

# IMF Working Paper

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## Fiscal Stimulus and Credibility in Emerging Countries

*by*

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**Fiscal Stimulus and Credibility in Emerging Countries**

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**Abstract**

**This Working Paper should not be reported as representing the views of the IMF.**

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Across a sample of thirty four emerging countries, the evidence shows the frequent existence of a pro-cyclical fiscal impulse. However, the scope for countercyclical policy increases with the availability of international reserves as it enhances credibility and mitigates concerns about the effect of expansionary fiscal policy on the cost of borrowing and debt service. The paper also examines the effectiveness of the fiscal policy in emerging countries in the short- and long-run and its underlying conditions, which does not appear to be uniform. In some cases, contractionary fiscal policy could stimulate growth in the short-run, if fiscal tightness lowers the cost of borrowing and debt service, and mitigates concerns about debt sustainability. However, an increase in international reserves is evident to mitigate these concerns. On the other hand, high inflation increases concerns about the impact of fiscal spending on inflationary expectations and the cost of borrowing, countering the effectiveness of the fiscal stimulus on output growth in the short-run. Where the debt burden is high, fiscal expansion has a long-lasting negative effect on real growth.

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Contents	Page
I. Introduction .....	3
II. Literature Review .....	5
III. Data and Econometric Methodology .....	6
IV. Empirical Results.....	7
V. Conclusions.....	15
VI. Appendix.....	17
VII. References .....	23
 Tables	
1. Fiscal Impulse Fixed Effects Regression.....	8
2. Panel Vector Error Correction Estimates.....	10
3. Panel Vector Error Correction Estimates.....	12

## I. INTRODUCTION

**The deep global recession has focused attention on the need for counter-cyclical macroeconomic policies.** The scope for monetary policy was hampered by the credit freeze in the financial system, which was constrained by the accumulation of toxic assets awaiting a resolution to restore confidence and efficient intermediation.<sup>2</sup> While a heated debate has emerged on the specifics, the need for fiscal intervention to support demand proved to be larger and of longer duration than initially envisaged. Further, there is a need to consider lags governing the fiscal policy transmission to decide on the speed of fiscal withdrawal without jeopardizing the recovery efforts.

**The debate surrounding the effectiveness of fiscal policy is two-fold:**

- First is the composition of fiscal stimulus. Choices have to be made between tax incentives and government spending, and the allocation of spending between current spending (e.g., extended unemployment benefits and transfers) and capital spending (e.g., infrastructure and new projects). Tax changes that improve incentives to work or induce greater private investment, and productive public investment in human capital and infrastructure contribute to productive capacity and improve the economy's potential output in the long-run. Sustained reductions in sales taxes and unproductive public consumption or measures that further artificially boost private consumption could run the risk of higher inflation and imports, increasing pressures on the current account and the international reserve position. Indeed, even poorly conceived infrastructure spending that generates a low rate of return may not generate sustained economic activity, while interfering with incentives for private activity.
- Second is the concern about fiscal space. Can governments afford the cost of the fiscal stimulus, hoping for higher revenues once recovery is at full speed to service the new debt and ensure sustainability? While fiscal expansion may be necessary to stimulate economic activity, not every country has the resources to finance fiscal stimulus. Some countries do not have enough fiscal space to run countercyclical policy during a recession with limited access to financing from international capital markets, and high concerns about policy credibility and debt sustainability.<sup>3</sup>

**The need for fiscal stimulus necessitates a careful evaluation of fiscal space and available financing.** Fiscal policy in emerging market countries tends to be pro-cyclical because capital flows and commodity exports drive business cycles in these countries. So, when capital flows dry up and commodity prices plunge, financing an expansionary fiscal

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<sup>2</sup> For more details, see Blinder (2004), "Under *normal* circumstances, monetary policy is a far better candidate for the stabilization job than fiscal policy. ... That said, however, there will be occasional *abnormal* circumstances in which monetary policy can use a little help, or maybe a lot, in stimulating the economy ---such as when recessions are extremely long and/or extremely deep, when nominal interest rates approach zero, or when significant weakness in aggregate demand arises abruptly".

<sup>3</sup> As argued in Freedman et.al (2009), while the IMF has called for fiscal stimulus in as many countries as possible, some countries have financing constraints—either high borrowing costs or difficulties in financing deficits at any cost—while others are constrained by high debt.

policy becomes increasingly difficult.<sup>4</sup> Nonetheless, in response to the global slowdown, a number of emerging markets have announced fiscal stimulus plans to revive economic conditions and assist a speedy recovery.

**The issue of affordability has turned attention to available international reserves.**

Countries with adequate international reserves would be seen as more credible and better positioned to respond with fiscal stimulus, with less concern about crowding out private activity. Reserves availability would increase the scope for accommodating monetary policy, relaxing domestic financing constraints and reducing the risk of crowding out private activity. Furthermore, reserves adequacy would improve credit rating, reducing the risk premium on external financing. Among countries with abundant international reserves are energy-producing countries that have built cushions during the recent surge in world energy prices.<sup>5</sup> Other emerging countries such as China and Brazil have also accumulated record high international reserves, benefiting from a surge in export prices, robust demand and sustained capital inflows.

**Countries with a limited pool of international reserves tend to have less scope for fiscal stimulus.** In their case, fiscal expansion tends to push up borrowing costs, which reduces the credibility of fiscal expansion as it crowds out private activity and offsets the effectiveness of the stimulus. A number of developing countries have become increasingly resource constrained as they continue to struggle to safeguard international reserves in the face of a surge in the cost of imports, particularly for food and fuel, and mounting external debt service costs, which present severe pressures on their limited foreign resources. Countries that have come into the crisis with excessive fiscal deficits or public debts—or that have current account deficits which can no longer be financed—had little room for maneuver. Likewise, loss of revenues—particularly commodity-related or import-related taxes—may also constrain fiscal space.

**The objective of our investigation is to evaluate the scope for fiscal stimulus across two groups of countries, using the availability of international reserves as the dividing benchmark.** The first group is countries that have adequate reserves, defined by international reserves that equal to or exceed 3 months of imports.<sup>6</sup> The second group is resource-constrained countries with international reserves below the equivalent of three months of imports. We seek to study the implications of these differences and other financing constraints on the credibility and effectiveness of fiscal policy in emerging countries.

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<sup>4</sup> See, e.g., Kumar and Ter-Minassian (2007).

<sup>5</sup> Husain, Tazhibayeva, and Ter-Martirosyan (2008), using panel VAR analysis and the associated impulse responses indicate that in countries where the energy sector is large in relation to the economy, energy price changes affect the economic cycle only through their impact on fiscal policy.

<sup>6</sup> Reserves adequacy is defined, following the literature on optimal reserves (see Jeanne and Ranciere (2006)), as the equivalent of three months of imports. We do consider the sensitivity of the results to a change in the benchmark to a higher level of reserves, relative to imports. We also consider a continuous increase in reserves availability, instead of a discrete dummy based on a specific benchmark. The thrust of the results remains robust.

## II. LITERATURE REVIEW

**A number of studies have considered the cyclicity of fiscal policy, differentiating between emerging and high-income countries.** A large empirical literature (see, e.g., Ilzetzki and Vegh (2008)) has found that fiscal policy in developing countries tends to be procyclical, in contrast to high-income countries where it is more often countercyclical. IMF (2009a) suggests that policy has tended to be less countercyclical in emerging market economies with a fixed exchange rate. Hemming et.al (2002) conclude that the appropriate fiscal stance during a downturn will depend on a range of factors, and only a country-by-country approach, and indeed an episode-by-episode approach, can reveal whether a fiscal expansion or contraction is appropriate. Conditioning factors include the source of the downturn, the response of interest and exchange rates, accompanying policies, debt sustainability, the composition of the fiscal impulse, and influences on private behavior.

**Others have focused on the limitations of effectiveness of fiscal policy.** Freedman et.al (2009) emphasize that temporary fiscal expansion can be highly effective provided that monetary policy is accommodative, involve multiple-country coordination, and that the right fiscal instruments are used. Similarly, the IMF World Economic Outlook (WEO 2009, chapter 5), highlights that discretionary fiscal policy can successfully stimulate output if stimulus packages are implemented in a timely manner and without interfering with debt sustainability. Spilimbergo et.al (2008) point that the optimal fiscal package to confront the global crisis should be timely, large, lasting, diversified, contingent, collective, and sustainable. However, at the same time, Eskesen (2009), using data for Singapore, provide evidence that the impact of fiscal policy may well be short-lived, especially where economic agents are not credit-constrained and/or have a high propensity to save, monetary focus is on price stability, and leakages are high due to economic openness.

**A third group of studies has focused on structural factors that differentiate the effectiveness of fiscal policy in industrial and emerging market economies.** Theory suggests that an expansionary fiscal stance is likely to be more effective in stimulating aggregate demand if the economy is relatively closed, has a pegged exchange rate, substantial spare capacity, a high proportion of credit-constrained households or firms, and a sustainable public debt position<sup>7</sup>. Taking these dimensions into account, conditions in emerging market economies could be less conducive to fiscal policy effectiveness, as supported by the empirical evidence (see, e.g., Ilzetzki and Vegh (2008) and Freedman and others (2008)). Lane (2003) provides evidence that emerging market economies have been structurally more exposed to business cycles, and have coped less well in smoothing the impact of fluctuations. In such case, improving the quality of domestic institutions should take priority to establish a stable macroeconomic environment and enhance the effectiveness of fiscal policy.

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<sup>7</sup> See IMF (2009a). Under a flexible exchange rate system, expansionary fiscal policy could lead to higher interest rate that increases capital inflows and appreciates the exchange rate. The resulting negative effect on exports counters the effectiveness of fiscal policy.

### III. DATA AND ECONOMETRIC METHODOLOGY

**This paper examines the cyclicity of the fiscal impulse and its effectiveness to stimulate real output growth in emerging countries:**

- In the first step, we analyze the variability and timing in the fiscal impulse, the degree of response to the output gap, and conditions for the cyclicity of the fiscal impulse. A fixed effects model is used to regress the fiscal impulse on the output gap alone and interacted with other dummy variables for inflation, reserves availability, the debt ratio, and openness to trade. The model specification is as follows:

$$Fiscal\ Impulse_{i,t} = \alpha_i + \beta Output\ Gap_{i,t} + \gamma Dummy_{i,t} Output\ Gap_{i,t} + \varepsilon_{i,t}$$

where the fiscal impulse for country  $i$  at period  $t$  is defined as the cyclically neutral general government balance, assuming economic conditions remain stable at last period's, minus the actual balance. Accordingly, a decrease in the fiscal impulse (a lower surplus or a larger deficit) represents discretionary fiscal expansion. The output gap is defined as logarithm of actual output over potential. The interactive dummies capture reserves adequacy (reserves that are equal to or exceed three months of imports), high debt ratio to GDP (50 percent or above), high inflation (ten percent or above), and the defacto exchange rate regime (1 for fixed, 2 for intermediate, and 3 for floating). Figure 1 in the appendix provides summary charts for the dummy variables used.

- In the second step, a VEC model is estimated to differentiate the effects of the fiscal impulse on output growth in the short- and long-run. The model specification is as follows:

$$\Delta Y_{i,t} = \sum_{k=1}^j C_k \Delta Y_{i,t-k} + EC_{t-1} + \varepsilon_{i,t}$$

where  $Y_{i,t}$  is a vector of variables for country  $i$  at period  $t$ , first-differenced for stationarity<sup>8</sup>. The vector  $Y$  comprises the list of variables in the vector autoregression that vary with the shocks in the system; the list includes the fiscal impulse component of the government balance and other dependent variables that are likely to be affected by the fiscal impulse. We run regressions in which the vector  $Y$  includes the variables of main interest, similar to the specification in Blanchard and Perotti (2002). The matrix  $C_k$  measures the response of  $Y$  to its  $k$ -period lags. To capture long-term relationships, we introduce the lagged value of the error correction term,  $EC$ , the residual from the co-integration vector that spells out the long-term relationships. The error term  $\varepsilon_{i,t}$  is a vector of error terms reflecting one-period forecast errors of  $Y$ . To contrast variation in the effects of the fiscal impulse based on underlying conditions and macro-specific factors, we will introduce conditioning variables in the VAR.

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<sup>8</sup> For stationarity and cointegration tests, see tables 2 and 3 of the appendix.

**The paper focuses on 34 emerging countries.** They comprise Argentina, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Côte d'Ivoire, Croatia, Ecuador, Egypt, Hungary, India, Indonesia, Israel, Jordan, Korea, Lebanon, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Panama, Peru, the Philippines, Poland, Russia, South Africa, Thailand, Turkey, Ukraine, Uruguay, and Venezuela. We use *annual data*.<sup>9</sup> The cyclically-adjusted measure of government revenue and spending will capture discretionary policies. The discretionary fiscal impulse is pro-cyclical if it weakens during an expansion or strengthens during a downturn, indicating that the headline balance varies beyond merely automatic stabilizers.

### *Hypothesis*

**Higher government spending in countries with inadequate international reserves is likely to increase the interest rates and spreads, reducing the credibility of fiscal policy as it leads to stronger crowding out and decreases private investment.** This could reduce or fully offset the positive effect of the fiscal impulse on growth. Absent crowding out, the increase in government spending in highly open economies would increase imports and widen the current account deficit, creating additional pressures on the limited pool of international reserves. Given capacity limitation in the short-run, higher government spending would increase inflation and increase the real effective exchange rate, decreasing relative competitiveness and further deteriorating the trade balance.

**In contrast, the credibility of fiscal policy increases with reserves availability.**

Government spending is likely to be more effective in countries with adequate international reserves, judged by lower increase in the interest rate and sovereign spread, higher investment growth, higher real growth, and smaller adverse effects on the current account deficit and inflation.

## IV. EMPIRICAL RESULTS

### *Volatility and timing of the Fiscal Impulse*

**Across the sample of emerging countries under investigation, the fiscal impulse is generally pro-cyclical.** Table 1 summarizes the panel regression results. Recall that the dependent variable is the cyclically-adjusted fiscal balance minus the actual fiscal balance. This captures the discretionary component of fiscal policy, having removed cyclicalities in response to automatic stabilizers. An increase in the fiscal impulse indicates fiscal contraction and a decrease indicates fiscal expansion. The independent variable is the output gap and the interactive terms represent conditioning variables that could affect the cyclicalities of the fiscal impulse. An increase in the output gap is consistent with activity expanding faster than potential growth and a decrease captures activity slowing below potential growth. During a boom, when the level of output is above potential, a decrease in the fiscal impulse indicates pro-cyclical expansionary fiscal policies. During a bust, when the level of output falls below potential, the increase in the fiscal impulse indicates pro-cyclical contractionary

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<sup>9</sup> Quarterly data are not available for the sample of emerging countries under investigation. In addition, annual data are less subject to noise that could affect the identification of the fiscal multiplier within a year, using quarterly lags.

fiscal policies. The negative coefficient on the output gap implies that fiscal policies are procyclical on average across the sample of countries under investigation. In contrast, a positive coefficient on the interactive dummy would increase the scope for countercyclical fiscal policies with the specific control variable.

Table 1. Fiscal Impulse Fixed Effects Regression 1/

	Coefficient	Std. Error	t-Statistic	Prob.
Output Gap	-0.003	0.001	-2.625	0.009
D_Reserves*Output Gap 2/	0.003	0.001	2.496	0.013
D_Openness*Output Gap 3/	0.000	0.000	-0.314	0.753
D_Inflation*Output Gap 4/	0.000	0.000	0.078	0.938
D_Debt*Output Gap 5/	0.000	0.000	0.352	0.725
D_Exchange Rate Regime*Output Gap 6/	0.000	0.000	0.759	0.448
C	6.078	0.252	24.156	0.000

1/ The combined coefficient on the output gap (including regime interaction) is negative; this indicates procyclical fiscal policy.

2/ D\_Reserves is a dummy that equals one if reserves in month of imports is three month or more and zero otherwise.

3/ D\_Openness is a dummy that equals one if the ratio of imports and exports to GDP is 50 percent or more and zero otherwise.

4/ D\_Inflation is a dummy that equals one if inflation is equal to or greater than 10 percent and zero otherwise.

5/ D\_Debt is a dummy that equals one if public debt to GDP ratio is equal to or greater than 50 percent or more and zero otherwise.

6/ D\_Exchange Rate Regime is a dummy that equals 1 for fixed, 2 for intermediate, and 3 for floating.

**The availability of international reserves increases the scope of counter-cyclical fiscal policies.** In Table 1, a dummy variable is introduced to condition the pro- or counter-cyclical nature of the fiscal impulse on reserves adequacy, defined as reserves that are equal to or exceed three months of imports.<sup>10</sup> The coefficient on the interactive dummy is positive, implying that the fiscal impulse moves counter-cyclically in countries with high reserves coverage, which increases policy credibility and makes stabilization efforts more affordable.<sup>11</sup>

**The pro- or counter-cyclical nature of the fiscal impulse does not vary with the debt ratio, the exchange rate system, the degree of openness or inflation.** In Table 1, the degree of openness is defined as the share of imports and exports that equals to or exceeds 50 percent of GDP. The coefficient on the interactive dummy is insignificant. Similarly, interactive dummies that capture a high debt ratio to GDP (50 percent or above), high inflation (ten percent or above), or the exchange rate regime are insignificant. This suggests

<sup>10</sup> International reserves are used as a proxy for available resources that increases the scope of monetary policy to accommodate expansionary fiscal policies. Of course, other resources (e.g., Savings and Stabilization Funds in countries with non-renewable resources) could provide additional cushion to increase the credibility of an expansionary fiscal stance. Data are not available to capture the direct effect of these savings on the fiscal impulse. However, one would expect that these savings would further reinforce the effect of reserves availability to enhance the policy credibility and increase the scope for counter-cyclical fiscal policies.

<sup>11</sup> The evidence is robust in a modification that employs continuous interactive variables with the output gap, instead of the discrete dummy variables. For this modification, the model is estimated using Generalized Method of Moments to account for the endogeneity of right-hand side variables using instrumental variables. Accordingly, the fiscal impulse moves pro-cyclically with the output gap and the scope for countercyclical policies increases with reserves availability.

that the pro-cyclical fiscal impulse does not vary significantly with openness, inflation, the exchange rate system, or the debt burden across countries.

### *Effectiveness of Fiscal Policy*

**In the long run, the fiscal impulse is neutral on output growth.** The model specification tests this hypothesis using the coefficients of the cointegrated vector. Table 2 summarizes the results of the vector auto-regression that measures variation in output growth with the fiscal impulse, broad money growth, and real exchange rate appreciation in the long- and short-run.<sup>12</sup> As we are interested in measuring the effectiveness of the fiscal impulse, we will focus on movement in output growth with variables in the cointegrated vector, including the fiscal impulse, in the long-run and with lagged variables in the error correction model in the short-run.<sup>13</sup> The fiscal impulse has a negative impact on output growth in the long-run, implying a discretionary fiscal expansion (a reduction in the fiscal impulse) increases output growth but the relationship is insignificant. Exchange rate appreciation has a negative and significant impact on output growth, implying persistent appreciation decreases competitiveness and erodes the export base and, therefore, shrinks output growth in the long-run. Broad money growth stimulates output growth significantly in the long-run by providing liquidity in support of investment and productive capacity, increasing potential output.<sup>14</sup>

**In the short run, contractionary fiscal policy could stimulate growth.** In contrast to the long-run evidence, the response of output growth to the lagged fiscal impulse is positive and significant in the short-run. This suggests that contractionary fiscal policy (an increase in the fiscal impulse) stimulates output growth and vice versa.<sup>15</sup> Higher fiscal spending, absent adequate resources, requires borrowing that could counter effectiveness and the credibility of the stimulus as it crowds out private activity and/or raises concerns about fiscal sustainability. On average, the evidence across the sample of 34 emerging countries under investigation indicates conditions that pertain to high debt ratio and high cost of borrowing could erode confidence in policy credibility and raise sustainability concerns, countering the effectiveness of the expansionary fiscal stance in the short-run (see the impulse response function in Figure 1 of the appendix).

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<sup>12</sup> Using quarterly data for OECD countries, Blanchard and Perotti (2002) point out the problem of identifying the output reaction to fiscal expansion. Quarterly data are not available for the sample of emerging countries under investigation. To address reverse causality using annual data, we introduce explanatory variables in the model to identify the output reaction to fiscal expansion, controlling for other variables that could also determine fiscal policy.

<sup>13</sup> The interested reader could trace variation in the fiscal response with other variables in the long and short-run, available in Table 2. All variables are assumed to be cointegrated in the long-run and vary with exogenous shocks in the short-run.

<sup>14</sup> Higher monetary growth may cause inflation and an appreciation of the real exchange rate, which could be detrimental to real growth. The evidence discounts the importance of this channel relative to the effect of monetary growth in supporting investment and productive capacity. The result attests to the success of relaxing financial repression, increasing the effectiveness of monetary policy via the intermediation process in support of higher growth.

<sup>15</sup> There is a body of research that shows that in certain circumstances contractionary fiscal policy can be expansionary, see, e.g., FAD Pamphlet No. 55, and Kandil (2009, 2006a, b, and 2005).

Table 2. Panel Vector Error Correction Estimates 1/

Table 2. Panel Vector Error Correction Estimates 1/				
<b>Long Run Equation:</b>				
<i>Growth</i> (-1)	1			
<i>Fiscal Impulse</i> (-1)	1.2274 (2.7361) [ 0.44858]			
<i>Dlog</i> (REER(-1))	4746.6340 (332.2020) [ 14.2884]			
<i>Dlog</i> (BM(-1))	-550.9945 (216.3160) [-2.54718]			
C	67.2131			
Adjustment Coefficient	-0.0040 (0.0006) [-7.10266]			
<b>Short Run Dynamic:</b>				
	<i>Growth</i>	<i>Fiscal Impulse</i>	<i>Dlog</i> (REER)	<i>Dlog</i> (BM)
<i>D</i> ( <i>Growth</i> (-1))	-0.369 -0.046 [-7.93713]	-0.044 -0.044 [-0.99985]	-0.001 -0.001 [-0.71420]	0.003 -0.001 [ 2.56776]
<i>D</i> ( <i>Growth</i> (-2))	-0.345 -0.043 [-8.01163]	-0.068 -0.041 [-1.67164]	0.000 -0.001 [ 0.34971]	0.002 -0.001 [ 2.02300]
<i>D</i> ( <i>Fiscal Impulse</i> (-1))	-0.026 -0.051 [-0.50191]	-0.493 -0.049 [-10.1581]	-0.001 -0.002 [-0.81171]	0.003 -0.001 [ 2.15168]
<i>D</i> ( <i>Fiscal Impulse</i> (-2))	0.133 -0.041 [ 3.24175]	-0.262 -0.039 [-6.67487]	-0.003 -0.001 [-2.18994]	0.000 -0.001 [ 0.42751]
<i>D</i> ( <i>Dlog</i> (REER(-1)))	9.945 -2.223 [ 4.47371]	-2.391 -2.116 [-1.12985]	0.101 -0.071 [ 1.42839]	-0.144 -0.062 [-2.30195]
<i>D</i> ( <i>Dlog</i> (REER(-2)))	4.954 -1.636 [ 3.02786]	2.137 -1.558 [ 1.37216]	0.049 -0.052 [ 0.94650]	-0.077 -0.046 [-1.67089]
<i>D</i> ( <i>Dlog</i> (BM(-1)))	5.918 -1.959 [ 3.02088]	2.266 -1.865 [ 1.21507]	0.055 -0.063 [ 0.88440]	-0.532 -0.055 [-9.67385]
<i>D</i> ( <i>Dlog</i> (BM(-2)))	-2.166 -1.975 [-1.09660]	0.825 -1.880 [ 0.43869]	0.068 -0.063 [ 1.07510]	-0.200 -0.055 [-3.60344]
C	-1.763 -0.696 [-2.53253]	-0.429 -0.663 [-0.64787]	-0.036 -0.022 [-1.61769]	-0.051 -0.020 [-2.60163]
World Growth	0.564 -0.169 [ 3.32920]	0.150 -0.161 [ 0.92765]	0.011 -0.005 [ 1.98490]	0.011 -0.005 [ 2.40252]
R-squared	0.438	0.362	0.570	0.274
Adj. R-squared	0.421	0.343	0.557	0.252
Sum sq. resids	3030.034	2745.796	3.084	2.386
S.E. equation	3.035	2.889	0.097	0.085
F-statistic	25.619	18.697	43.568	12.426
Log likelihood	-854.294	-837.549	317.015	360.664
Akaike AIC	5.090	4.991	-1.800	-2.057
Schwarz SC	5.214	5.115	-1.676	-1.933
Mean dependent	0.317	0.024	0.005	0.000
S.D. dependent	3.987	3.564	0.145	0.098
Sources: IMF International Financial Statistics; World Economic Outlook; Regional Economic Outlook.				
1/ Standard errors in ( ) and t-statistics in [ ]. BM is broad money and REER is real effective exchange rate.				

**Real growth responds positively to exchange rate appreciation and monetary growth in the short-run.** Exchange rate appreciation, in contrast to the long-run evidence, stimulates output growth in the short-run. Appreciation decreases the cost of imported inputs which has a positive and persistent effect on the output supply in the short-run. Cheaper cost of intermediate imports increases the capacity to produce and expand the output supply.<sup>16</sup> This finding indicates that, on average, the short-run reduction in the cost of intermediate imports in response to an appreciation shock leads to expansion of the output supply, which counters the negative effect on export competitiveness and export growth. Higher monetary growth, consistent with the long-run evidence, stimulates output growth in the short-run.<sup>17</sup> However, persistent monetary growth in the short-run, without a matching increase in productive capacity, may increase inflationary expectations and counter the effectiveness of monetary policy, as evident by the insignificant response of output growth to two-year lagged monetary growth (see the impulse response function in Figure 1 of the appendix). Additionally, real growth in the panel of small open economies is highly dependent on fluctuations in the global economy, as evident by the significant contemporaneous response to world growth.

*Conditions for Fiscal Effectiveness: Reserves Availability*

**Reserves availability does not alter the neutrality of the fiscal stimulus on output growth in the long-run.** In Table 3, column 1, we introduce an interactive dummy to capture the effect of reserves adequacy, higher than three months of imports, on the effects of the fiscal stimulus on output growth. In the long-run, the coefficient on the interactive dummy is insignificant, further affirming the neutral effects of a fiscal stimulus on output growth in the long run, regardless of reserves availability.

**Reserves availability increases the effectiveness of the fiscal stimulus in the short-run.** The interactive dummy on the first-lag of the fiscal impulse is negative and significant in the short-run. Countries with adequate international reserves are able to increase policy credibility and the effectiveness of the fiscal stimulus in the short-run where expansionary fiscal policy (a reduction in the fiscal impulse) stimulates output growth. This channel appears to be persistent over time, as evident by the impulse response function in the appendix. Accordingly, the combined response of output growth to the lagged fiscal impulse, including the interactive dummy, is negative. The implication is that an expansionary fiscal impulse is more credible to stimulate output growth in the short-run in countries with adequate international reserves coverage.

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<sup>16</sup> As illustrated in Kandil and Mirzaie (2002), there are two channels through which unanticipated exchange rate shocks impact on economic activity in the short-run. On one hand, unanticipated appreciation decreases competitiveness and net demand for exports. However, in countries where output supply is highly dependent on imported inputs, unanticipated appreciation, by decreasing the cost of imports, stimulates output growth. The net positive effect in the short-run indicates a more dominant effect for the supply-side channel in determining adjustment in output growth in response to short-term exchange rate appreciation.

<sup>17</sup> The allocation of monetary growth between output growth and price inflation depends on the slope of the short-run supply curve which reflects structural and institutional constraints.

<b>Table 3. Panel Vector Error Correction Estimates 1/</b>					
	<b>With Reserve Dummy</b>	<b>With Inflation Dummy</b>	<b>With Debt Dummy</b>	<b>With Exchange Regime Dummy</b>	<b>With Openness Dummy</b>
<b>Long Run Equation:</b>					
<i>Growth(-1)</i>	1	1	1	1	1
<i>Fiscal Impulse(-1)</i>	0.193 (0.889) [ 0.21699]	-0.049 (0.038) [-1.28714]	0.947 (0.659) [ 1.43809]	-0.135 (0.117) [-1.15465]	1.166 (0.874) [ 1.33502]
<i>D(-1)*Fiscal Impulse(-1)</i>	0.163 (1.031) [ 0.15849]	0.084 (0.054) [ 1.54097]	-2.907 (0.942) [-3.08588]	0.081 (0.056) [ 1.45257]	-1.181 (0.893) [-1.32261]
<i>Dlog(REER(-1))</i>	1081.099 (76.703) [ 14.0945]		993.461 (90.275) [ 11.0048]		880.194 (62.698) [ 14.0387]
<i>Dlog(BM(-1))</i>	-137.105 (49.970) [-2.74376]	1.335 (0.685) [ 1.95025]	-171.946 (67.340) [-2.55341]	0.789 (0.696) [ 1.13457]	-105.287 (40.458) [-2.60236]
C	13.231	-4.489	15.311	-4.395	8.428
Adjustment Coefficient	-0.019 (0.003) [-7.51727]	-0.827 (0.046) [-17.8351]	-0.013 (0.003) [-4.52578]	-0.726 (0.048) [-15.1293]	-0.023 (0.003) [-7.54988]
<b>Short Run Dynamic:</b>					
	<i>Growth</i>	<i>Growth</i>	<i>Growth</i>	<i>Growth</i>	<i>Growth</i>
<i>D(Growth(-1))</i>	-0.365 (0.046) [-7.85172]	0.052 (0.039) [ 1.33595]	-0.369 (0.052) [-7.04315]	0.103 (0.041) [ 2.49840]	-0.347 (0.047) [-7.41278]
<i>D(Growth(-2))</i>	-0.338 (0.043) [-7.82187]	-0.004 (0.030) [-0.13831]	-0.303 (0.046) [-6.55225]	-0.017 (0.035) [-0.47512]	-0.341 (0.043) [-7.97798]
<i>D(Fiscal Impulse(-1))</i>	0.056 (0.072) [ 0.77880]	-0.154 (0.044) [-3.53089]	-0.014 (0.071) [-0.19145]	-0.035 (0.119) [-0.29734]	-0.038 (0.080) [-0.46903]
<i>D(Fiscal Impulse(-2))</i>	0.138 (0.054) [ 2.56160]	-0.115 (0.044) [-2.63148]	-0.067 (0.066) [-1.01971]	-0.068 (0.110) [-0.62128]	0.189 (0.069) [ 2.74468]
<i>D(D(-1)*Fiscal Impulse(-1))</i>	-0.099 (0.060) [-1.65847]	0.155 (0.043) [ 3.64592]	0.008 (0.055) [ 0.13779]	0.028 (0.060) [ 0.47540]	-0.003 (0.093) [-0.02740]
<i>D(D(-2)*Fiscal Impulse(-2))</i>	-0.026 (0.052) [-0.50282]	0.102 (0.043) [ 2.37246]	0.071 (0.052) [ 1.36511]	0.053 (0.056) [ 0.95287]	-0.110 (0.079) [-1.38745]
<i>D(Dlog(REER(-1)))</i>	11.133 (2.278) [ 4.88821]		3.771 (2.337) [ 1.61356]		10.371 (2.218) [ 4.67610]
<i>D(Dlog(REER(-2)))</i>	5.383 (1.664) [ 3.23502]		2.214 (1.853) [ 1.19442]		4.949 (1.643) [ 3.01281]
<i>D(Dlog(BM(-1)))</i>	5.513 (1.974) [ 2.79295]	1.166 (0.719) [ 1.62229]	5.529 (2.214) [ 2.49664]	0.911 (0.735) [ 1.23958]	5.376 (1.962) [ 2.74065]
<i>D(Dlog(BM(-2)))</i>	-2.474 (1.997) [-1.23899]	-0.675 (0.742) [-0.90994]	-3.466 (2.085) [-1.66221]	-0.492 (0.725) [-0.67816]	-1.848 (1.974) [-0.93615]
C	-1.731 (0.702) [-2.46565]	-2.016 (0.624) [-3.23034]	-1.526 (0.631) [-2.41857]	-2.424 (0.679) [-3.57129]	-1.899 (0.695) [-2.73282]
World Growth	0.559 (0.170) [ 3.28070]	0.595 (0.165) [ 3.59883]	0.486 (0.153) [ 3.18804]	0.732 (0.184) [ 3.97630]	0.599 (0.169) [ 3.53547]
R-squared	0.448	0.416	0.366	0.364	0.449
Adj. R-squared	0.428	0.410	0.337	0.355	0.429
Sum sq. resids	2962.180	33617.340	1611.014	18890.130	2968.906
S.E. equation	3.033	5.949	2.456	5.195	3.013
F-statistic	21.801	67.679	12.822	40.047	22.217
Log likelihood	-840.419	-3071.692	-642.279	-2174.807	-850.830
Akaike AIC	5.095	6.416	4.681	6.149	5.081
Schwarz SC	5.243	6.471	4.849	6.219	5.228
Mean dependent	0.335	0.063	0.210	0.181	0.317
S.D. dependent	4.009	7.744	3.017	6.467	3.987
Sources: IMF International Financial Statistics; World Economic Outlook; Regional Economic Outlook.					
1/ Standard errors in ( ) and t-statistics in [ ]. BM is broad money, and REER is real effective exchange rate. Reserve dummy equals one if reserves in month of imports is three month or more and zero otherwise. Inflation dummy equals one if inflation is equal to or greater than 10 percent and zero otherwise. Debt dummy equals one if public debt to GDP ratio is equal to or greater than 50 percent or more and zero otherwise. Exchange rate regime dummy equals 1 for fixed, 2 for intermediate, and 3 for floating. Openness dummy equals one if the ratio of imports and exports to GDP is 50 percent or more and zero otherwise.					

Reserves availability increases policy credibility and the effectiveness of the fiscal impulse by reducing concerns about financing and mitigating potential adverse effects on the cost of borrowing and the crowding out of private activity.<sup>18</sup>

**Having controlled for reserves availability, other determinants of growth are robust.**

Exchange rate appreciation, by decreasing the cost of imported inputs, has a positive effect on output growth in the short run. Moreover, broad money growth facilitates real growth in the short-run, although persistent broad money growth may lose effectiveness over time. The spillover positive effect from global growth is an important determinant of real growth in the panel.

*Conditions for Fiscal Effectiveness: Inflation*

**The inflationary environment does not affect the neutrality of the fiscal impulse in the long-run.** In Table 3, column 2, we introduce an interactive dummy to condition the effectiveness of the fiscal impulse on output growth in the long run, based on the inflationary environment (above or equal to 10 percent).<sup>19</sup> The coefficient on the interactive dummy is insignificant in the long-run.

**High inflation counters policy credibility and the effectiveness of the fiscal impulse on output growth in the short-run.** Introducing an interactive dummy variable for high inflation in the short-run, the response of output growth to the first and second lags is positive and significant. The implication is that output growth declines with expansionary fiscal policy (a reduction in the fiscal impulse) in a high inflationary environment. Fiscal expansion increases inflationary expectations and raises the cost of credit, countering policy credibility and the effectiveness of the stimulus impulse in the short-run. Moreover, in the remainder of the sample (lower inflationary environments), the response of output growth to the first and second lags of the fiscal impulse is negative and significant. The implication is that fiscal policy is effective in low inflationary environments. An expansionary fiscal impulse increases output growth significantly over time. Underlying this evidence is higher policy credibility, reflecting the lower cost of borrowing as government spending is more growth inducing in a low inflationary environment. The expansionary effects of exchange rate appreciation and broad money growth on output growth are robust in the short-run.

*Conditions for Fiscal Effectiveness: Debt Burden*

**The fiscal impulse has a long lasting negative effect on real growth where the debt burden is high.** In Table 3, column 3, we introduce an interactive dummy on the fiscal impulse that captures yet a third constraint on the effectiveness of fiscal policy, high debt ratios (above or equal to 50 percent of GDP). The coefficient on the interactive dummy is

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<sup>18</sup> The evidence is robust to a change in the benchmark of reserves adequacy to four months coverage of imports.

<sup>19</sup> To secure cointegration, we drop the real effective exchange rate from the cointegrating vector in light of its high correlation with inflation.

positive and significant in the long-run. The implication is that an expansionary fiscal policy (a reduction in the fiscal impulse) has a negative effect on output growth in the long-run in countries with high initial debt levels. Higher spending that is financed by borrowing reduces policy credibility and increases the cost of borrowing and the debt ratio, countering the effectiveness of the stimulus. Rising concerns about the cost of debt service and debt sustainability crowds out private activity with long-lasting negative effects on growth in the long-run. In the short-run, however, the effectiveness of the fiscal impulse does not vary between countries with high versus low debt levels. The remaining coefficients in the regression are robust in the short and long-term with respect to the introduction of the interactive dummy for high debt ratio on the fiscal impulse.

*Conditions for Fiscal Effectiveness: Exchange Rate System*

**The effectiveness of the fiscal impulse does not vary with the exchange rate system in the short- and long-run.** The “conventional wisdom” is becoming that the response of exchange rate to fiscal expansion is crucial to evaluate multipliers.<sup>20</sup> In Table 3, column 4, we introduce an interactive dummy variable on the fiscal impulse that captures a de-facto fixed exchange rate system. The results suggest that the effectiveness of the fiscal impulse on real growth is not altered by the exchange rate system. In contrast to theory’s expectations, countries with a fixed exchange rate system do not seem to enhance the effectiveness of their fiscal policy.<sup>21</sup> One explanation relates to the previous results demonstrating the negative effect of higher inflation on the effectiveness of fiscal policy. While a fixed exchange rate system forestalls a nominal appreciation in the face of expansionary fiscal policy, the resulting inflation would have a counter effect on competitiveness through its impact on the real exchange rate. The insignificant results of the interactive dummies indicate that for fiscal stimulus to be effective under a fixed exchange rate system, the authorities would need to curb inflation and preserve competitiveness.

*Conditions for Fiscal Effectiveness: Openness*

**The effectiveness of the fiscal impulse in the short- and long-run does not vary with the degree of openness.** In Table 3, column 5, we introduce an interactive dummy on the fiscal impulse that captures a high degree of openness (above or equal to 50 percent). The effectiveness of fiscal policy does not vary significantly in a more open economy. While more openness increases demand for imports and dampens the effectiveness of fiscal policy, higher quality government spending that targets capacity constraints and structural bottlenecks may stimulate exports. As both channels work in opposite directions on real growth, the evidence does not appear to be conclusive regarding significant variation in the

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<sup>20</sup> See, e.g., Woodford (2010) and Christiano, Eichenbaum and Rebelo (2009). Our findings that the pegged exchange rate system does not enhance the effectiveness of fiscal policy in emerging markets provide further support to this literature.

<sup>21</sup> This is consistent with the findings in IMF (2009b). As suggested by Milesi-Feretti (1996), flexible exchange rate systems may enforce a higher degree of discipline on fiscal management, containing inflationary expectations and enhancing policy credibility and, therefore, the effectiveness of fiscal stimulus on real growth.

effectiveness of the fiscal stimulus with the degree of openness. Other coefficients remain robust in the short- and long-run in this model specification.

## V. CONCLUSIONS

**Across a sample of thirty four emerging countries, the evidence suggests that fiscal policy in practice tends to be pro-cyclical.** The cyclically-adjusted fiscal balance decreases relative to actual, implying stronger fiscal impulse, on average, during expansions and a weaker impulse during downturns. During expansions, government spending increases relative to budgetary revenues, providing additional fiscal stimulus that may increase the risk of overheating, absent efforts to target government spending towards relaxing capacity constraints and structural bottlenecks. During contractions, government spending shrinks in response to inadequate budgetary resources, further exacerbating economic downturns and hampering recovery efforts.

**The scope of counter-cyclical policies increases where international reserves are adequate.** Indeed, where international reserves coverage exceeds three months of imports, the fiscal impulse can be counter-cyclical, indicating more fiscal efforts to stabilize the cycles. Reserves availability increases policy credibility as it relaxes financing constraints, increasing the possibility to implement a fiscal stimulus during downturns, without the risk of depleting limited reserves and jeopardizing external stability. In contrast, the degree of openness of the economy, rate of inflation, the debt ratio, or the exchange rate system do not appear to limit or support the pro-cyclical stance of fiscal policy. While fiscal space increases with reserves availability, other factors appear less relevant.

**Reserves availability increases credibility and the effectiveness of fiscal policy.** Fiscal policy is neutral in the long-run, indicating no significant effect of the fiscal impulse on capacity building. However, in the short run, where reserves are less than three months of imports, fiscal expansion tends to increase the cost of borrowing and debt service, crowding out private activity with a negative net effect on output growth. If international reserves are adequate; resource availability increases policy credibility and mitigates these concerns about fiscal expansion, which enhances the effectiveness of the fiscal stimulus on output growth in the short-run.

**High inflation decreases policy credibility and counters the effectiveness of fiscal stimulus in the short-run.** Where inflation exceeds ten percent, expansionary fiscal policy further crowds out private activity with more pronounced contraction in real growth. Higher fiscal spending in a high inflationary environment increases inflationary expectations and the cost of borrowing, hampering policy credibility and the short-run effectiveness of the fiscal stimulus.

**Fiscal expansion has a long-lasting negative effect on real growth where the debt burden is high.** Mounting debt burden relative to GDP decreases policy credibility and increases concerns about debt sustainability and debt service obligations. Accordingly, persistent fiscal expansion under these circumstances crowds out private resources and decreases incentives for private activity, with negative effects on real growth in the long-run.

**There is no evidence of variation in the effectiveness of the fiscal stimulus with the exchange rate system or the degree of openness.** While a de-facto pegged exchange rate system limits appreciation in the face of fiscal expansion, high inflation mitigates the positive effect on competitiveness, limiting the effectiveness of the fiscal stimulus. In more open economies, an increase in imports in the face of fiscal expansion reduces the effectiveness of the stimulus. However, higher capital spending by the government may prove effective in relaxing capacity constraints and easing structural bottlenecks to promote export growth.

**The evidence reaffirms concerns about policy credibility and the effectiveness of the fiscal stimulus where international reserves are not adequate.** While fiscal spending should be prioritized to increase growth and limit inflationary pressures, the effectiveness of the fiscal stimulus depends on the perceived credibility and the availability of resources to finance private activity while ensuring debt sustainability. Countries that have accumulated a cushion of international reserves are in a more comfortable position to adopt the necessary stimulus to weather external shocks and counter the effects of the global slowdown on domestic activity. In contrast, where reserves availability appears to be critical, limited options are available for credible fiscal stimulus, including mobilizing additional revenues or prioritizing spending and/or securing affordable financing. Constraints on these options, amidst concerns about mounting debt burden and increased external vulnerability, may necessitate, however, limited scope for credible and effective counter-cyclical fiscal policy.

## VI. APPENDIX

The fiscal impulse measure used for the regressions is constructed as the difference between a hypothetical overall fiscal deficit in period  $t$ , assuming no changes in the economic environment, and the actual fiscal deficit in period  $t-1$ . As a first step, note that the actual overall fiscal balance in period  $t$  can be expressed as a function of the discretionary policies,  $P_t$ , and the economic environment prevailing in that period,  $E_t$ :

$$B_t = B(P_t, E_t).$$

The change in the overall balance *with respect to the previous year* can then be decomposed as follows:

$$\begin{aligned} \Delta B_t &= B(P_t, E_t) - B(P_{t-1}, E_{t-1}) \\ &= [B(P_t, E_t) - B(P_t, E_{t-1})] + [B(P_t, E_{t-1}) - B(P_{t-1}, E_{t-1})] \\ &= \Delta B_t^E + \Delta B_t^P. \end{aligned}$$

The term  $B(P_t, E_{t-1})$  captures what the overall fiscal balance would have been under the period  $t$  policies, assuming the economic environment was the same as in period  $t-1$ . This is the cyclically adjusted balance.

It is then possible to break the change in the balance into two elements. The first element,  $\Delta B_t^E$ , represents the fiscal effects of changes in the economic environment from  $E_{t-1}$  to  $E_t$  (*the change in the cyclical part of the balance*). The second element,  $\Delta B_t^P$ , captures the change in the balance as a result of changes in discretionary policies (*the change in the structural part of the deficit, or the fiscal impulse*).

In practice, the initial step for calculating the regression-based measure of fiscal impulse is to estimate the following equations, assuming real GDP growth is a good proxy for the economic environment:

$$\begin{aligned} R_t &= \alpha_R + \beta_R \cdot growth_t + \gamma_R \cdot trend_t + u_t \\ G_t &= \alpha_E + \beta_E \cdot growth_t + \gamma_E \cdot trend_t + e_t, \end{aligned}$$

where  $R$  is general government revenue in percent of GDP,  $G$  is general government expenditure in percent of GDP,  $growth$  is real GDP growth,  $trend$  is a time trend, and  $u$  and  $e$  are residuals.

The growth-adjusted revenue, which indicates what the revenue *would* have been in period  $t$  if the growth rate remained unchanged from the previous period, is computed as  $R_t(growth_{t-1}) = \hat{\alpha}_R + \hat{\beta}_R \cdot growth_{t-1} + \hat{\gamma}_R \cdot trend_t + \hat{u}_t$ .

The growth-adjusted expenditure is computed in the same way, as

$$G_t(growth_{t-1}) = \hat{\alpha}_E + \hat{\beta}_E \cdot growth_{t-1} + \hat{\gamma}_E \cdot trend_t + \hat{e}_t$$

The measure for the overall balance that would have prevailed in period  $t$  if the growth rate had been equal to that in period  $t - 1$ ,  $B(P_t, E_{t-1})$ , can then be calculated as  $R_t(\text{growth}_{t-1})$  minus  $E_t(\text{growth}_{t-1})$ . The actual fiscal balance in the previous period,  $B(P_{t-1}, E_{t-1})$ , is simply  $R_{t-1} - G_{t-1}$ .

The final step in the construction of the fiscal impulse measure is to take the difference between the growth-adjusted measure for the overall balance in period  $t$  and the fiscal balance in the previous period:

$$\begin{aligned} \text{Fiscal impulse}_t &= [R_t(\text{growth}_{t-1}) - G_t(\text{growth}_{t-1})] - [R_{t-1} - G_{t-1}] \\ &= (\hat{\gamma}_R - \hat{\gamma}_E) + (\hat{u}_t - \hat{u}_{t-1}) - (\hat{e}_t - \hat{e}_{t-1}). \end{aligned}$$

Note that although  $\hat{u}_t$  and  $\hat{e}_t$  can be expected to be uncorrelated with  $y_t$ ,  $\hat{u}_{t-1}$  and  $\hat{e}_{t-1}$  are correlated with  $y_t$ .

**Table A1. Length of Time Series by Country for Annual Data**

For Real GDP and Government Balance Series

<b>Country</b>	<b>Beginning Date</b>	<b>End Date</b>
Argentina	1963	2008
Brazil	1980	2008
Bulgaria	1981	2008
Chile	1979	2008
China	1963	2008
Colombia	1979	2008
Costa Rica	1963	2008
Cote d'Ivoire	1981	2008
Croatia	1963	2008
Ecuador	1979	2008
Egypt	1963	2008
Hungary	1963	2008
India	1979	2008
Indonesia	1975	2008
Israel	1980	2008
Jordan	1963	2008
Korea	1979	2008
Lebanon	1963	2008
Malaysia	1962	2008
Mexico	1963	2008
Morocco	1963	2008
Nigeria	1979	2008
Pakistan	1963	2008
Panama	1963	2008
Peru	1963	2008
Philippines	1963	2008
Poland	1981	2008
Russia	1950	2008
South Africa	1980	2008
Thailand	1963	2008
Turkey	1979	2008
Ukraine	1979	2008
Uruguay	1986	2008
Venezuela	1988	2008

Source: International Monetary Fund, WEO

Figure A1. Summary Charts for Dummy Variables

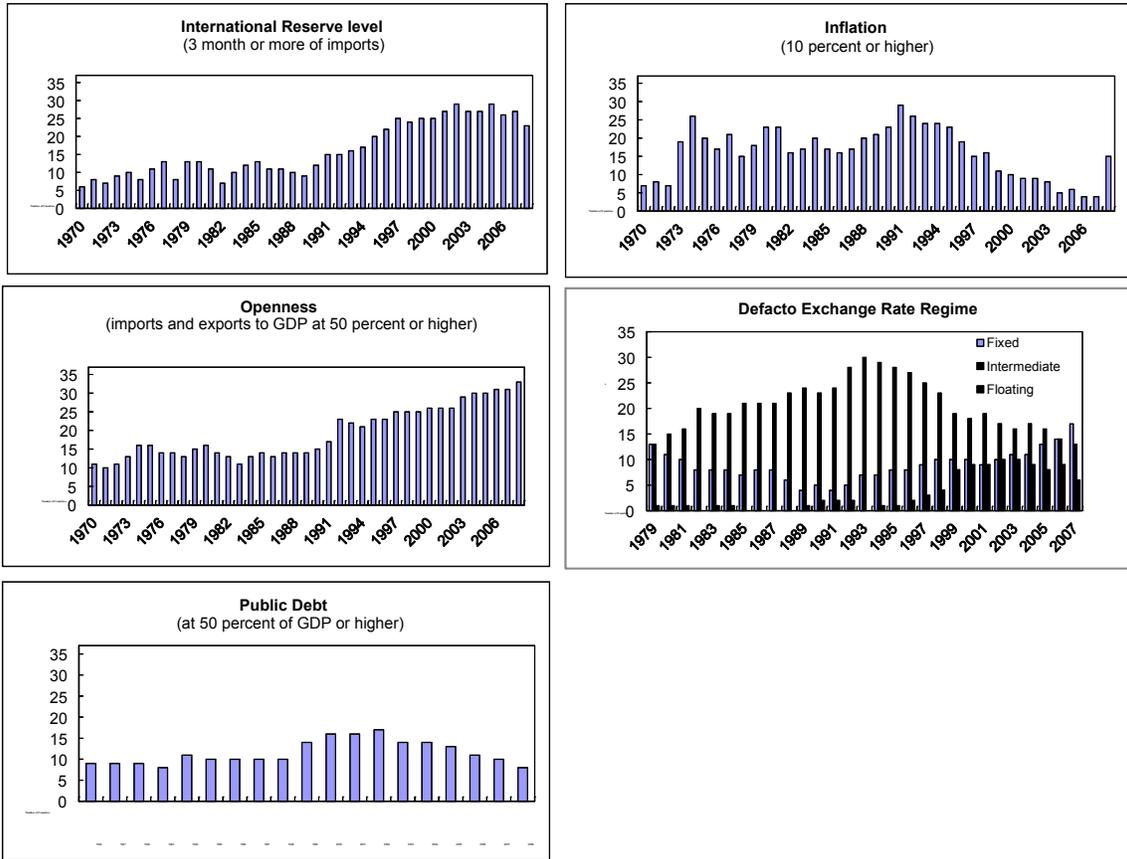


Table A2. Panel Unit Root Test 1/

	Statistic	Probability
Log(RGDP)	2.107	0.982
Fis_Impl_lvl	3.240	0.999
log(REER)	1.114	0.867
log(BM)	3.060	0.999

Note: Tests are implemented with a constant and trend in the test regression. The lags in the error correction test are chosen according to the Akaike criterion. Unit roots are examined via the ADF\_Fisher Chi-square test. All unit root tests take a unit root as the null hypothesis.

1/ RGDP is real GDP, Fis\_Impl\_lvl is the level of fiscal impulse (rather than a ratio to GDP), BM is broad money, and REER is real effective exchange rate.

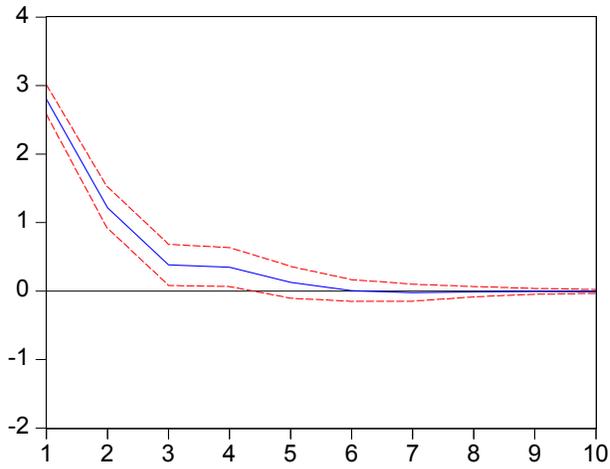
Table A3. Johansen Fisher Panel Cointegration Test

Rank null hypothesis	Trace Statistic	Probability 1/
None	313.2	0
At most 1	225.1	0
At most 2	68.1	0.0005
At most 3	37.53	0.3103

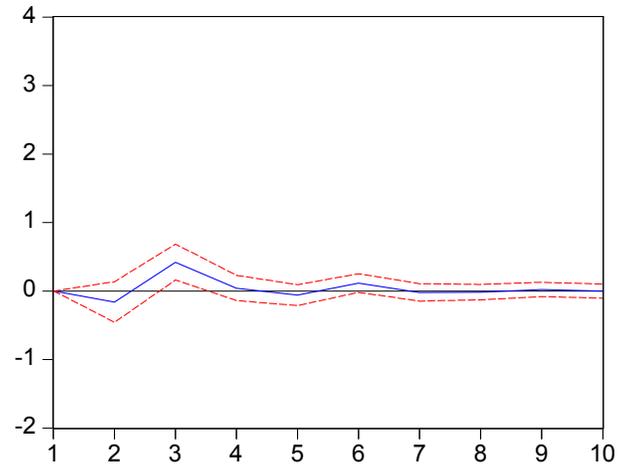
1/ Probabilities are computed using asymptotic Chi-square distribution.

Response to Cholesky One S.D. Innovations  $\pm 2$  S.E.

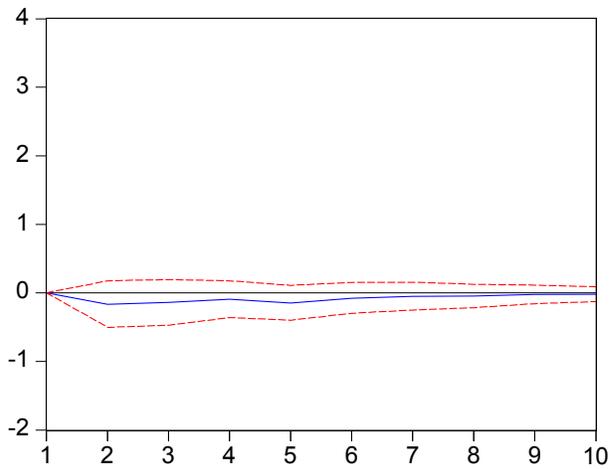
Response of GROWTH to GROWTH



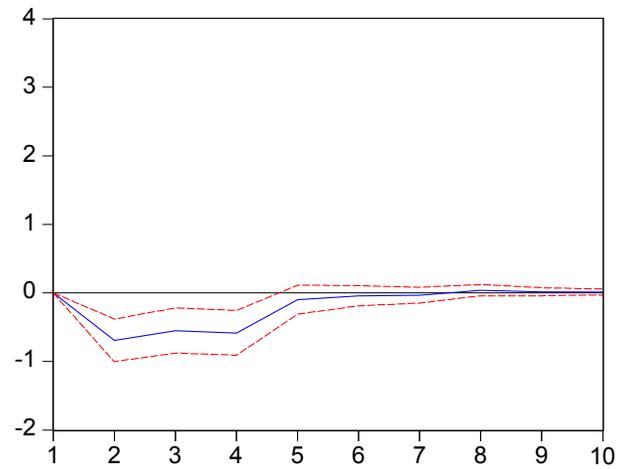
Response of GROWTH to FISC\_IMPLS



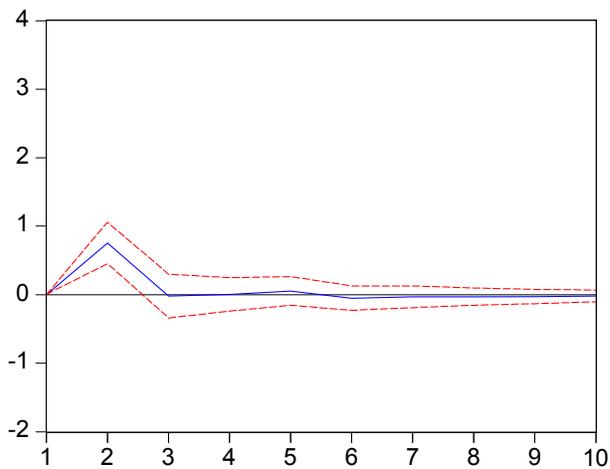
Response of GROWTH to D\_RSRV\*FISC\_IMPLS



Response of GROWTH to DLOG(REER)



Response of GROWTH to DLOG(BM)



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