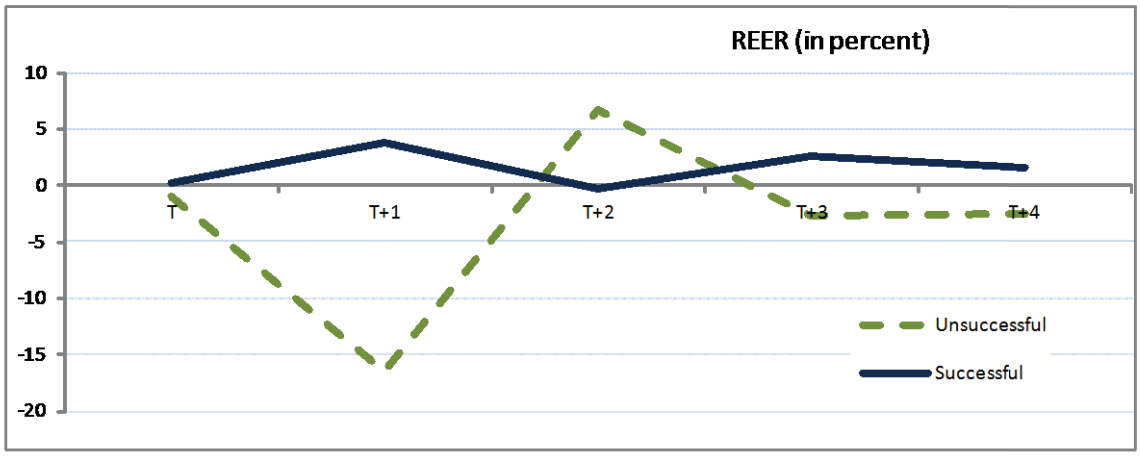
Low (high) growth refers to episodes with a decline in growth after the episode below (above) median.
T refers to the year the episode ends.
Source: BOPS.

Figure 3. Current Account, Reserve Accumulation, and Real Effective Exchange Rate After Episodes

Growth Criteria



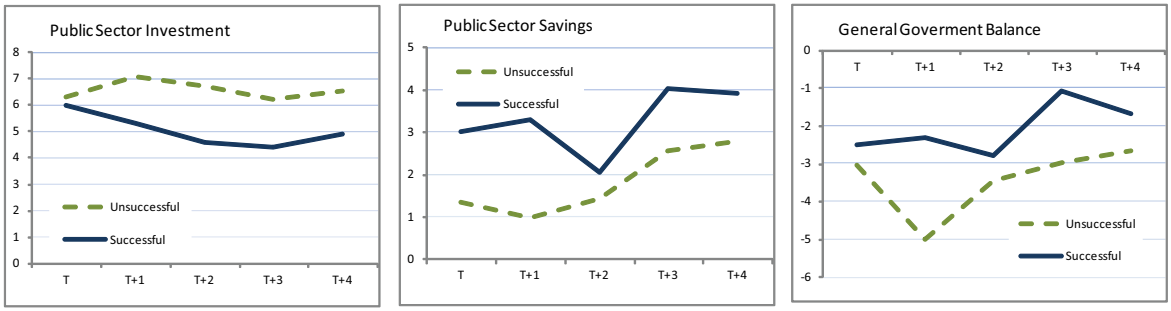




Source: BOPS, WEO.

Low (high) growth refers to episodes with a decline in growth after the episode below (above) median. T refers to the year when the episodes ends.

Figure 4: Fiscal Sector Pattern after the Episode



Source: WEO, and author's calculations.

Differentiating Episodes According to Current Account Adjustment

45. The analysis of successful cases according to current account performance yielded similar results than the classification according to economic performance.

46. Countries with a smoother current account adjustment after the episode continued to receive higher capital inflows afterwards. The median adjustment in the current account was reported at about ¾ percent of GDP, although with significant volatility (the largest adjustment was 14 percent of GDP). For countries with successful episodes, capital inflows (of 12 percent of GDP annually) were partially compensated by higher gross outflows in the period after the episode. Countries with a successful episode depicted a gradual appreciation and higher reserve accumulation. Portfolio and other flows did not reverse afterwards, in contrast with unsuccessful episode where a reversal in net capital flows took place. The reversal translated into a sharp adjustment of the current account (a correction, on average, of 5 percentage points of GDP) (Table A2.1, Appendix 2).

47. Countries with successful episodes depicted higher growth. Under successful episodes, economies depicted higher growth and total domestic demand which was driven primarily by higher private sector investment (Table A2.2, Appendix 2). In line with the previous analysis, public sector savings also increased during the episode, and also afterwards. Unsuccessful episodes resulted in a large growth slowdown after the episode (4 percentage points, to 1½ percent).

IV. Policy Challenges

48. The appropriate policy response to large capital inflows depends on country-specific circumstances, including the type of inflows, the stage of the business cycle, and the fiscal policy position. In principle, any country faced with large capital inflows would like to prevent a build-up in economic imbalances and asset bubbles by assimilating the flows in line with its economic absorption capacity; and prefer FDI inflows to portfolio and banking flows as the former are less volatile and crisis-prone. Policymakers face substantial challenges in dealing with an episode of large capital inflows, especially to prevent overheating and the generation of credit and asset booms.

49. Fiscal policy can be an important tool to attenuate the effects of capital inflows on aggregate demand and the real exchange rate. The successful episodes showed a more countercyclical fiscal policy, allowing greater room for private investment. A more countercyclical fiscal policy would help dampen aggregate demand during the episodes, allow lower interest rates and reduce incentives for portfolio inflows, and alleviate appreciation pressures.

50. Some degree of exchange rate flexibility proved also an important feature of the successful management of capital inflows. Successful episodes depicted gradual appreciation of the real effective exchange rate, which started ahead of the episode and continues afterwards. The risks of postponing an adjustment (not allowing the exchange rate to appreciate during the surge of capital inflows) would provide incentives for further capital inflows. In the case of Peru, consideration needs to be given to the fact that the economy is still highly dollarized, and that spikes in the exchange rate could have balance–sheet effects and hinder the de-dollarization process.[10]

51. Measures may be needed to avoid a build-up of financial risks that could arise from high credit growth. Cross-country experiences show that there are no simple prescriptions, and that policies need to be flexibly designed to fit specific circumstances and perceived risks. Overall, countries have adopted a wide–ranging menu of complementary policies, usually directed at containing the speed of credit growth, stepping-up the surveillance of bank lending practices, enhancing the financial soundness and existing buffers of banks, and improving the credit information environment, including through financial transparency and market discipline.[11]

52. Capital outflows could help offset large gross inflows, reducing the incentives for foreign exchange market intervention and reserve accumulation. A common feature of successful episodes was the sharp increase in outflows in the aftermath of the episode, which seemed to be the driving force of the end of the episodes. To the extent that there may be limitations on other policy measures, facilitating outflows could be considered part of the toolkit.

[10] See accompanying chapter of "Peru: Drivers of De-dollarization" for an analysis of the effects of exchange rate volatility on de-dollarization.

[11] A more detailed discussion is provided in Enoch and Otker-Robe (2007), Hilbers, Otker-Robe, Pazarbasioglu, and Johnsen (2005).

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Appendix 1: Data Sample and Sources

The analysis considers emerging market economies (those included in the Global Developing Statistics, excluding Pakistan) and a number of advanced with an inflation-targeting monetary framework.

Table A1.1: Country Sample

Latin America	Emerging Europe	Emerging Asia	Advanced Countries
Argentina	Bulgaria	China,P.R.: Mainland	Australia
Brazil	Czeq Republic	India	Canada
Chile	Estonia	Indonesia	Finland
Colombia	Hungary	Korea, Republic of	New Zealand
Mexico	Latvia	Malaysia	Norway
Peru	Lithuania	Philippines	Sweden
Venezuela, Rep. Bol.	Poland	Thailand	
	Romania		
	Russian Federation		
	Slovak Republic	**Africa**	
	Slovenia	South Africa	
	Turkey		
	Ukraine		
No. of countries: 34			

Source: Global Development Statistics for Emerging Markets

Annual data on net capital inflows is from balance of payment statistics, and is computed as the sum of net FDI, portfolio, and other flows (reflecting mainly banking flows), and excluding IMF flows. Time series is available for 1980-2008, but episodes under consideration are those starting in the 1990s. The analysis takes into account flows both to the public and to the private sectors, as it is of interest what happens to the economy when receiving long-lasting large capital flows.

Appendix 2: External and Real Sector Developments During Episodes of Large Capital Inflows—Current Account Classification

Table A2.1: External Sector Developments in Emerging Markets during Periods of Large Capital Inflows (in percent of GDP, unless specified)

	Successful			Unsuccessful		
	Before	During	After	Before	During	After
Net capital flows	0.4	8.4	3.9	2.3	7.2	-0.2
Gross capital flows	3.2	12.3	8.7	3.4	8.7	5.7
Gross foreign assets (-)	-3.5	-4.0	-4.8	-1.2	-1.5	-5.8
FDI, net	2.1	3.7	2.5	1.3	2.7	2.3
Portfolio flows, net	0.5	0.7	-1.3	0.4	2.2	-0.9
Other flows, net	-2.2	4.0	2.6	0.5	2.3	-1.7
Portfolio and other flows	-1.7	4.7	1.3	1.0	4.5	-2.5
Current account	1.0	-6.2	-5.1	-1.1	-5.0	0.2
Reserve accumulation (-)	-2.2	-2.6	0.8	-1.6	-2.0	-0.4
REER (% change)	3.3	3.6	2.2	5.4	3.3	-3.1

Successful episodes have a smoother adjustment of the current account once the episode is
1/ Before (after) refers to three years before (after) the episode.
Source: BOPS, WEO.

Table A2.2: Real Sector Developments in Emerging Markets during Periods of Large Capital Inflows (in percent of GDP)

	Successful			Unsuccessful		
	Before	During	After	Before	During	After
Real GDP growth	5.4	6.0	4.3	3.3	4.4	1.4
Public consumption expenditure	16.7	17.7	16.3	11.9	12.9	13.4
Private consumption expenditure	60.8	61.6	56.1	62.4	63.7	62.3
Gross capital formation	20.2	26.6	24.6	21.8	24.8	20.0
Public	4.6	4.5	4.5	3.9	4.9	4.8
Private	15.6	22.1	20.1	17.9	20.0	15.3
Gross national savings	22.1	19.6	24.6	22.2	20.7	21.6
Public	1.0	2.9	5.7	3.8	3.1	1.6
Private	19.6	16.7	18.9	18.5	18.0	20.4
General Government Balance	-2.9	-1.2	-0.7	-2.6	-2.2	-3.5
Central Government Balance	-2.6	-0.9	-0.9	-2.7	-1.9	-3.6
Inflation	16.1	9.5	6.2	17.8	10.5	10.2
Real Total Domestic Demand	96.2	105.9	105.8	97.7	102.6	97.6

Successful episodes have a smoother adjustment of the current account once the episode is
1/ Before (after) refers to three years before (after) the episode.
Source: WEO

Peru: Drivers of De-Dollarization

Peru has successfully pursued a market-driven financial de-dollarization during the last decade. Dollarization of credit and deposit of commercial banks—across all sectors and maturities—have declined, with larger declines for commercial credit and time and saving deposits. The empirical analysis presented in this chapter[1] *confirms that de-dollarization has been driven by macroeconomic stability, introduction of prudential policies to better reflect currency risk, and the development of the capital market in soles. Further de-dollarization efforts could focus on these three fronts. Given the now consolidated macroeconomic stability, greater exchange rate flexibility can induce credit solarization; additional prudential measures could further discourage banks' lending and funding in foreign currency; while further capital market development in domestic currency would help overall financial de-dollarization*.

I. Background

1. Dollarization in Peru started with the inflationary process of the mid-70s and peaked during the hyperinflation of 1988−90, despite efforts to de-dollarize in 1985. With high inflation, the U.S. dollar started to be the preferred means of payments and store of value. Lending institutions also saw that dollars minimize the risk of capital losses. Consequently, financial dollarization rose significantly (Figure 1).[2] In 1985, while inflation was high, the government forced the conversion of foreign currency deposits to local currency, resulting in capital flight and financial disintermediation. When the restriction on foreign currency deposits was lifted, re-dollarization was quick, and by the end-1990s, about 80 percent of deposits (and credit) were denominated in foreign currency.

2. Since the introduction of the inflation targeting (IT) regime in early 2000s, Peru has experienced a gradual and sustained market-driven financial de-dollarization.[3] Dollarization of credit has declined by nearly 25 percentage points during 2001−2009 to below 55 percent by end-2009 (Figure 1). Dollarization of deposits has also declined by a similar amount to about 52 percent.[4]

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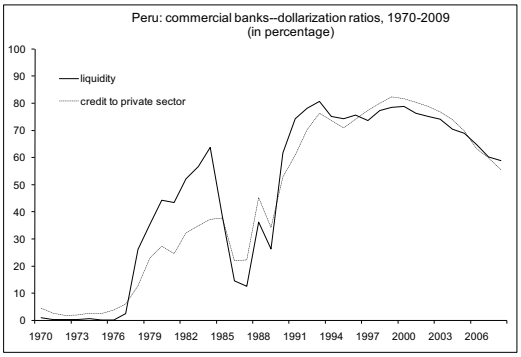
[1] Prepared by Mercedes Garcia-Escribano (WHD). Data for this paper has kindly been provided by the Central Bank of Peru (BCRP) and the Superintendence of Banks (SBS). The author would like to thank Martin Kaufman, Rodrigo Valdés, Alan Ize, Gaston Gelos, and participants at the BCRP and WHD-IMF seminars for their feedback and extensive discussions.

[2] Financial dollarization occurs when a large share of residents' assets and liabilities are denominated in foreign currency. Dollarization ratios in the paper refer to commercial banks, unless noted otherwise.

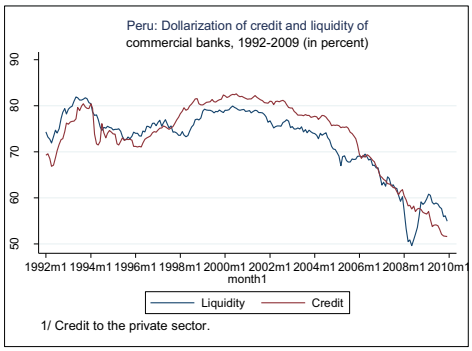
[3] Other countries in Latin America with widespread dollarization have also experienced a process of market-driven de-dollarization during the last decade, including Bolivia, Uruguay and Paraguay.

[4] Transaction dollarization has also declined and is now minimal.

Figure 1. Peru: Evolution of Dollarization for Commercial Banks



Sources: BCRP; and IMF staff calculations.



Sources: BCRP; and IMF staff calculations.

3. While a great deal of work exists on the financial consequences of dollarization, the empirical literature on the process of de-dollarization is scant. While it is widely accepted that hyperinflation is one of the driving factors of financial dollarization when indexed instruments are not readily available, the persistence of high dollarization of deposits and loans after inflation has fallen substantially is still a puzzle. Kokenyne and Veyrune (2008) and Erasmus et al. (2009) highlight that successful attempts to dedollarize have been market-based, combining a track record of macroeconomic stability with other policies to enhance the attractiveness of the local currency.

4. This chapter explores the factors that explain bank de-dollarization in Peru. The contributing role of three groups of factors—macroeconomic stability, prudential regulations and development of the capital market in soles—to the process of banks' de-dollarization is examined. In contrast with the literature that focuses exclusively on dollarization of overall deposits, this chapter examines simultaneously the dollarization of deposits and credits. By estimating deposits and credits simultaneously, banks' response to the different factors that may impact dollarization is taken into consideration. The chapter also examines the drivers of de-dollarization across categories of deposits and credits.

II. De-dollarization—Stylized Facts

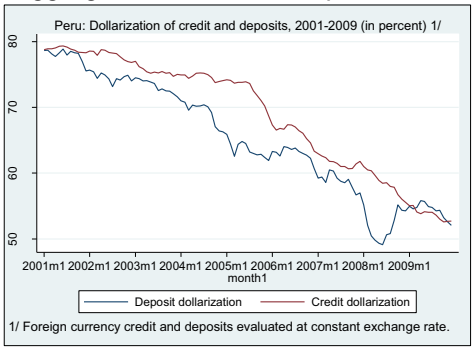
5. De-dollarization has been gradual. Peru has experienced a gradual financial de-dollarization since early 2000s. A sharp deposit de-dollarization took place in late-2007 and that was quickly reversed following the collapse of Lehman Brothers (Figure 2.a.). The return to trend de-dollarization during 2008 resulted from an increase in foreign currency deposits while domestic currency deposits remained stable.

[5] To avoid the impact of valuation changes, deposits and credits in foreign currency are evaluated at a nominal exchange rate of 3 soles/US$.

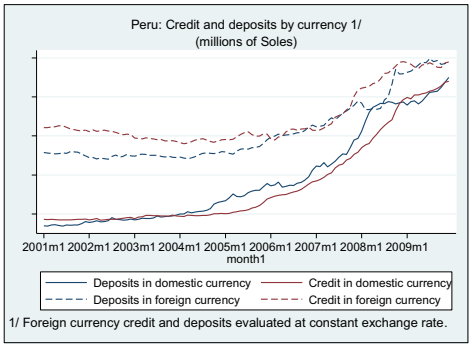
6. Dollarization varies across types of loans and deposits. Dollarization of loans with longer maturities (mortgages and commercial) is higher than loans with shorter maturities (consumer and small businesses) (Figure 2.b.). Dollarization of demand and savings deposits, which are more liquid, is lower than time-deposits (Figure 2.c.).

Figure 2. Peru: De-dollarization of Credit by Sectors and of Deposits by Maturity

a. Aggregated credits and deposits

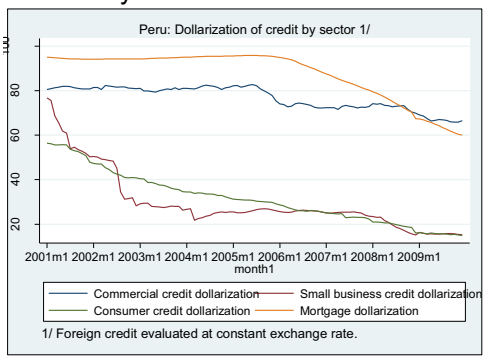


Sources: BCRP; and IMF staff calculations.



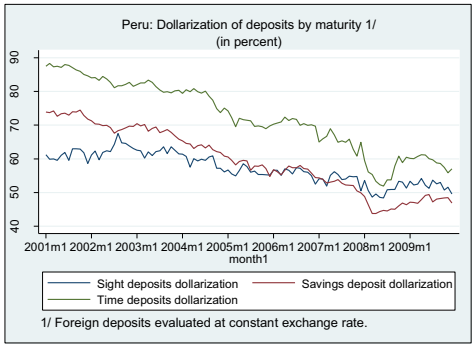
Sources: BCRP; and IMF staff calculations.

b. Credit by sectors



Sources: SBS; and IMF staff calculations.

c. Deposits across maturity loans



Sources: BCRP; and IMF staff calculations.

7. De-dollarization has been driven mainly by changes within each type of credit and deposits.[6] A decomposition of credit de-dollarization through time into within and between

[6] Changes in credit dollarization through time can be decomposed as

$$d_t - d_\tau = \sum_{i=1}^{I} d_{it}\frac{c_{it}}{c_t} - \sum_{i=1}^{I} d_{i\tau}\frac{c_{i\tau}}{c_\tau} = \sum_{i=1}^{I}\left(d_{it} - d_{i\tau}\right)\frac{c_{it}}{c_t} + \sum_{i=1}^{I} d_{i\tau}\left(\frac{c_{it}}{c_t} - \frac{c_{i\tau}}{c_\tau}\right)$$

(continued)

components shows that credit de-dollarization has mostly been driven by within sector de-dollarization (Table 1.a.). The analysis also indicates that commercial sector de-dollarization explains the bulk of total de-dollarization. All commercial sectors—with the exception of fishing, mining, and electricity/water/gas—contributed to the commercial credit de-dollarization process (Annex I). The within and between decomposition for deposit de-dollarization reveals that de-dollarization within maturity explains almost all the decline in deposit dollarization (Table 1.b.).

Table 1. Peru: Decomposition of de-dollarization into a within and between components

a. Credit 1/

	Dollarization		Share in total credit (in percent)		2001-2009		
Sectors	2001	2009	2001	2009	between effect	within effect	total effect
commercial	80.8	66.5	79.0	62.8	-10.7	-11.3	-22.0
small business	50.3	15.3	2.6	6.0	0.5	-0.9	-0.4
consumer	47.8	14.9	9.0	17.5	1.3	-3.0	-1.7
mortgage	94.1	59.9	9.4	13.7	2.5	-3.2	-0.7
total	**78.3**	**53.5**	**100**	**100**	**-6.4**	**-18.4**	**-24.8**

b. Deposits 1/

	Dollarization		Share in total deposits (in percent)		2001-2009		
Maturities	2001	2009	2001	2009	between effect	within effect	total effect
sight	58.7	49.6	19.1	29.5	5.2	-1.7	3.5
saving	71.7	46.9	32.1	27.6	-2.1	-8.0	-10.1
time	84.6	57.1	48.9	42.9	-3.4	-13.4	-16.8
total	**75.5**	**52.1**	**100**	**100**	**-0.3**	**-23.1**	**-23.5**

Sources: BCRP; SBS; and IMF staff calculation.
1/ Credit and deposits in foreign currency are evaluated at a constant nominal exchange rate.

III. Contributing Factors and Measures

Macro pre-conditions—successful implementation of stabilization policies

8. De–dollarization has followed the successful implementation of macroeconomic stabilization policies. Taking advantage of buoyant economic conditions in recent years, public debt has been reduced below 30 percent of GDP, one of the lowest levels in the region (Figure 3). The central bank, under the IT framework introduced in 2002, has successfully contained inflation within the inflation target band and anchored expectations. Moreover, the central bank has built a significant buffer of international reserves, providing a credible assurance of its ability to provide support in case

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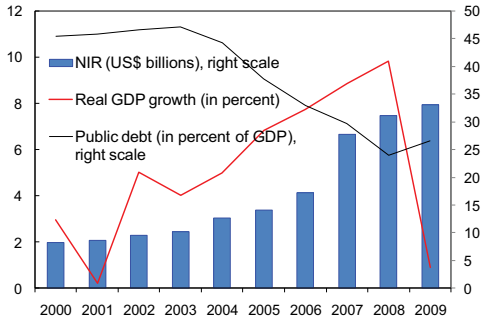
where d_{it} is dollarization of credit in sector i in year t, and c_{it} is the total credit extended to sector i in year t. The first term captures the time-series changes in dollarization within sectors. The second term captures the effect of changes in credit composition. A similar decomposition can be done for deposits.

of stress.[7] Last, thanks to stringent prudential regulations, Peru's financial sector is sound, as shown by its resilience during the recent global financial crisis.

9. Markets have acknowledged Peru's outstanding performance. Peru was granted investment grade by Fitch, Standard & Poor's in April and July 2008, respectively, and by Moody's in December 2009. Peru EMBI stands at about 200 BPS compared to 350 BPS for Latin America as a whole in mid-January 2010.

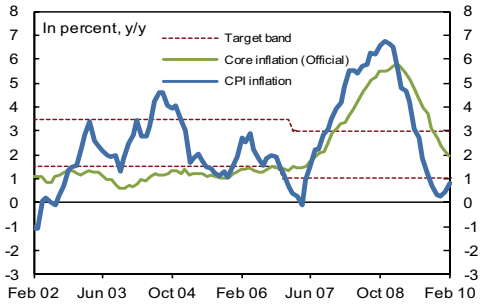
Figure 3. Peru: Macroeconomic Performance, 2000−09

a. GDP growth, NIR and public debt



Sources: BCRP: and IMF staff calculations.

b. Inflation



Sources: BCRP: and IMF staff calculations.

Prudential measures

10. Several prudential measures introduced during the last decade have helped the de-dollarization process by lowering banks' incentives to borrow or lend in foreign currency. These measures include:[8]

- *Reserve requirements (RR).* The difference between the required RR on foreign currency deposits to domestic currency deposits has changed during the period of analysis (Figure 4). The remuneration that the central bank pays on reserves has changed too. Figure 4 illustrates the evolution of the remuneration rate for deposits in either currency above the 6 percent level (which is the current level of non-remunerated reserve requirement applied to all deposits).

[7] Net international reserves increased from US$ 9.6 billion in 2002 to US$ 33.1 billion in 2009.

[8] In addition to the financial prudential measures listed below, the following regulatory measure may have an impact on the demand for local currency. In particular, the Consumer Protection Law was amended in 2004 forcing retailers and wholesalers to list prices in domestic currency. However, the law leaves agents free to list prices also in dollars.

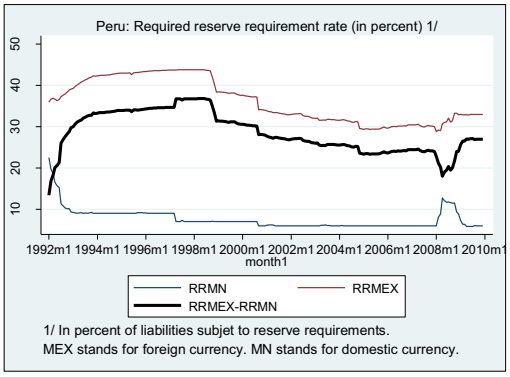
- *Provisioning requirements*. Since mid-2006, banks have to carry out a routine evaluation of currency risks, or alternatively, set up a reserve ranging from 0.25 percent to 1 percent of the credit in foreign currency that has not been evaluated.[9]

11. Additional prudential measures linked to currency exposures are in place, but these have not been modified during the period of analysis. These measures are:

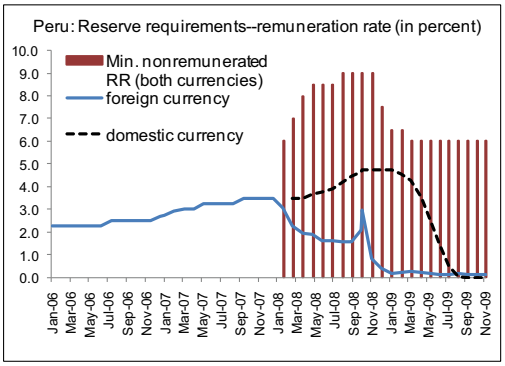
- *Liquidity requirements*. Banks are required to hold liquid assets equivalent to at least 8 percent in domestic currency and 20 percent in foreign currency of all their liabilities maturing during the next 12 months.

- *Banks' net open position*. In addition to limiting banks' foreign currency exposure, there are in Peru capital requirements on open foreign exchange positions. The limit to banks' long (short) open position was changed to 75 (15) percent of capital in February 2010, from a previous limit of 100 (10) percent of capital.[10]

Figure 4. Peru: Reserve Requirements



Sources: BCRP; and IMF staff calculations.



Sources: BCRP; and IMF staff calculations.

Development of a capital financial market in soles

12. Peru has been actively developing its public and private debt market in domestic currency in recent years.

[9] Cayazzo et al. (2006) indicate that only Peru among 17 surveyed countries that are partially dollarized reports requiring higher provisions for foreign currency loans relative to domestic currency ones.

[10] Cayazzo et al (2006) indicate that Poland, Singapore and Sweden have capital charges on foreign exchange exposures. Argentina, Bolivia, Chile, Costa Rica, Honduras and Uruguay have only limits on these exposures. The remaining of the 17 countries surveyed, including Peru, have both capital charges and limits on foreign currency exposures.

- *Domestic public debt market*. In 2003, Peru launched a market-making program with the objective of developing a market for domestic public debt, consisting mainly of fixed-rate instruments in domestic currency.[11,12] In line with this objective, Peru's public debt management strategy has been focused on developing a yield curve of government bonds in soles and reducing the share of public debt denominated in foreign currency (Figure 5.a.). As a result, government bonds in soles have gained liquidity and the yield curve has been extended considerably.[13,14]

- *Private debt market*. Private bond issuances in local currency have also increased substantially in recent years followed an increasing trend (Figure 5.b.).

IV. Understanding De-dollarization

13. Dollarization reflects the choice of currency by depositors, borrowers and banks. Dollarization of credits and deposits reflect the equilibrium in the credit and deposit markets: banks supply loanable funds and demand deposits, and the private sector demands credit and provides funding. Banks, in turn, are active intermediaries between creditors and depositors.

14. A VAR approach allows modeling the dynamics between dollarization of credits and deposits. Such an approach avoids imposing a particular structure to credit and deposit dollarization. It permits to capture (i) the simultaneous determination of credit and deposit dollarization, (ii) the response to exogenous factors that are demand or supply shifters, and (iii) the dynamics of credit and deposit dollarization.

***15.* Two VAR specifications are estimated using monthly data for the period 2001−2009**. The first specification includes dollarization of total credit and total deposits, both in first differences, as endogenous variables. The second includes six endogenous variables, in first differences: dollarization of commercial credit, consumer credit, mortgages, demand deposits, savings deposit, and

[11] Ministerial Resolution 106-2003; Supreme Decree 189-2004; and Supreme Decree 137-2005.

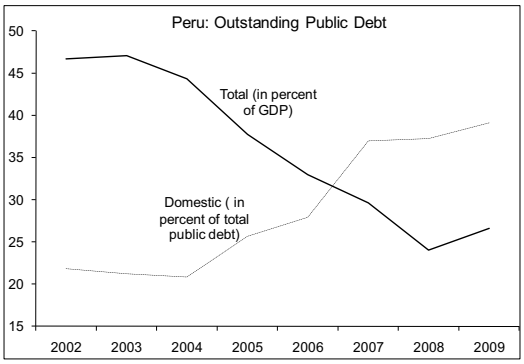
[12] The two types of domestic public bonds (known as Soberanos) are the fixed-coupon "Tasa Fija" bonds and the inflation adjusted, "VAC" bonds. The Tasa Fija bonds are the most liquid instruments and represent nearly 90 percent of Soberanos.

[13] The longest maturity of fixed-rate government paper in domestic currency is 32 years, as of February 2010. It was 5 years in 2003. The VAC curve extends up to 39-year tenors, but has limited liquidity, as the total outstanding amount is US$700 million.

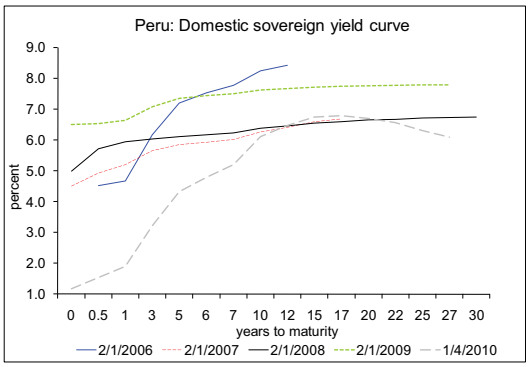
[14] Reflecting the availability of domestic debt instruments in soles, the portfolio of local pension funds (AFPs) denominated in dollars declined to 32 percent in November 2008 from 50 percent in 2000, and has recently increased to 41 percent in December 2009 as the limits on AFP foreign investments have been raised. AFPs hold more than 50 percent of the stock of Soberanos, followed by foreign investors (21 percent), local banks (15 percent), and insurance companies (4 percent).

Figure 5. Peru: Development of Debt Market in Domestic Currency

a. Public debt

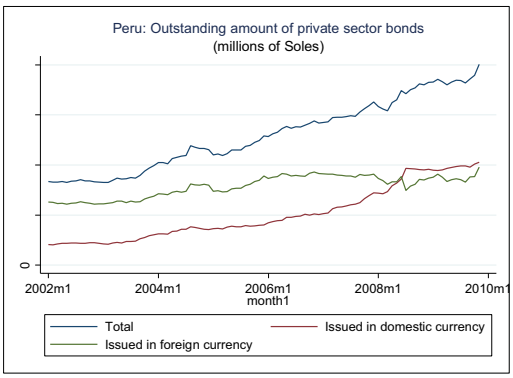


Sources: BCRP; and IMF staff calculations.

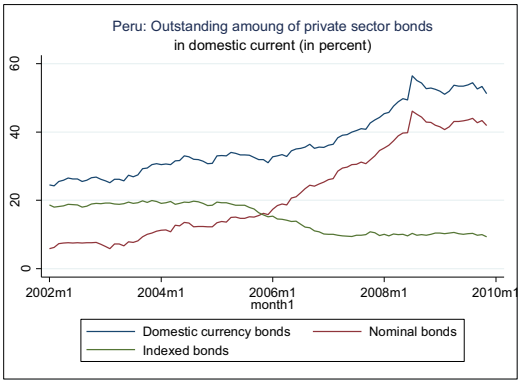


Sources: SBS; and IMF staff calculations.

b. Private sector debt



Sources: BCRP; and IMF staff calculations.



Sources: BCRP; and IMF staff calculations.

time deposits.[15] Both specifications include a set of exogenous variables to proxy macro-stability, changes to prudential measures, and development of the capital market in soles. Table 2 presents the definition of the exogenous variables, and Figure 6 depicts the endogenous and exogenous data series.

16. The estimation results of the aggregate model confirm that the three sets of factors help explain de-dollarization. Table 3 shows the VAR estimation results and Figure 7 depicts, for several

[15] All series are valued at constant nominal exchange rate. The series of total credit and deposit dollarization used for the analysis in this section are constructed using December 2008 weights to avoid composition changes among types of credit and among types of deposits. Cointegration tests were performed in both specifications but rejected. Dollarization series in first-differences are I(0) processes.

of the exogeneous variables, the impact of a unit increase to the exogenous variables on credit and deposit dollarization over time. The findings are:

- Macroeconomic variables. Inflation is not significant suggesting that it is not an important driver of dollarization once inflation and expectations are well-contained—as it has been the case in Peru for the estimation period. Appreciation spikes are important for explaining de-dollarization of credits and deposits. An appreciation spike results in a decline of the dollarization rate of 0.5 percentage points over time (Figure 7). After controlling for sharp exchange rate movements with the appreciation and depreciation dummies, the remaining exchange rate variability further helps to lower dollarization of credit. Under historical volatility of the exchange rate over the last two years, the decline in credit dollarization will be 2.5 percentage points per year. If volatility doubles, the decline in credit dollarization will be instead 5 percentage points per year. The inclusion of EMBI changes in the regression measures the impact of macroeconomic stability not reflected in exchange rate movements. The sign on the EMBI coefficient on deposits is positive as expected, as macroeconomic instability lowers depositors' confidence in the sol.

- Prudential variables. The coefficient on RR spreads has the predicted sign. As RR on dollar deposits increase, credit dollarization declines. The introduction of higher provisions for loans in foreign currency also contributed to credit de-dollarization.

- Market development. Results indicate that as the share of private sector bonds issued in domestic currency increases, dollarization of credit increases too. This could be due to the fact that this variable is capturing instruments competing with bank lending in soles, and as a consequence dollarization of banking credit rises. However, overall credit in soles in the economy increases. The issuance of long-term treasury bonds in soles foster de-dollarization as the development of a sol yield curve helps bank funding and pricing of long-term credit in soles.

17. The VAR specification with disaggregated credit and deposits confirms the findings of the aggregate model and provides further insights on the drivers of de-dollarization. Results are presented in Table 4 and a selection of dynamic multipliers is included in Figure 8.

- Macroeconomic variables. Consistent with the aggregate model, exchange rate spikes matter for de-dollarization. Appreciation spikes foster de-dollarization of commercial credit, while depreciation spikes are associated with higher dollarization of mortgages. Once we control for sharp exchange rate movements, volatility of the exchange rate lowers dollarization of commercial credit—the coefficient is sizable and highly significant. Inflation seems to promote dollarization of time-deposits.

- Prudential variables. Higher RR spreads lower dollarization, specifically, for commercial credit. The introduction of higher provisions for foreign currency loans helped lower dollarization of credit—particularly mortgages.[16]

- Market development. As found in the aggregate model, the increase in the share of bonds issued in soles raises dollarization of credit, in particular, of credit extended to the commercial sector, which supports the explanation that some of the private debt instruments issued in soles compete with banks loans in soles. The issuance of long-term treasury bonds in soles, promotes de-dollarization of credit. The coefficients on treasury bonds with terms of 10−15 years and 15−20 years are significant for commercial credit.

V. Next Steps

18. To consolidate and deepen the de-dollarization process in Peru, a range of measures could play a role.

- Macro-economic related. The IT framework has been key to keep inflation expectations well anchored, which are essential to the de-dollarization process. Moreover, the successful policy response during the global financial crisis has further increased currency credibility. In this context, some further exchange rate flexibility could foster the de-dollarization process.

- Prudential measures. Regulatory measures can also promote funding and lending in domestic currency. Provisions and capital requirements for foreign currency lending to un-hedged domestic borrowers could be periodically reassessed to ensure that the foreign exchange credit risk remains well internalized. The development of mortgage covered bonds in soles, which is being promoted by the authorities, will help banks to finance mortgages in soles.

- Development of a capital market in soles. Deepening long-term funding and pricing in Soles will enhance de-dollarization, which would be supported by improving further the Soberanos yield curve, and developing the repo market and the fixed-floating swap curve. Fostering the development of long-term Sol instruments indexed to the CPI could promote de-dollarization through the solarization of pensions.

[16] The discontinuation of the provision of credit risk guarantees by *MiVivienda* (a government-sponsored housing program) for new mortgages denominated in foreign currency extended by financial institutions took place in January 2008. Therefore, this change in *MiVivienda* is not driving the results.

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Table 2. Definition of Exogenous Variables

Macro-stability variables	
$inflation_t$	Sum over *t* and *t-1* of the monthly percentage change of the CPI.
$d_t^{depreciation}$	Dummy equal to 1 if depreciation in *t* and *t-1* exceeds 1 percent; zero, otherwise.
$d_t^{appreciation}$	Dummy equal to 1 if appreciation in *t*, and *t-1* exceeds 1 percent; zero, otherwise.
e_t	Sum over *t* and *t-1* of the monthly percentage change of the nominal exchange rate.
s_t	Standard deviation of daily percentage change of the nominal exchange rate over 90-days
$\Delta embi_t$	First-difference of the EMBI Peru, divided by 100.
Prudential variables	
$\Delta\ RR_t$	Difference over *t* and *t-2* of the spread between the required RR rate in foreign currency to the rate in domestic currency (in percent).
d_t^{2006}	Dummy equal to 1 starting in mid-2006 till mid-2007 to reflect the introduction of more provisions for foreign currency loans, if currency risk not assessed; zero, otherwise.
Soles capital market variables	
Δ share bonds in soles	First difference of the percentage of the stock of private sector bonds denominated in local currency.
$d_t^{10–15}$	Dummy equal to 1 if during that month a treasury bond maturing in 10 up to 15 years was issued; zero, otherwise.
$d_t^{15–20}$	Dummy equal to 1 if during that month a treasury bond maturing in 15 up to 20 years was issued; zero, otherwise.
d_t^{20}	Dummy equal to 1 if during that month a treasury bond maturing in 20 or more years; zero, otherwise.

The exogenous variables are I(0) processes.

Table 3. Results of Aggregate VAR Model

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Δdol^{credit}_{t}	$\Delta dol^{deposit}_{t}$	Δdol^{credit}_{t}	$\Delta dol^{deposit}_{t}$	Δdol^{credit}_{t}	$\Delta dol^{deposit}_{t}$	Δdol^{credit}_{t}	$\Delta dol^{deposit}_{t}$
$\Delta dol^{credit}_{t-1}$	0.16*	-0.42**	0.12	-0.34	0.08	-0.34	0.02	-0.42*
	(0.10)	(0.20)	(0.10)	(0.21)	(0.10)	(0.22)	(0.10)	(0.23)
$\Delta dol^{credit}_{t-2}$	0.14	0.10	0.13	0.12	0.12	0.09	0.09	0.08
	(0.10)	(0.20)	(0.10)	(0.20)	(0.10)	(0.21)	(0.10)	(0.22)
$\Delta dol^{deposit}_{t-1}$	0.05	0.03	0.06	-0.02	0.08	-0.01	0.09*	0.01
	(0.05)	(0.09)	(0.05)	(0.10)	(0.05)	(0.11)	(0.05)	(0.11)
$\Delta dol^{deposit}_{t-2}$	-0.08**	-0.07	-0.07	-0.12	-0.02	-0.13	-0.03	-0.13
	(0.04)	(0.09)	(0.05)	(0.10)	(0.05)	(0.10)	(0.05)	(0.11)
macrostability								
inflationt	-0.01	0.13	-0.04	0.17	-0.09	0.20	-0.09	0.22
	(0.07)	(0.14)	(0.07)	(0.14)	(0.08)	(0.17)	(0.08)	(0.17)
$d_t^{appreciation}$	-0.41**	-0.59*	-0.43***	-0.59*	-0.45***	-0.57	-0.45***	-0.72*
	(0.16)	(0.34)	(0.16)	(0.34)	(0.17)	(0.36)	(0.17)	(0.38)
$d_t^{depreciation}$	0.27	0.49	0.25	0.56	0.32	0.51	0.27	0.41
	(0.19)	(0.40)	(0.19)	(0.40)	(0.21)	(0.44)	(0.21)	(0.46)
e_t	-0.09***	0.05	-0.08**	0.02	-0.09**	0.01	-0.08**	0.01
	(0.03)	(0.06)	(0.03)	(0.07)	(0.03)	(0.07)	(0.04)	(0.08)
s_t	-0.43	0.47	-0.47*	0.45	-0.54*	0.36	-0.49*	0.34
	(0.27)	(0.56)	(0.27)	(0.56)	(0.28)	(0.60)	(0.28)	(0.62)
Δembi	0.00	0.07	0.01	0.07	-0.01	0.10	0.00	0.15
	(0.09)	(0.18)	(0.09)	(0.18)	(0.09)	(0.20)	(0.09)	(0.20)
prudential								
ΔRR_t			-0.06	0.17	-0.10	0.17	-0.10	0.14
			(0.07)	(0.14)	(0.07)	(0.14)	(0.07)	(0.15)
d^{2006}			-0.20	0.05	-0.23*	0.07	-0.24	0.21
			(0.13)	(0.26)	(0.13)	(0.28)	(0.17)	(0.37)
capital market development								
Δ share bonds in soles					0.07*	-0.01	0.06	-0.03
					(0.04)	(0.09)	(0.04)	(0.09)
$d^{10\text{-}15}$							-0.31**	-0.25
							(0.13)	(0.28)
$d^{15\text{-}20}$							-0.01	-0.17
							(0.15)	(0.33)
d^{20}							-0.13	0.18
							(0.15)	(0.34)
Constant	-0.07	-0.42***	-0.02	-0.45***	0.00	-0.46***	0.03	-0.43**
	(0.07)	(0.15)	(0.07)	(0.15)	(0.08)	(0.17)	(0.08)	(0.18)
Observations	105	105	105	105	94	94	94	94
R-squared	0.27	0.21	0.39	0.83	0.40	0.85	0.39	0.86

Sources: IMF staff calculations.
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4. Results of Six Variable VAR Specification

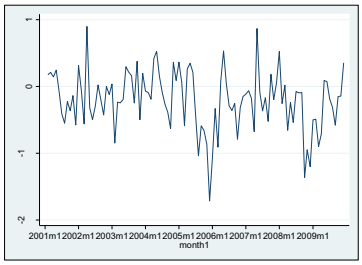
	(1) $\Delta dol^{commercial}_{t}$	(2) $\Delta dol^{consumption}_{t}$	(3) $\Delta dol^{mortgage}_{t}$	(4) Δdol^{vista}_{t}	(5) Δdol^{saving}_{t}	(6) Δdol^{time}_{t}
$\Delta dol^{commercial}_{t-1}$	-0.03	0.02	-0.04	-0.07	-0.2	-0.43
	(0.10)	(0.08)	(0.05)	(0.26)	(0.16)	(0.27)
$\Delta dol^{commercial}_{t-2}$	0.07	0.19***	0.07	-0.09	-0.01	0.12
	(0.09)	(0.07)	(0.05)	(0.23)	(0.14)	(0.24)
$\Delta dol^{consumption}_{t-1}$	0.35**	-0.1	-0.1	-0.2	0.19	0.03
	(0.14)	(0.11)	(0.07)	(0.35)	(0.22)	(0.37)
$\Delta dol^{consumption}_{t-2}$	-0.19	0.14	-0.04	-0.19	0.21	-0.02
	(0.12)	(0.09)	(0.06)	(0.29)	(0.18)	(0.30)
$\Delta dol^{mortgage}_{t-1}$	-0.34*	-0.12	0.16*	-0.84*	-0.28	0.01
	(0.18)	(0.13)	(0.09)	(0.45)	(0.28)	(0.47)
$\Delta dol^{mortgage}_{t-2}$	-0.12	0.17	0.41***	0.76*	0.34	0.67
	(0.18)	(0.14)	(0.09)	(0.46)	(0.28)	(0.48)
Δdol^{vista}_{t-1}	-0.03	-0.02	-0.01	-0.53***	0.13**	0.07
	(0.04)	(0.03)	(0.02)	(0.10)	(0.06)	(0.10)
Δdol^{vista}_{t-2}	-0.02	-0.13***	-0.04**	-0.28***	0.03	-0.05
	(0.04)	(0.03)	(0.02)	(0.10)	(0.06)	(0.10)
$\Delta dol^{saving}_{t-1}$	0.28***	0.04	0.03	0.09	-0.32***	0.31
	(0.07)	(0.06)	(0.04)	(0.18)	(0.11)	(0.19)
$\Delta dol^{saving}_{t-2}$	-0.04	0.02	0	-0.27*	-0.17*	0.26
	(0.06)	(0.05)	(0.03)	(0.16)	(0.10)	(0.16)
Δdol^{time}_{t-1}	0.05	0	0.03	0.30***	0.21***	-0.25**
	(0.04)	(0.03)	(0.02)	(0.10)	(0.06)	(0.10)
Δdol^{time}_{t-2}	0.01	-0.04	-0.03	0.23**	0.08	-0.23**
	(0.04)	(0.03)	(0.02)	(0.11)	(0.06)	(0.11)
macrostability						
inflationt	-0.10	-0.07	-0.07	-0.40	-0.17	0.93***
	(0.11)	(0.08)	(0.06)	(0.28)	(0.17)	(0.29)
$d_t^{appreciation}$	-0.62**	0.20	0.02	-0.22	-0.31	-1.04
	(0.25)	(0.18)	(0.12)	(0.62)	(0.38)	(0.64)
$d_t^{depreciation}$	0.23	0.31	0.37**	0.65	0.64	0.95
	(0.31)	(0.23)	(0.16)	(0.78)	(0.47)	(0.80)
et	-0.11**	-0.01	0.02	0.08	-0.01	-0.01
	(0.05)	(0.04)	(0.03)	(0.13)	(0.08)	(0.13)
st	-1.24***	-0.12	-1.03***	-1.66	0.92	0.64
	(0.45)	(0.33)	(0.23)	(1.13)	(0.69)	(1.17)
Δembi	0.23*	-0.16*	-0.18***	0.79**	-0.39**	0.16
	(0.13)	(0.10)	(0.06)	(0.32)	(0.20)	(0.33)
prudential						
ΔRRt	-0.28***	0.1	0	-0.01	0.14	0.28
	(0.10)	(0.07)	(0.05)	(0.25)	(0.15)	(0.26)
d2006t	-0.31	-0.1	-0.23*	-0.71	-0.27	1.10*
	(0.25)	(0.18)	(0.13)	(0.62)	(0.38)	(0.65)
capital market development						
Δ share bonds in soles	0.15***	-0.05	0	0.13	-0.02	-0.08
	(0.06)	(0.04)	(0.03)	(0.15)	(0.09)	(0.15)
d^{10-15}	-0.53***	0.2	0.04	-0.21	-0.61**	-0.1
	(0.18)	(0.13)	(0.09)	(0.44)	(0.27)	(0.46)
d^{15-20}	-0.38*	0.37**	-0.11	0.53	0.22	-0.42
	(0.23)	(0.17)	(0.11)	(0.57)	(0.35)	(0.59)
d^{20}	-0.36	0.19	-0.08	0.79	0.11	0.4
	(0.23)	(0.17)	(0.11)	(0.56)	(0.34)	(0.59)
Constant	0.31**	-0.36***	0.08	0.22	-0.25	-0.69*
	(0.15)	(0.11)	(0.07)	(0.37)	(0.23)	(0.39)
Observations	94	94	94	94	94	94
R-squared	0.48	0.37	0.75	0.42	0.41	0.31

Sources: IMF staff calculations.
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

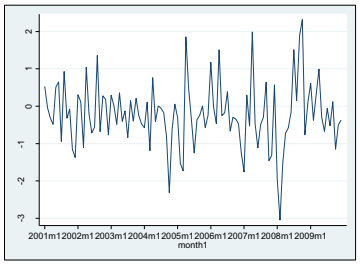
Figure 6. Data for the Empirical Analysis

Endogenous variables

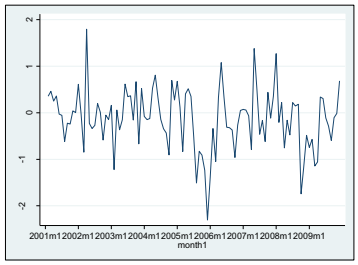
Δ dollarization of credit



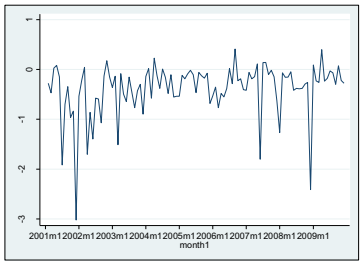
Δ dollarization of deposits



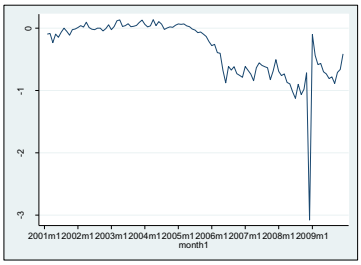
Δ dollarization commercial credit



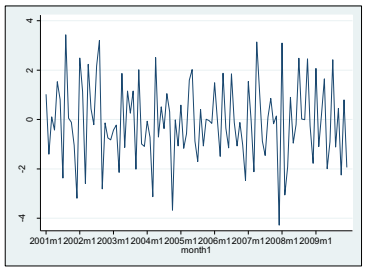
Δ dollarization consumer credit



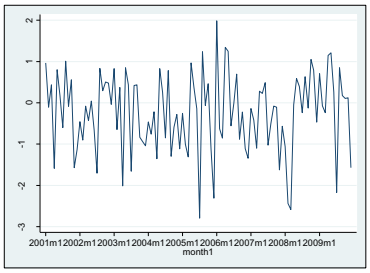
Δ dollarization mortgage



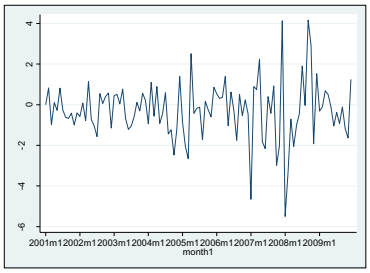
Δ dollarization deposit vista



Δ dollarization deposit ahorro

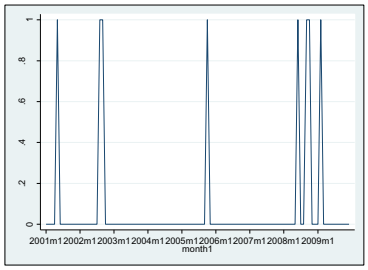


Δ dollarization deposit plazo

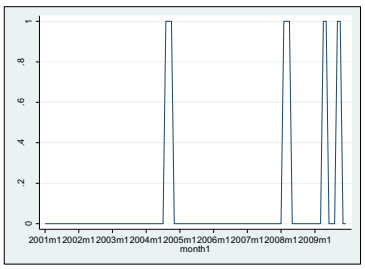


Exogenous variables

$d_t^{depreciation}$



$d_t^{appreciation}$



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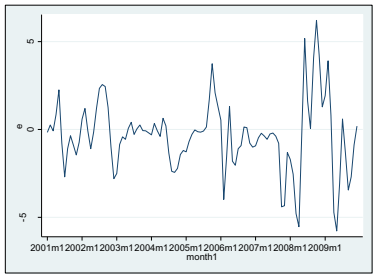

Source: IMF staff calculations.

Figure 6. Data for the Empirical Analysis. (cont.)

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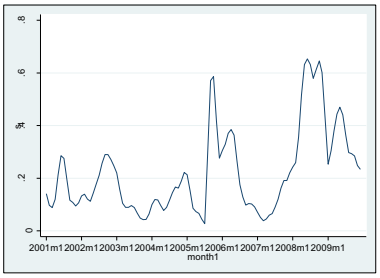
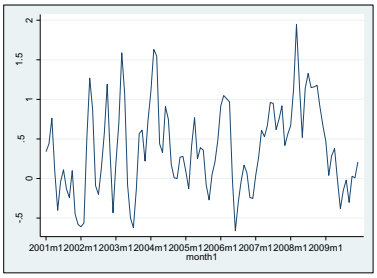
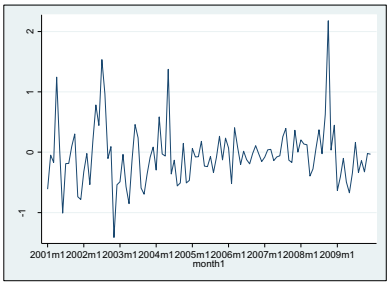


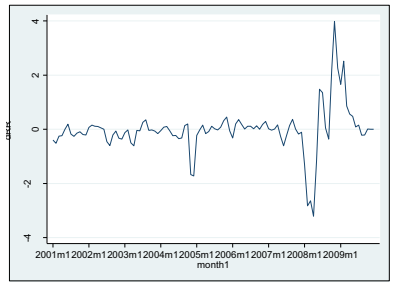
inflation



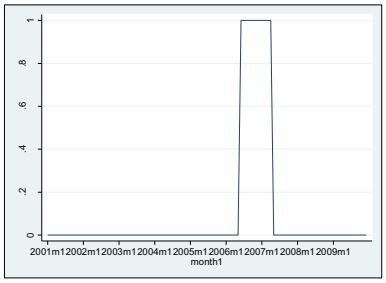
Δembi



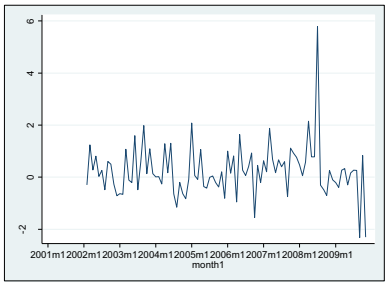
Δ RR



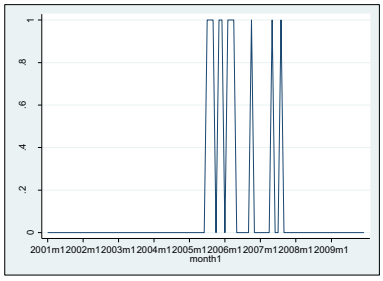
d_t^{pruden}



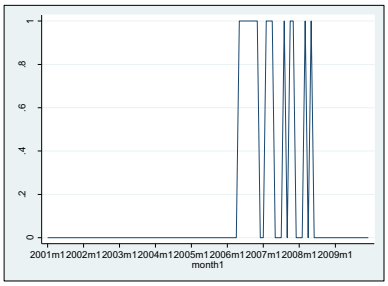
Δ share bonds in sol



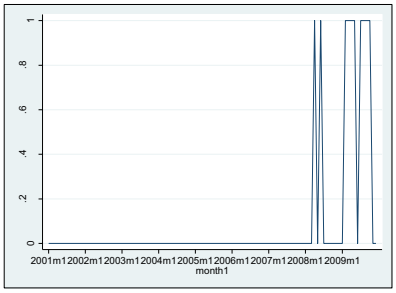
$d_t^{10–15}$



$d_t^{15–20}$



d_t^{20}

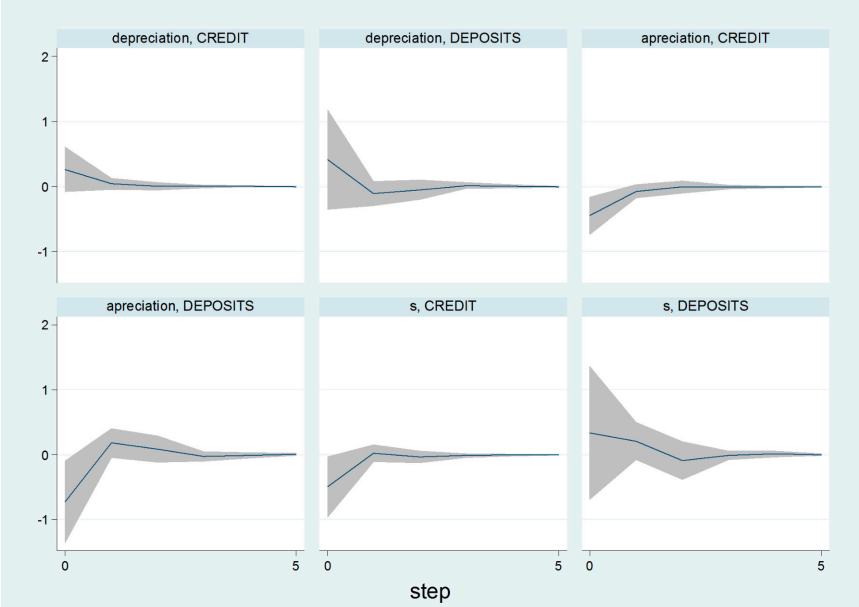


Source: IMF staff calculations.

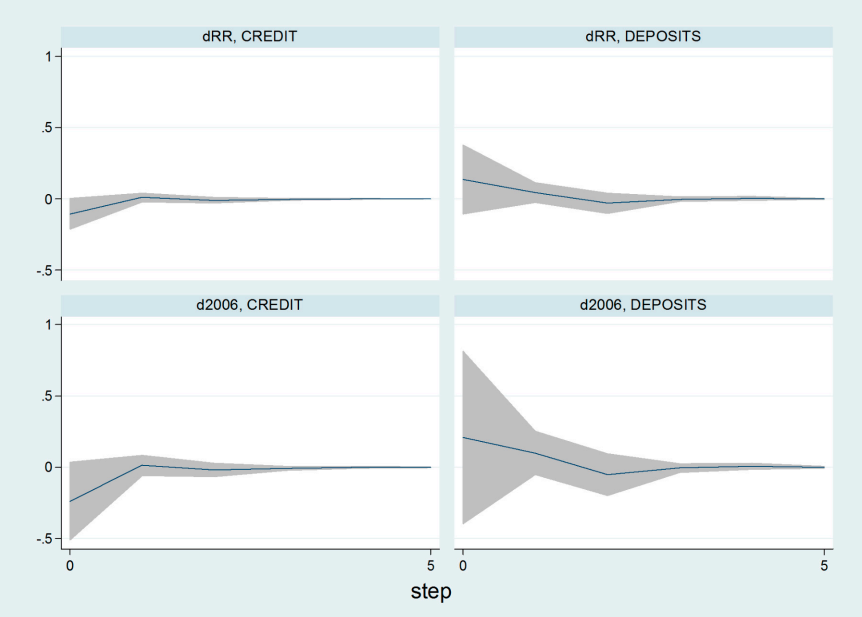
Figure 7. Aggregate Model: Dynamic Impact of Selective Exogenous Variables

a. Dynamic Multipliers

Exchange rate variables



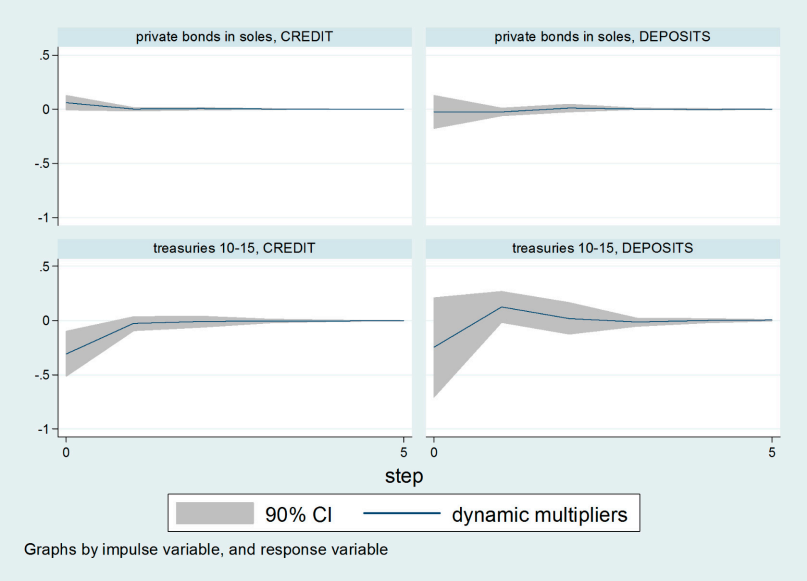
Prudential variables



Source: IMF staff calculations.

Figure 7. Aggregate Model: Dynamic Impact of Selective Exogenous Variables (cont.)

Capital market development variables



b. Cumulative dynamic multipliers

Cumulative dynamic multipliers							
		Δdolcredit t			Δdoldeposit t		
		confidence intervals			confidence intervals		
	steps	cdm	Lower	Upper	cdm	Lower	Upper
inflation	0	-0.09	-0.22	0.03	0.22	-0.06	0.49
	5	-0.09	-0.23	0.05	0.22	-0.02	0.46
dappreciation	0	-0.45	-0.73	-0.16	-0.72	-1.35	-0.09
	5	-0.54	-0.88	-0.19	-0.49	-1.08	0.11
ddepreciation	0	0.27	-0.08	0.61	0.41	-0.35	1.17
	5	0.32	-0.08	0.71	0.28	-0.40	0.96
s	0	-0.49	-0.96	-0.03	0.34	-0.68	1.36
	5	-0.52	-1.00	-0.04	0.46	-0.37	1.28
e	0	-0.08	-0.14	-0.03	0.01	-0.12	0.14
	5	-0.09	-0.16	-0.02	0.04	-0.09	0.16
Δembi	0	0.00	-0.15	0.15	0.15	-0.18	0.48
	5	0.01	-0.16	0.18	0.13	-0.16	0.43
ΔRRt	0	-0.10	-0.21	0.01	0.14	-0.11	0.38
	5	-0.11	-0.21	0.00	0.15	-0.03	0.34
d2006	0	-0.24	-0.51	0.04	0.21	-0.40	0.81
	5	-0.25	-0.56	0.06	0.26	-0.27	0.80
Δ share bonds in soles	0	0.06	-0.01	0.13	-0.03	-0.18	0.12
	5	0.06	-0.01	0.14	-0.04	-0.17	0.09
d10-15	0	-0.31	-0.52	-0.10	-0.25	-0.71	0.21
	5	-0.35	-0.58	-0.13	-0.12	-0.50	0.27
d15-20	0	-0.01	-0.26	0.24	-0.17	-0.71	0.38
	5	-0.02	-0.30	0.25	-0.14	-0.62	0.33
d20	0	-0.13	-0.38	0.12	0.18	-0.37	0.74
	5	-0.13	-0.43	0.16	0.20	-0.30	0.70

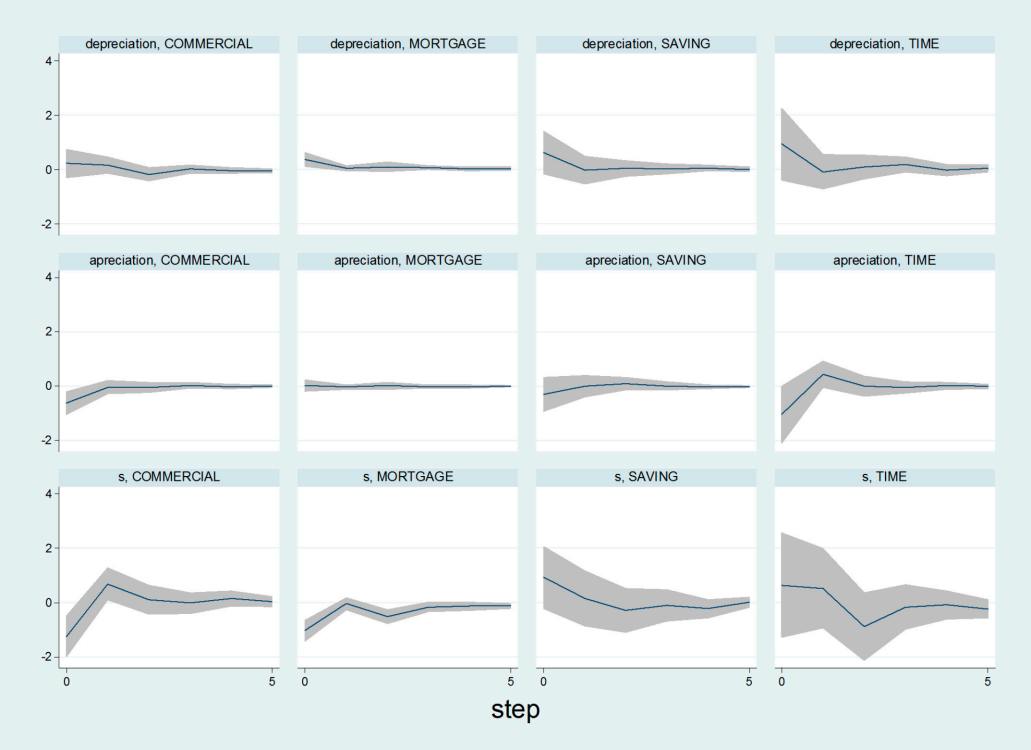
1/ 90 percent confidence interval. Highlighted if statistically significant different from zero.

Source: IMF staff calculations.

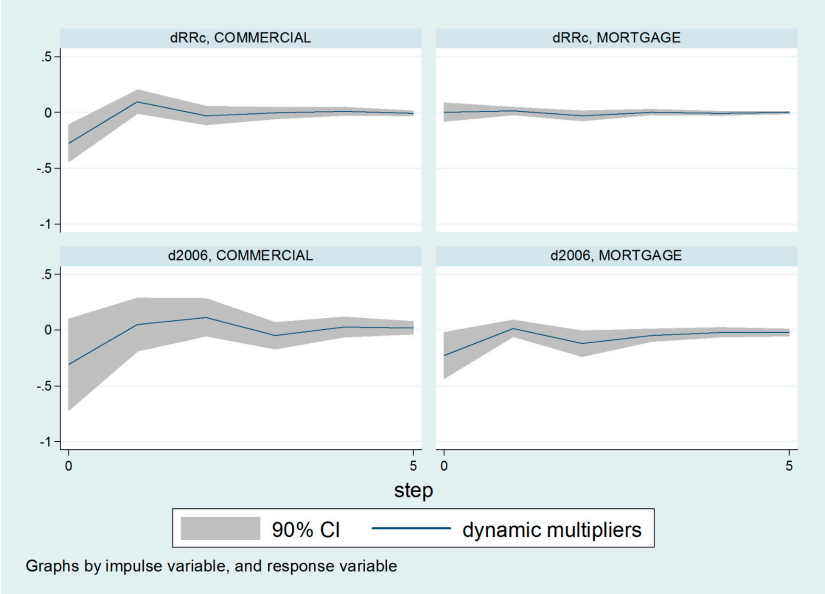
Figure 8. Six-Variable Model: Dynamic Impact of Selective Exogenous Variables

a. Dynamic multipliers

Exchange rate variables



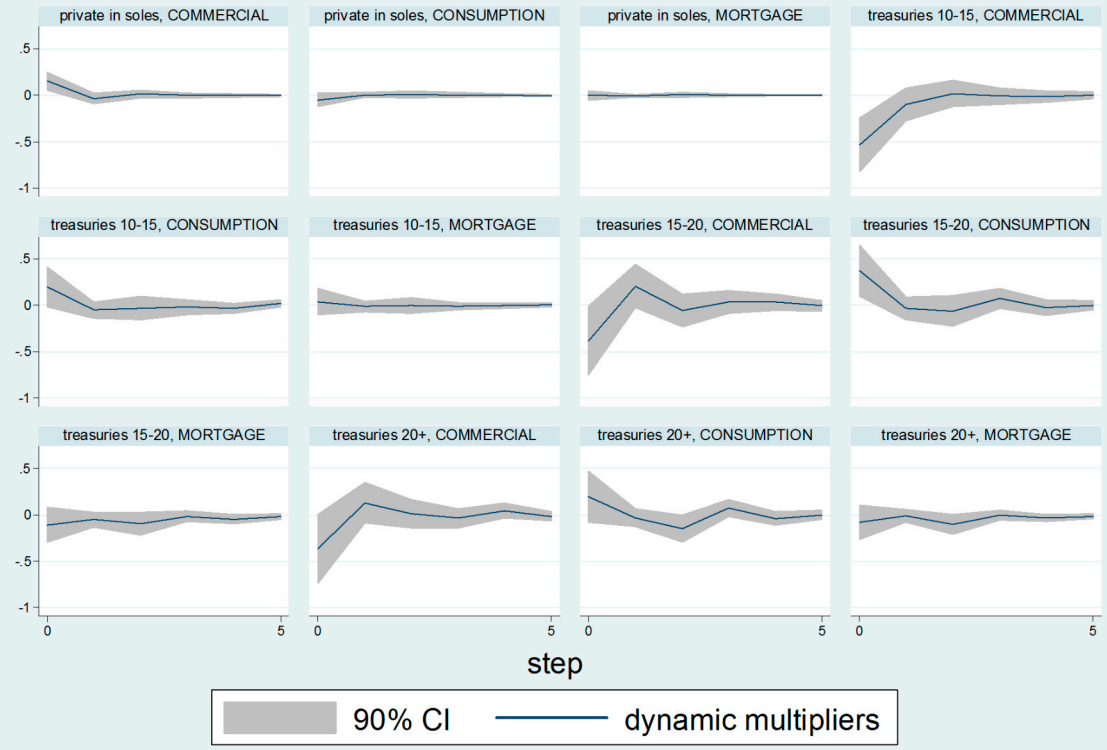
Prudential variables



Source: IMF staff calculations.

Figure 8. Six-Variable Model: Dynamic Impact of Selective Exogenous Variables (cont.)

Capital market development variables



Source: IMF staff calculations.

Figure 8. Six-Variable Model: Dynamic Impact of Selective Exogenous Variables (cont.)

b. Cumulative dynamic multipliers

Cummulative dynamic multipliers

		Δdolcommercial t			$\Delta dol^{consumption}_t$			$\Delta dol^{mortgage}_t$		
		confidence intervals			confidence intervals			confidence intervals		
exogenous variables	steps	cdm	Lower	Upper	cdm	Lower	Upper	cdm	Lower	Upper
inflation	0	-0.10	-0.29	0.08	-0.07	-0.20	0.07	-0.07	-0.16	0.02
	5	-0.05	-0.27	0.17	-0.11	-0.26	0.05	-0.11	-0.29	0.07
$d_t^{appreciation}$	0	-0.62	-1.03	-0.22	0.20	-0.10	0.50	0.02	-0.18	0.23
	5	-0.71	-1.22	-0.19	0.12	-0.25	0.48	-0.02	-0.44	0.40
$d_t^{depreciation}$	0	0.23	-0.28	0.74	0.31	-0.06	0.69	0.37	0.12	0.63
	5	0.21	-0.46	0.88	0.34	-0.13	0.82	0.70	0.16	1.24
s	0	-1.24	-1.99	-0.50	-0.12	-0.67	0.43	-1.03	-1.40	-0.66
	5	-0.28	-1.07	0.50	-0.19	-0.75	0.36	-2.00	-2.63	-1.38
e	0	-0.11	-0.19	-0.02	-0.01	-0.07	0.05	0.02	-0.03	0.06
	5	-0.13	-0.24	-0.03	-0.05	-0.12	0.03	0.03	-0.06	0.12
Δembi	0	0.23	0.01	0.44	-0.16	-0.31	0.00	-0.18	-0.29	-0.08
	5	0.24	-0.03	0.52	-0.22	-0.42	-0.03	-0.38	-0.60	-0.16
ΔRRt	0	-0.28	-0.44	-0.11	0.10	-0.02	0.23	0.00	-0.08	0.08
	5	-0.21	-0.36	-0.06	0.05	-0.06	0.16	-0.02	-0.15	0.11
d2006t	0	-0.31	-0.72	0.10	-0.10	-0.40	0.20	-0.23	-0.43	-0.02
	5	-0.15	-0.62	0.33	-0.17	-0.51	0.17	-0.43	-0.82	-0.03
Δ share bonds in soles	0	0.15	0.06	0.25	-0.05	-0.12	0.02	0.00	-0.05	0.05
	5	0.13	0.02	0.24	-0.03	-0.11	0.05	0.01	-0.08	0.10
d10-15	0	-0.53	-0.82	-0.24	0.20	-0.02	0.41	0.04	-0.11	0.18
	5	-0.63	-0.95	-0.30	0.08	-0.15	0.31	0.00	-0.26	0.27
d15-20	0	-0.38	-0.76	-0.01	0.37	0.10	0.65	-0.11	-0.30	0.08
	5	-0.18	-0.62	0.27	0.32	0.01	0.64	-0.33	-0.70	0.04
d20	0	-0.36	-0.74	0.01	0.19	-0.08	0.47	-0.08	-0.27	0.11
	5	-0.22	-0.67	0.23	0.05	-0.27	0.38	-0.24	-0.62	0.13

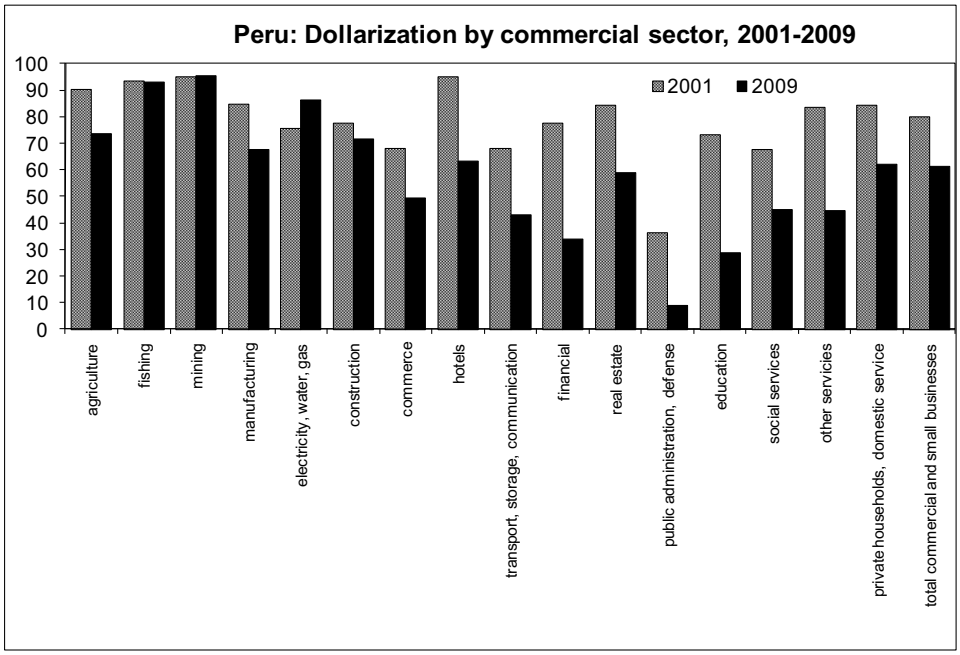
		Δdol^{vista}_t			Δdol^{saving}_t			Δdol^{time}_t		
		confidence intervals			confidence intervals			confidence intervals		
exogenous variables	steps	cdm	Lower	Upper	cdm	Lower	Upper	cdm	Lower	Upper
inflation	0	-0.40	-0.85	0.06	-0.17	-0.44	0.11	0.93	0.46	1.39
	5	0.03	-0.28	0.33	-0.02	-0.26	0.21	0.57	0.20	0.94
$d_t^{appreciation}$	0	-0.22	-1.23	0.79	-0.31	-0.92	0.31	-1.04	-2.09	0.01
	5	-0.25	-0.95	0.45	-0.23	-0.77	0.31	-0.65	-1.51	0.22
$d_t^{depreciation}$	0	0.65	-0.63	1.92	0.64	-0.14	1.42	0.95	-0.37	2.27
	5	0.52	-0.42	1.45	0.79	0.08	1.50	1.20	0.05	2.34
s	0	-1.66	-3.51	0.19	0.92	-0.21	2.05	0.64	-1.28	2.56
	5	-0.82	-1.93	0.30	0.47	-0.38	1.31	-0.21	-1.57	1.15
e	0	0.08	-0.13	0.29	-0.01	-0.14	0.12	-0.01	-0.23	0.20
	5	0.08	-0.07	0.23	0.02	-0.10	0.13	0.03	-0.15	0.22
Δembi	0	0.79	0.26	1.31	-0.39	-0.71	-0.07	0.16	-0.39	0.70
	5	0.47	0.09	0.85	-0.35	-0.65	-0.06	-0.26	-0.74	0.21
ΔRRt	0	-0.01	-0.42	0.40	0.14	-0.11	0.39	0.28	-0.14	0.71
	5	0.09	-0.12	0.31	0.21	0.04	0.37	0.30	0.04	0.55
d2006t	0	-0.71	-1.74	0.31	-0.27	-0.89	0.36	1.10	0.04	2.16
	5	-0.09	-0.74	0.56	-0.12	-0.62	0.38	0.53	-0.27	1.32
Δ share bonds in soles	0	0.13	-0.11	0.37	-0.02	-0.16	0.13	-0.08	-0.33	0.17
	5	0.04	-0.12	0.19	-0.05	-0.17	0.07	-0.10	-0.29	0.09
d10-15	0	-0.21	-0.93	0.52	-0.61	-1.05	-0.17	-0.10	-0.85	0.65
	5	-0.01	-0.45	0.44	-0.31	-0.66	0.03	-0.06	-0.61	0.49
d15-20	0	0.53	-0.40	1.46	0.22	-0.35	0.79	-0.42	-1.38	0.55
	5	0.17	-0.44	0.78	0.23	-0.24	0.70	-0.31	-1.06	0.45
d20	0	0.79	-0.14	1.72	0.11	-0.46	0.68	0.40	-0.56	1.36
	5	0.57	-0.04	1.19	0.25	-0.22	0.72	0.28	-0.47	1.04

1/ 90 percent confidence interval. Highlighted if statistically significant different from zero.

Source: IMF staff calculations.

Annex I. Decomposition of Commercial and Small Business Sector De-dollarization

During the period 2001−2009, all commercial and small business sectors, with the exception of fishing, mining and electricity/water/gas, de-dollarized.



Source: SBS; and IMF staff calculations.

The decomposition of de-dollarization between and within components shows that half of the de-dollarization experienced by the commercial and business sectors is explained by the decline in dollarization within sectors, with manufacturing, commerce and real estate being the sectors contributing the most.

Peru: Decomposition of de-dollarization across commercial sectors

	Dollarization		Share in total credit (in percent)		2001-2009		
Sector	2001	2009	2001	2009	between effect	within effect	total effect
agriculture	90.1	73.8	3.2	2.7	-0.4	-0.4	-0.9
fishing	93.4	93.1	2.7	1.3	-1.4	0.0	-1.4
mining	94.9	95.5	6.3	3.9	-2.3	0.0	-2.3
manufacturing	84.6	67.5	22.7	18.3	-3.7	-3.1	-6.8
electricity, water, gas	75.8	86.4	3.4	4.4	0.8	0.5	1.3
construction	77.7	71.8	2.9	1.9	-0.8	-0.1	-0.9
commerce	68.1	49.3	18.4	14.0	-3.0	-2.6	-5.6
hotels	95.0	63.3	1.5	1.5	0.0	-0.5	-0.5
transport, storage, communication	68.1	43.1	4.4	6.1	1.2	-1.5	-0.4
financial	77.6	33.9	3.2	2.7	-0.4	-1.2	-1.6
real estate	84.5	58.7	6.1	5.4	-0.6	-1.4	-2.0
public administration, defense	36.3	8.8	0.9	0.3	-0.2	-0.1	-0.3
education	73.4	28.9	0.5	0.9	0.3	-0.4	-0.1
social services	67.5	44.9	0.4	0.3	-0.1	-0.1	-0.2
other servicies	83.7	44.7	2.1	1.9	-0.1	-0.7	-0.9
private households, domestic service	84.4	62.0	2.8	2.9	0.1	-0.7	-0.6
total commercial and small businesses	**79.8**	**61.4**	**81.6**	**68.6**	**-10.4**	**-12.7**	**-23.0**

Source: SBS; and IMF staff calculations.
1/ Credits in foreign currency are evaluated at a constant nominal exchange rate.

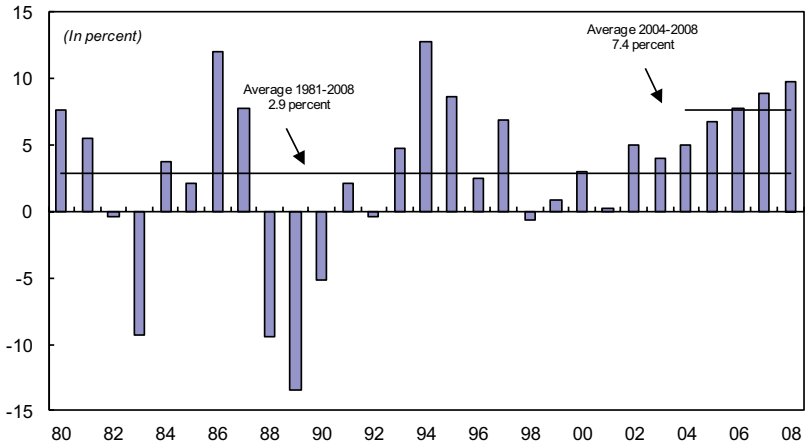
Potential Growth and Output Gap in Peru

This chapter[1] presents a range of estimates for the potential growth rate and the output gap in Peru, based on different statistical and economic methods. Potential growth is estimated to have increased to around 6¼ percent in 2002−2009, during the inflation targeting period, from about 3 percent in 1994−2001. Moreover, the results show a decline in the volatility of the output gap during the inflation targeting regime. The analysis also considers how a deceleration of trend global growth could affect Peru's trend growth. Estimates show that a fall of trend global growth by 1 percentage point could decrease Peru's trend growth by 1−1¼ percentage points.

I. Motivation

1. In recent years, Peru's growth increased substantially associated with a structural change in fundamentals that resulted in higher potential growth. Growth averaged 2.9 percent annually since the 1980s, but rose to 7.4 percent during 2004−08. Growth, which peaked at 9.8 percent in 2008, came to standstill in the first half of 2009 as the economy was affected by the global crisis. Higher growth with low inflation for over nearly a decade suggests that Peru's potential output has increased more rapidly than in the past. This is likely to reflect strong macroeconomic stability, higher investment, and reduced vulnerabilities. However, other factors such as a benign external environment during most of this period may also have contributed to higher growth. The analysis in this chapter attempts to shed some light on the extent to which the acceleration of trend growth in Peru reflects intrinsic fundamental factors and global conditions during the boom years.

Peru: Real GDP Growth, 1980-2008



Source: *Banco Central de Reserva del Perú.*

[1] Prepared by Leandro Medina (WHD).

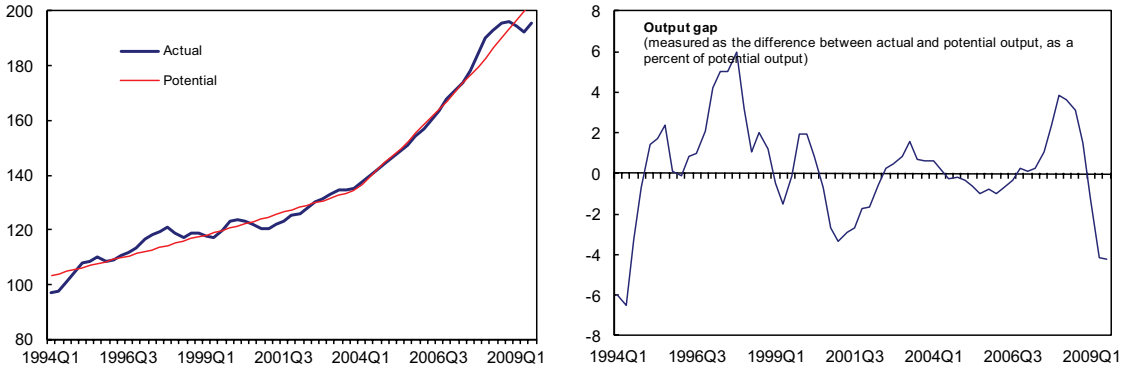
II. Measuring Potential Output and the Output Gap

2. Several methodologies are used to estimate potential output. These techniques, which decompose output into trend and cyclical components, may be grouped into two broad categories: those using univariate statistical procedures and those based on economic models. The former use time-series analysis to identify the permanent and cyclical components of output. Four sets of univariate techniques are discussed in this chapter: (i) piece-wise linear de-trending; (ii) filters that isolate high-frequency from low-frequency components (HP-filter, the Baxter and King filter, and the Christiano and Fitzgerald filter); and (iii) the Beveridge and Nelson decomposition. The methods based on economic models are: (i) the Kalman filter (with a Phillips curve, an IS curve, and an Okun's Law equation); (ii) an Aggregate Production Function approach; and (iii) structural vector autoregression.

Statistical (Univariate) Procedures

- Piece-wise linear de–trending. This approach fits a linear trend through the log GDP data, allowing for different trends in different subsamples. The Chow breakpoint test and the Quandt Andrews breakpoint test identify 2003Q4 as a structural break point in the GDP time series. This breakpoint coincides also with a change in the volatility of macroeconomic variables. Since 2003, Peru's adherence to a strong macroeconomic policy framework, together with favorable external conditions, resulted in reduced volatility and higher growth until the recent global financial crisis.

Peru: Linear Detrending, 1994Q1-2009Q3

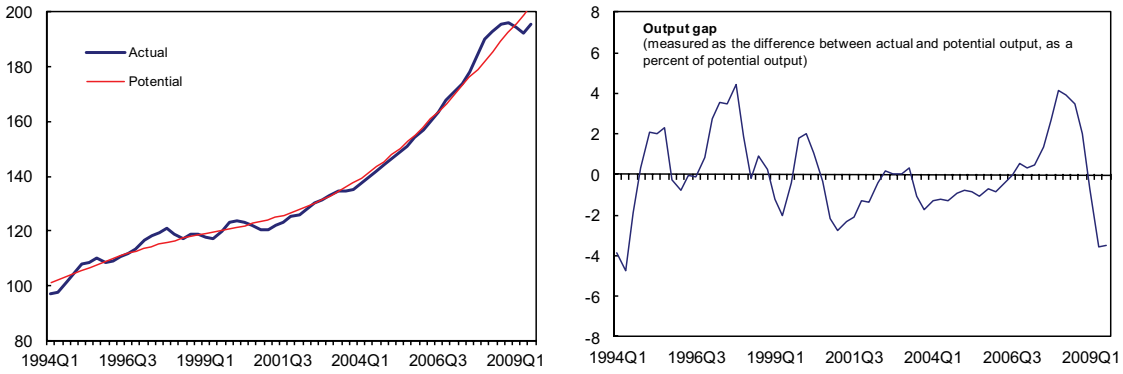


Source: IMF staff calculations.

- Hodrick Prescott (HP) filter. This filter provides a more flexible approach to discerning potential output. It calculates potential output as the series that minimizes the deviation of actual output and potential output, subject to a penalty on the maximum allowable change in

potential growth between two periods.[2] The higher the penalty, the smoother the series. Trend growth is estimated at 6.27 percent, and the results show that the economy was overheated at end-2008, with a positive output gap of about 4 percent. The global financial crisis resulted in a rapid deceleration of growth starting in 2008Q4. The negative output gap at end-2009 is estimated at -4 percent.

Peru: Hodrick-Prescott Filter, 1994Q1-2009Q3



Source: IMF staff calculations.

- Baxter and King (1999) and Christiano and Fitzgerald (2003) (BK and CF) band pass filters. These filters use a range of business cycle frequencies to compute the cyclical component of output.[3] The results are similar to the ones reported by the HP filter, only that there is a smoother computation of the output gap.

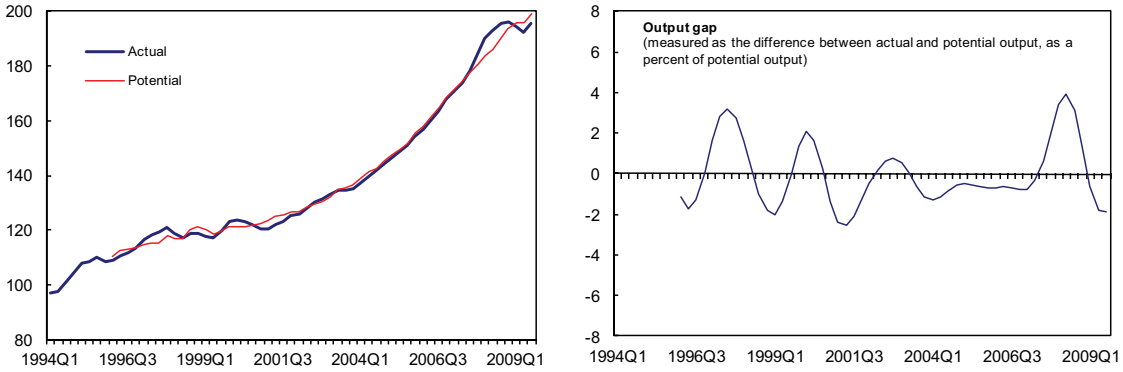
- Beveridge and Nelson (1981). This approach tackles the calculation of the trend output and output gap by decomposing a non–stationary time series (real GDP) into a non–stationary trend and a cyclical component by applying the Box-Jenkins (1976) methodology that fits an ARIMA (p,d,q)[4] model to the GDP series.

[2] Following extensive literature, the adjustment of the sensitivity of the trend to short-term fluctuations is achieved by modifying a multiplier λ as standard in the literature λ =1600 for quarterly data.

[3] In order to address the end-of-sample bias, data on quarterly projections for 2010−11 were considered when running the filter (8 leads and lags). Excluding projections does not change significantly the estimates of potential growth during the two periods. Default ranges are chosen (6−32 cycle periods).

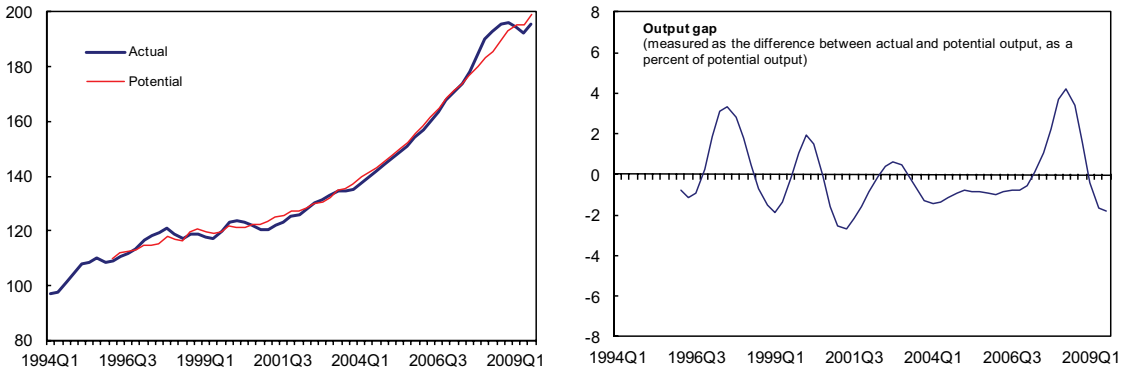
[4] In this case *p* refers to the number of autoregressive lags, *d* refers to the order of integration, and *q* gives the number of moving average lags.

Peru: Baxter and King Filter, 1996Q1-2009Q3



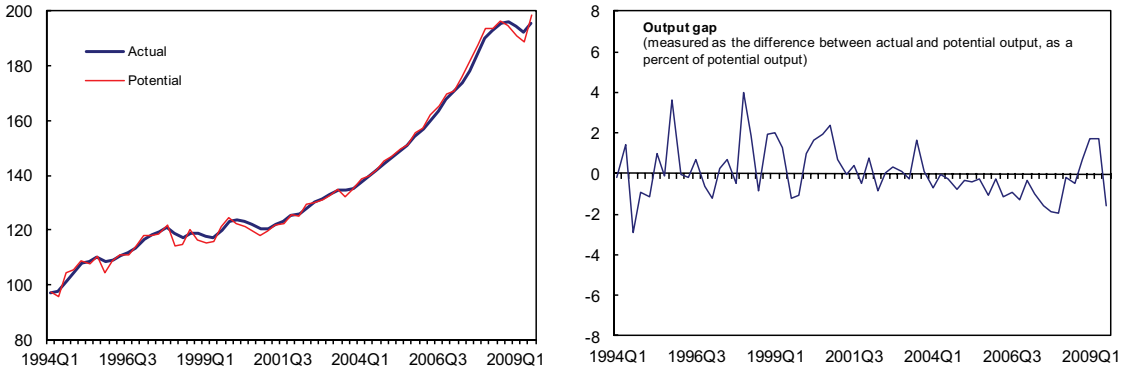
Source: IMF staff calculations.

Peru: Christiano and Fitzgerald Filter, 1996Q1-2009Q3



Source: IMF staff calculations.

Peru: Beveridge and Nelson Decomposition, 1994Q1-2009Q3



Source: IMF staff calculations.

3. Overall, the statistical procedures show an increase in potential output growth to about 6¼ percent during the inflation targeting period from less than 3 percent in the period before. Estimates of potential growth are reported in two periods, taking into account the implementation of the inflation-targeting framework in 2002. On average, potential growth increased by more than

4 percentage points. The estimates of the output gap show that the positive gap (excess demand) peaked in the first half of 2008 (3−4 percent), but turned negative in the first half of 2009.

Table 1: Peru. Estimates of Potential Growth according to Univariate Techniques

	1994Q1-2001Q4	2002Q1-2009Q3
Linear detrending	2.74	6.30
Hodrick and Prescott	2.97	6.27
Baxter and King	2.49	6.03
Christiano and Fitzgerald	2.60	5.99
Beveridge-Nelson	3.54	6.15
Average	2.87	6.15

Source: IMF staff calculations.

Economic (Multivariate) Procedures

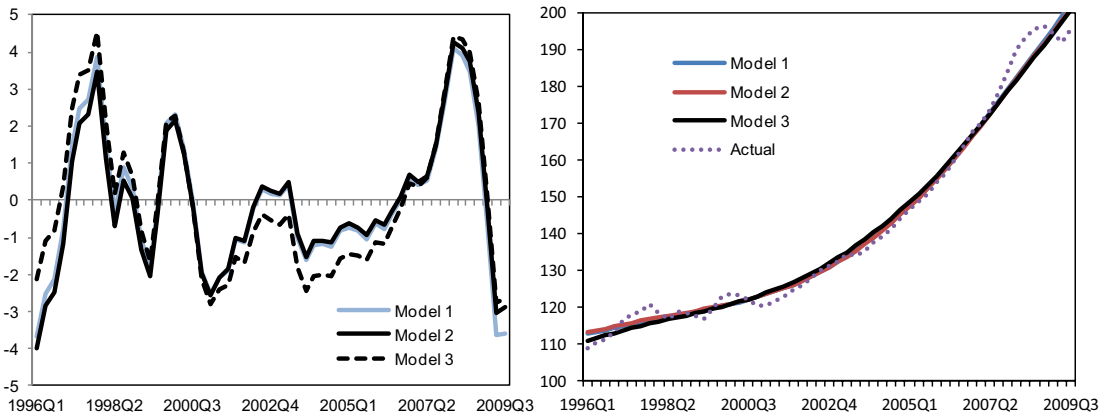
4. This section estimates Peru's potential output using methodologies based on economic models. First, the Kalman filter is used exploring three variants based on: (i) the Phillips' curve; (ii) the IS curve; (iii) and the Okun's law. Second, an aggregate production function approach is used. Finally, the Blanchard and Quah (1989) methodology is applied.

- Multivariate Kalman filter. This filter improves univariate methods by adding economic information such as the Phillips' curve, Okun's law or the IS curve. The use of macroeconomic relations can reduce the end-of–sample bias of most univariate filters as well as increase the theoretical foundation of purely statistical models.[5] This section follows Fuentes, Gredig and Larrain (2008) and applies three models. Model 1 adds the Phillips curve as a second signal equation to the system. The assumption is that deviations in core inflation relate directly to the output gap and therefore provide important information to determine the evolution of the GDP trend. Model 2 incorporates the policy rate, while Model 3 adds Okun's Law to capture information from the labor market (using a transition equation for the NAIRU[6]).

[5] For a more detailed explanation see Fuentes *et al.* (2008), Anderson and Moore (1979) and Harvey (1991).

[6] Non-accelerating Inflation Rate of Unemployment, and refers to a level of unemployment below which inflation rises.

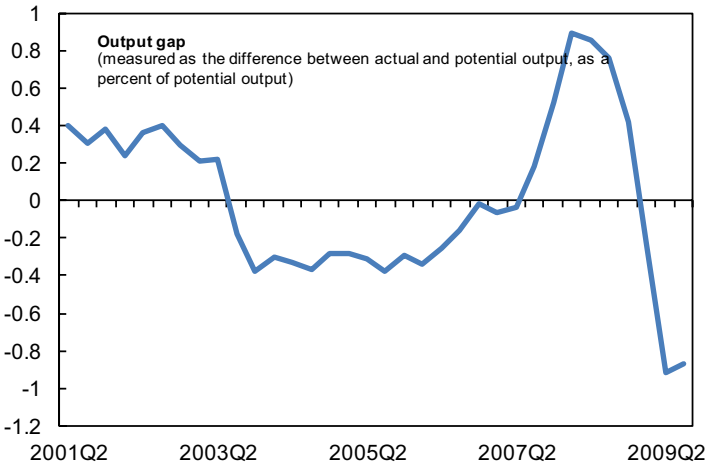
Multivariate Kalman Filter, 1996Q1-2009Q3



Source: IMF staff calculations.

- Aggregate production function (APF). This approach uses a functional relationship between output and factor inputs, typically a Cobb-Douglas representation. The parametrization of Peru's production function follows Gollin (2002), Fuentes (2008), and Seminario and Beltran (1998). As factor inputs, the analysis considers active population and capital stock (computed according to the perpetual inventory approach with an estimated depreciation rate of 5 percent.

Aggregate Production Function, 2001Q2-2009Q3

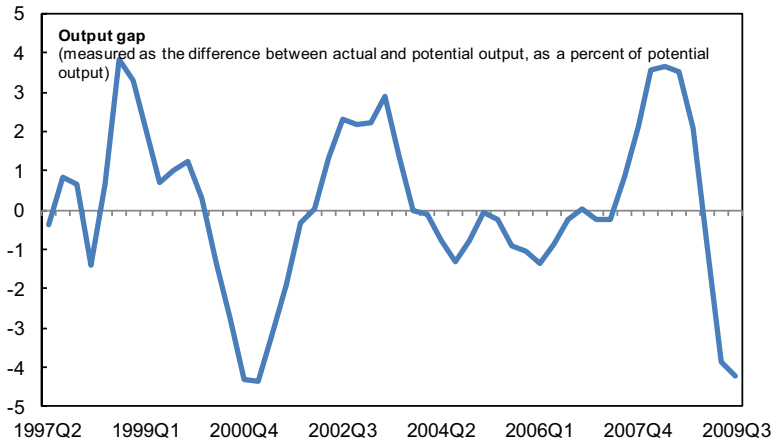


Source: IMF staff calculations.

- Blanchard and Quah (1989). This structural vector autoregression (SVAR) approach allows for the identification of shocks to real GDP, assuming that demand shocks have no

permanent effect on output, while supply shocks may have. It uses the unemployment rate to identify demand shocks.[7]

Blanchard and Quah SVAR, 1997Q2-2009Q3



Source: IMF staff calculations.

5. Multivariate estimates confirm that Peru has doubled its potential growth rate during the inflation targeting period. The potential growth using multivariate methodologies is estimated at around 6¼ percent during 2002−2009, compared to less than 2¼ percent in the period before.

Table 2: Peru. Estimates of Potential Growth according to Economic Methods 1/

	1994Q1-2001Q4	2002Q1-2009Q3
Kalman Model 1	1.98	6.30
Kalman Model 2	1.92	6.20
Kalman Model 3	2.34	6.10
Aggregate Production Function	-	6.60
Blanchard and Quah	2.30	6.49
Average	2.13	6.34

Source: IMF staff calculations.

1/ Due to data availability, estimation starts in 1996Q1.

[7] The SVAR estimation uses 5 lags for the endogenous variables, as indicated by the Akaike Information Criterion (AIC) and the Final Prediction Error (FPE) Criterion.

Change in Output Gap Volatility

6. Using univariate and multivariate estimations, there is evidence of reduced volatility of the output gap during the inflation targeting framework. The average estimated standard deviation of the output gap fell to 1.6 percent during the IT period from over 2 percent in the period before. This reduction in output gap volatility was found far all estimation methodologies.

Table 3. Estimates of Output Gap Volatility 1/

	1994Q1-2001Q4	2002Q1-2009Q3
Linear detrending	2.78	1.77
Hodrick and Prescott	2.12	1.82
Baxter and King	1.82	1.43
Christiano and Fitzgerald	1.83	1.57
Beveridge-Nelson	1.51	0.96
Kalman Model 1	2.02	1.81
Kalman Model 2	1.96	1.77
Kalman Model 3	2.11	2.04
Aggregate Production Function	-	1.17
Blanchard and Quah	2.31	1.94
Average	2.05	1.63

Source: IMF staff calculations.

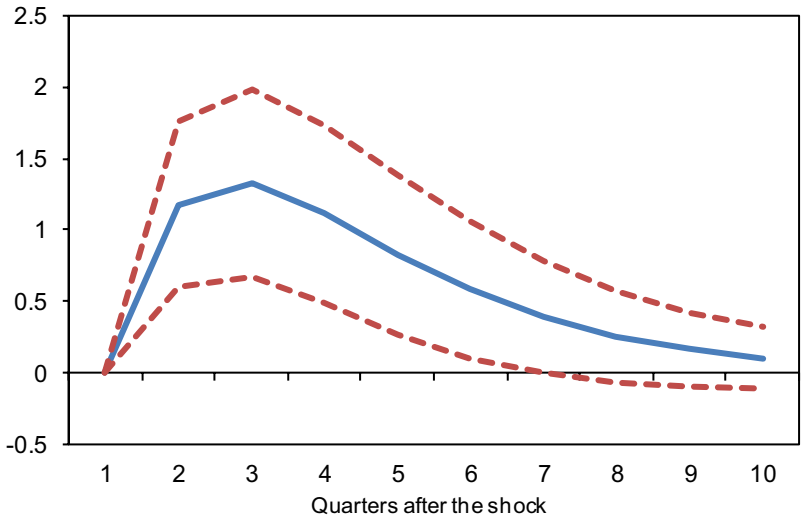
1/ Measured as output gap's standard deviation.

III. Peru's and Global Growth

7. Peruvian growth is sensitive to global growth conditions. Using a VAR methodology, this section tries to assess the impact of global growth on Peru's growth, and its potential implication for trend growth. Two samples are considered using quarterly data: (i) one covering the whole period (1996−2009), and (ii) the inflation targeting subsample (2002−09). The estimated impulse response function shows a positive impact on Peru's GDP of a global growth innovation, with a peak impact in two to four quarters.[8]

[8] The solid line represents the response to one unit innovation in World GDP growth. Dotted lines reflect two-standard deviation bands.

Peru GDP growth response to a unitary shock in World growth



Source: IMF staff calculations.

8. Global growth fluctuations account for a significant fraction of growth fluctuations in Peru. To quantify the contribution of global growth shocks to fluctuations in Peru's growth, a variance decomposition analysis was performed for the full sample. The results show that global growth has accounted for nearly a quarter of Peru's GDP fluctuations at a ten-quarter horizon. The variance decomposition analysis for the IT period shows a higher share at almost 60 percent, reflecting the reduction in idiosyncratic volatility that characterized the period of macroeconomic instability in Peru.

Table 4. Variance Decomposition of Peru Growth

Period	PER_G	WORLD_G
1	94.91	5.09
2	87.62	12.38
3	82.35	17.65
4	79.41	20.59
5	77.97	22.03
6	77.32	22.68
7	77.04	22.96
8	76.93	23.07
9	76.89	23.11
10	76.87	23.13

Source: IMF staff calculations.

9. The impact of a reduction of trend global growth on Peru's trend growth would be, at least, one to one. A scenario where global trend growth does not recover to its pre-crisis growth rate, for instance a reduction of ½ a percentage point, would reduce Peru's trend growth by about ½ percentage point, from 6¼ to 5¾ percent over the next few years.

Table 5. Average Growth Estimations 2010-11

		Historical	H -0.5%	H -1%
2002Q1-2009Q3	World	4	3.5	3
	Peru	6.3	5.8 - 5.7	5.3 - 5.1

Source: IMF staff calculations.

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Progress in Strengthening Peru's Prudential Framework

This chapter[1] reviews the reform progress since the 2005 FSAP Update. It focuses on prudential regulation and supervision, crisis management and resolution framework, banking sector issues, and reforms not directly linked to the FSAP. The preliminary findings suggest that progress has been substantial, with some areas where additional progress would further strengthen the prudential framework. Moreover, Peru has been a pioneer in implementing reforms that are now considered key regulatory measures, including dynamic loan loss provisioning. However, the recent global financial crisis has created new challenges, including a still evolving international debate on the key aspects of the new regulatory framework.

I. Background

1. The Peruvian financial system has been strengthened over the last decades thanks to an improved prudential framework and consolidated macroeconomic stability. Major financial sector reforms were introduced in the 1990s. Key policy changes included the liberalization of interest rates, elimination of government interventions in credit allocation and credit subsidies, and opening of the capital account. In addition, a large number of state-owned banks were privatized or liquidated, the regulatory and supervisory framework for financial institutions was substantially overhauled, and a system of private pension funds (AFPs) was established. New domestic banks were authorized and foreign banks were allowed entry to invest in domestic banks and acquire majority ownership. A new central bank law was passed which granted autonomy to the BCRP and prohibited its direct lending to the government, while an inflation targeting regime was successfully introduced. The financial markets have undergone significant change in the last few years, with expansion of credit to new segments and the emergence of new financial instruments.

2. Peru's financial system withstood the global financial crisis well, reflecting solid fundamentals and a proactive policy response to avoid a liquidity squeeze. Peru's banking system is profitable, liquid, and well capitalized. The strength of the financial system resides in applying lessons from past crises opportunely and creating a strong and supportive regulatory environment, in many areas ahead of international standards.

II. Findings of the 2005 FSAP Update

3. The 2005 FSAP Update found that the financial sector had recovered from the crisis of the late 1990s and early 2000, but recognized some risks and vulnerabilities. On the positive side, banks were better capitalized, more profitable, and more liquid, and the quality of their loan

[1] Prepared by J. G. Gasha and P. Imam (MCM).

portfolio had improved. Financial dollarization, an important source of vulnerability for banks, remained high, despite sound macroeconomic policies that contributed to a gradual decline. While banks' vulnerability to market risk appeared to be modest due to stringent prudential regulations, banks were deemed vulnerable to foreign currency induced credit risk. Substantial progress had been made in strengthening the legal, regulatory, and supervisory framework for banking activity. However, further progress was found to be needed in several areas: legal protection of supervisors, regulations on restructured loans, elimination of accounting practices not in line with International Accounting Standards, consolidated supervision, and supervision of offshore financial institutions.

4. Moreover, the 2005 FSAP Update highlighted developmental issues and challenges faced by the financial system. The local capital markets were small and illiquid. Micro finance institutions were growing rapidly, but from a small base. The rapidly growing private pension system had low coverage and competition, and commissions were high. The government's domestic debt market, which was virtually non-existent in 2000, had started to developed and debt management had been strengthened substantially, but there was still room for further improvements. The payments and settlement systems were much stronger than in 2000, and transparency of monetary and financial policies had improved.

III. Prudential Regulation and Supervision

5. The amendment of the General Banking Law (GBL) to introduce legal protection for supervisors was a key milestone to strengthen the regulatory framework. The GBL amendment, providing legal protection to all personnel of the Superintendence of Banks (SBS) against criminal and civil lawsuits when carrying out official duties in good faith, helped reinforce the authority of the SBS. Nonetheless, there is still need to de-link the appointment of the Superintendent from the electoral cycle.

6. Providing the SBS with the power to revoke licenses or prohibit banks from jurisdictions that do not allow the SBS to conduct effective supervision of offshore institutions on a consolidated basis would still need to be implemented. Legislative changes are not deemed urgent, as the problem does not appear to be pressing. By law, the opening of branches or subsidiaries abroad requires prior approval of the SBS, reducing the risk of domestic banks getting involved into overseas activities unknown to the SBS. Moreover, in jurisdictions where the supervised institutions have operations through branches, subsidiaries or affiliates, the SBS has in practice been able to exercise oversight in coordination with the foreign supervisor.

7. The SBS has reached agreements with other relevant regulators to improve information sharing and cross-border supervision. Legislation was passed allowing the SBS to sign agreements with foreign banking and insurance regulators to strengthen cross- border supervision, and with other national supervisory bodies to enhance supervisory coordination and regulatory consistency and to facilitate staff training. Memoranda of Understandings (MoU) and other information sharing agreements were signed with financial regulators from Mexico,

Nicaragua and the Bahamas as well as with the Superintendence of Private Pension Funds of Chile. Domestically, the SBS signed MoUs with the Securities Exchange Commission (CONASEV) in January 2008 and more recently the BCRP which, once implemented, will further contribute to better information exchange.

8. To further reduce risks arising from information gaps, notably on internationally active entities, the SBS has the authority to impose prudential measures, including higher provisions. When the SBS is unable to review and inspect bank assets, it can order remedial actions. In practice, the SBS has imposed provisions reaching 100 percent of the value of the off-shore assets for which information was lacking. Such a tool protects the domestic financial system from risks arising overseas and provides incentives to banks to provide information on their overseas activities.

9. Regulations were also strengthened to mitigate credit risk from lending in foreign currency to domestic agents. To improve currency matching and to support the de-dollarization process, prudential measures were introduced by the SBS in 2006. These measures promote managing and reporting foreign exchange credit risk of domestic borrowers by identifying debtors subject to exchange rate risk and introducing generic provisions for "unidentified" portfolio which could potentially carry foreign currency induced credit risk.[2] Starting in July 2010, banks lending to borrowers deemed un-hedged and risky (following stress testing) will be required higher loan loss provisioning. New lending programs in domestic currency, such as *MiHogar* and *Techo Propio*, have been initiated to assist lower income groups. Legal, regulatory and infrastructural requirements are being set up to have covered mortgage bonds that would further encourage mortgages to be issued in Nuevo Soles.

10. To improve the loan classification system and better identify credit risk, regulations governing restructured loans have been strengthened to link borrowers' upgrades with a demonstrated repayment track record. In 2005 the SBS passed a resolution whereby, following loan restructuring operations, the debtor's classification would initially remain unchanged for new or refinanced loans. Over time, subject to a debtor making timely payments, the credit rating can be improved by one category every two quarters. If a debtor has difficulties paying the loan, it will be reclassified into a higher risk category. Such an asymmetric classification system aims at anticipating potential bad credit, and taking timely action.

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[2] The guarantees and provisions of the "good payer bonus" on mortgages in foreign currency were discontinued to ensure that most new mortgage loans guaranteed by MiVivienda (a decentralized entity of the Housing Ministry that is a second-tier lender to banks for mortgages under US$30,000) are denominated in Nuevo Soles. The "Bono de Buen Pagador" was a discount applied to the remaining credit amount when borrowers paid their credit on time. Part of *MiVivienda*'s foreign currency portfolio was also converted into Nuevo Soles.

IV. Crisis Management and Resolution Framework

11. The framework for crisis management and resolution has been strengthened, but further reforms could be advanced. A Coordination Committee, comprising senior officials from the Ministry of Finance, the Central Bank, and the SBS has been established in 2008 to strengthen the framework to manage systemic risk. The central bank developed a mechanism to inject liquidity during periods of systemic stress to smaller entities that hold sufficient 'good' collateral. The framework for intervention has also been clarified, whereby intervention will be triggered when a bank loses fifty percent or more of its capital within a 12-month period. This measure, however, do not provide an automatic intervention mechanism, with the President or Congress needing to intervene through a decree or legislation. The approval of an intervention program requires that the functioning of the financial system be impaired, that the costs of intervention be lower than the cost of bankruptcy, and that banks seize dividend payments. To strengthen the system further, clarifying operational aspects and responsabilities for resolving systemic issues would be important.

12. The BCRP has widened the instruments that can be used as collateral to provide liquidity through repo operations. The range of collateral acceptable for repo transactions now includes preferred share certificates issued from a public trust, receivable loans of companies in the financial system, mortgage instruments, and foreign currency loans issued by Cajas Rurales de Ahorro y Crédito.

13. The current resources of the Deposit Insurance Fund (FSD) would cover insured deposits of all institutions except the largest four. The Financial System Law provides the FSD funding through premiums, fines, and returns on assets, with current resources in the FSD at US$315 million. The reserve ratio—the ratio of FSD funds to total insured deposits—is at 2.56 percent, above the average of reserve ratios in Latin America. The Treasury, however, can provide the FSD with a credit line in case it is insufficient to cover insured deposits.

14. The coverage of the FSD is high for international standards. With a covered maximum amount of S/. 88,045 (about US$30,000), 98 percent of all accounts are currently insured. The generosity of the deposit insurance scheme (measured as a share of average income) is high relative to other countries. Even if the covered maximum amount was reduced in half, it would still cover over 90 percent of accounts.

15. Banks under enhanced surveillance of the SBS are not allowed by legislation to receive central bank's loans. However, the BCRP's ability to provide liquidity has been strengthened significantly by expanding the assets that can be used for repo operations and creating a public trust fund, through asset swaps.

V. Banking Sector Issues

16. Incentives have been set in place for banks to adopt and implement risk management practices for credit, market, and operational risks. Amendments to the General Banking Law and Organic Law of the SBS were approved by Congress in 2008, which aimed at introducing minimum capital requirements for credit, market, and operational risks in line with Basel II. The minimum capital adequacy ratio was raised from 9.1 percent to 9.5 percent in June 2009, and will reach 10 percent by July 2011. However, to give financial institutions more flexibility in the midst of the global financial crisis, a progressive increase of risk weighted assets (RWA) was implemented through July 2012. In addition, starting in June 2009 the authorities increased the "shadow" CAR from 10.5 percent to 11 percent. Requirements for treating subordinated debt as Tier 2 capital have also been strengthened relative to standard international practice. The introduction of capital requirements for foreign-currency-induced credit risks, in line with Pillar II of Basel II, is an important step forward to strengthen further the resilience of the banking system to exchange rate shocks.

17. Contingent public liabilities from public banks have been reduced, and subsidies to public banks have become more transparent. The authorities sent to Congress amendments to the Banking Law to fully align the oversight of public financial institutions with that of the rest of the banking system, including by strengthening the provisions on operational limits, and the selection of senior management positions. Aligning the regulatory and supervisory framework of public institutions with that of private banks, while closely monitoring their lending practices and implicit subsidies, will help ensure a competitive playing field in the financial sector.

VI. Other Issues

18. The BCRP has been legally empowered to oversee and regulate the entire payment system. At end-2009, the Payment System and Securities Settlement law was passed, which gives the central bank the power to regulate and oversee the entire payment system. The law protects the money that passes through the payment system and ensures the completion of transaction as well as the continuity of the payment chain. The law also grants CONASEV the authority to supervise and regulate the payment system and securities settlement with the public interest in mind, further protecting users and encouraging use.

19. The limits on AFP's overseas investments have been increased. The legal ceiling on pension funds' investments abroad has been raised in several stages, to 30 percent, paving the way for further portfolio diversification. While the overall maximum legal limit was raised to 30 percent, the BCRP regulates the operational limit, which was increased from 20 percent to 24 percent in early 2010.

VII. Other Reforms Not Linked to the FSAP

20. To reduce pro-cyclicality in lending and strengthen banks' asset quality over the cycle, dynamic provisioning was instituted at end-2008. In contrast to static provisioning, where

provisions are set in a backward looking manner; dynamic provisioning requires financial institutions to recognize loan losses in good times which, on past experience, will materialize later in the business cycle. The introduction was a result of several years of double-digit credit growth to help stabilize the credit cycle. Dynamic provisioning led to an increase in provisions of about 1 percent of the total portfolio. Moreover, the Superintendence of Banks put in place a program to increase and improve the quality of the capital base, with some banks required to capitalize nearly 70 percent of 2008 profits.

21. Legislation specific to microfinance institutions is in the process of approval, with the aim of strengthening the resilience of this sector. Legislation to increase the minimum capital requirement for microfinance institutions and to include all public financial institutions under the umbrella of SBS is awaiting plenary Congress approval. Minimum capital requirements will be increased from S/. 200,000 to S/. 1 million for new cajas rurales and S/1.6 million for new cajas municipales. Existing microfinance institutions have been given 2 years to comply with new requirements. The authorities have recently passed legislation that allows these institutions to engage in securitization and trading of fixed income product, including the purchase of central bank paper (which could be used as collateral for liquidity support) permitting direct participation in the payments system (subject to central bank approval).

VIII. Challenges Ahead

22. **Although Peru's prudential framework is strong, ahead of international standards in many areas, the global financial crisis has created new challenges.** The evolving international discussions on a new regulatory framework present a moving goalpost for the road ahead. Key issues comprise: (i) mitigating *pro-cyclicality*; (ii) enhancing *transparency*; (iii) aligning the *incentive structure*; (iv) strengthening *cross-border cooperation*; (v) improving *macro-prudential supervision* to limit systemic risks; and (vi) expanding *the perimeter of regulation and supervision* to institutions previously not supervised which pose systemic risks. Peru has been a pioneer in the area of reducing pro-cyclicality, and has also strong transparency and disclosure standards. The global crisis has shown that coordination of the BCRP, SBS and the Ministry of Finance has in practice been effective, but further improvements could define more clearly the roles and responsibilities. On the perimeter of regulation, the coverage could be reviewed to ensure that all systemically important institutions are included, individually or as a group, such as cooperative banks.