

## ADB Economics Working Paper Series



### Fiscal Sustainability in Developing Asia

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Charles Adams, Benno Ferrarini, and Donghyun Park

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**Charles Adams, Benno Ferrarini, and Donghyun Park**

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## **Contents**

Abstract	v
I. Introduction	1
II. Conceptual Review of Fiscal Sustainability	4
III. Fiscal Diagnostics: Evolution of Key Fiscal Indicators across Asia over Time	13
IV. Econometric Tests of Primary Fiscal Balance Response Functions	26
V. Fiscal Stimulus Scenarios	30
VI. Medium-Term Fiscal Policy Frameworks	32
VII. Concluding Observations	35
Selected References	38



## **Abstract**

The central objective of this paper is to empirically examine the issue of fiscal sustainability in developing Asia. To do so, we first diagnose the region's public finances by analyzing the evolution of key fiscal indicators over time and across subregions. We then estimate fiscal policy response functions that measure the adjustment of the primary fiscal balance to public debt positions. Overall, our results indicate that the region's public finances are in good shape as a result of responsible fiscal behavior. Nevertheless, failure to withdraw the region's anticrisis fiscal stimulus in a timely manner may jeopardize fiscal sustainability, bolstering the case for strong medium-term fiscal policy frameworks.



## I. Introduction

In response to the pronounced impact of the global financial and economic crisis on trade and growth, which reached its climax in the second half of 2008 and the first half of 2009, developing Asia (henceforth Asia) has boldly, decisively, and quickly unleashed sizable fiscal stimulus packages.<sup>1</sup> For the most part, those packages have been skewed toward additional spending, in particular on infrastructure investments, rather than tax cuts. While the People's Republic of China's (PRC) US\$586 or Yuan 4 trillion stimulus is the most highly publicized example of Asia's new-found penchant for fiscal activism, governments across the region have aggressively boosted expenditures and slashed taxes to support growth in the wake of the global crisis. Asia's fiscal activism represents an unprecedented response to an unprecedented crisis. Unprecedented because never before has there been such a systematic, synchronized, and across-the-board fiscal expansion even though the relative magnitude and composition of the stimulus packages varies widely across the region. The regionwide activist countercyclical response was borne out of sheer necessity in a situation in which plunging exports combined with limp private domestic demand to create a gaping vacuum in aggregate demand.

There is fairly widespread but unsubstantiated belief that the region's anticrisis countercyclical fiscal policies have "worked" and helped the region weather the crisis. It is too early to tell whether the region's postcrisis recovery can be sustained. However, what is certain is that the speed and strength of the region's recovery has exceeded all expectations. What makes the region's spectacular V-shaped recovery all the more remarkable is that it is taking place against the backdrop of a modest and fragile recovery in the G3. The combination of two striking stylized facts of Asia's postcrisis economic landscape, i.e., unexpectedly robust recovery and regionwide fiscal expansion, have led many to attribute the recovery to the fiscal expansion, almost by default. It is true that governments across the region have also pursued monetary expansion, but the impact of monetary policy is less immediate and direct than that of fiscal policy, especially government spending. Furthermore, it is uncertain how firms and consumers respond to lower interest rates in a state of depressed confidence, which characterizes crisis periods. It is premature to gauge the exact contribution of the fiscal stimulus to Asia's recovery, and there were clearly a number of other contributory factors, including the relatively healthy state of the region's financial systems. Nevertheless, there is a popular perception that the region's fiscal stimulus made a vital contribution to the region's recovery.

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<sup>1</sup> Developing Asia refers to the developing member countries of the Asian Development Bank. In line with ADB practice, the paper disaggregates the developing member countries into various geographical subgroupings, namely Central Asia, East Asia, the Pacific, Southeast Asia, and South Asia.

Regardless of the actual contribution of the fiscal stimulus to Asia's recovery, the regionwide use of countercyclical fiscal policies brings to the fore the issue of Asia's fiscal sustainability.<sup>2</sup> There are both backward and forward looking reasons for why taking stock of the region's fiscal sustainability is a timely and opportune exercise at this point in time. According to conventional wisdom, what enabled Asia to roll out large fiscal stimulus programs so quickly and decisively was that its public finances were generally in good shape when the global crisis erupted. In particular, its strong initial public debt positions relative to industrialized countries and many other parts of the world meant that the region was able to afford costly fiscal expansions (see European Commission 2009a and IMF 2003). There are also a number of arguments for why countercyclical fiscal policy works best from an initial position of fiscal strength. For example, fiscal expansion in a country with a high debt level could trigger adverse reactions in the financial markets, which would seriously harm business confidence. Therefore, it is worthwhile to take a backward look at the current and past state of fiscal health and sustainability across Asia. Doing so would give us a better idea of the extent to which the conventional wisdom of a fiscally responsible region is justified. Such an analysis would also allow us to identify differences across subregions and countries. An analysis of how countries have adjusted their fiscal balances in response to rising debt levels in the past will provide further evidence on the "fiscally responsible Asia" hypothesis. To the extent that we find empirical support for the hypothesis, we will have greater confidence that Asia will take effective measures to normalize public finances as the world economy returns to normal mode.

Going forward, Asia's fiscal sustainability matters for a number of reasons. For one, regardless of the validity of the popular belief that the region's fiscal stimulus made a big contribution to its recovery, the stimulus will raise public debt levels and debt servicing costs in the short term, relative to the counterfactual of no stimulus. For another, and more worryingly, there is a risk that the sizable deterioration of the fiscal balance as a result of the anticrisis fiscal stimulus packages will not be fully reversed even after the global crisis recedes and normalcy returns. From a broader perspective, the biggest risk is that the region's anticrisis fiscal stimulus might turn out to be a "game changer" that fundamentally alters the region's conservative fiscal philosophy and outlook. For the most part, the region's fiscal policy has been geared toward providing growth-conducive public goods such as infrastructure and education within the government's budget constraint. The general aversion to large and persistent budget deficits was rooted in the region's high premium on macroeconomic stability. The only persistent exception to Asia's generally benign fiscal situation was South Asia. A further factor that limited budget deficits has been the region's general reluctance to pursue countercyclical fiscal policy to stabilize output. For example, automatic fiscal stabilizers such as unemployment benefits remain underdeveloped in the region.

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<sup>2</sup> As discussed below, fiscal sustainability refers to whether government budgets can be smoothly financed without generating explosive increases in public debt. A sustainable fiscal policy is not necessarily an optimal fiscal policy but optimal fiscal policies will need to be sustainable (Horne 1991).

International experience informs us that political economy factors make it difficult to reverse fiscal expansion undertaken during business cycle downturns when the cycle moves up again. This can lead to a ratcheting up of public spending and debt over time. For example, political opposition may stymie the reversal of tax cuts implemented during a recession even though the economy may have come out of the recession. Similarly, the expansion of social welfare benefits during downswings may be difficult to roll back when the economy recovers. At a broader level, intuitively, it is politically easier for governments to increase spending and cut taxes during recessions than to cut spending and increase taxes during booms. This gives countercyclical fiscal policy an inherent structural bias toward higher public spending and debt over time. From Asia's viewpoint, the popular perception that fiscal stimulus packages are effective in promoting recovery may lead to fiscal activism in general after normalcy returns. That is, even though the fiscal stimulus packages were an exceptional response to an exceptional crisis, their perceived effectiveness may provoke popular calls for countercyclical fiscal activism during noncrisis periods.

In addition to the direct effect of the anticrisis fiscal stimulus and a “game-changing” shift in the region's fiscal philosophy, there are a number of other structural factors that imply a potentially large increase in the region's demand for fiscal resources in the medium term. One is population aging, a seismic demographic transition fundamentally reshaping Asia's demographic profile. While there are differences across subregions—the transition toward older populations is much more advanced in East and Southeast Asia than in South Asia—all demographic indicators point to a fast-aging Asia. Building up mature, well-functioning pension systems will require a substantial amount of fiscal resources. Another structural force is rebalancing the region's growth toward domestic demand, an issue explored in great detail in ADB (2009b). The impact of fiscal policy on the rebalancing process will be determined by the effectiveness of specific microeconomic fiscal measures such as strengthening health, education, pension, and social protection. Such measures can promote domestic consumption and hence domestic demand by diluting the precautionary motive for saving. A supply-side example is removing fiscal incentives that favor export production (e.g., manufacturing), over production for the domestic market (e.g., services). In principle, such pro-balancing fiscal measures need not involve a quantitative expansion of the government and can be achieved by shifting the composition of government expenditures. In practice, given the low-tax, small-government policy environment that characterizes the region, it is likely that implementing such measures will require moderate expansion.

There are also two policy-related reasons why Asia's fiscal sustainability matters, and matters a whole lot, at this point in time. One is immediate and concerns an exit strategy, or the issue of when and how to unwind the region's anticrisis fiscal stimulus packages. There is a delicate balance between exiting “too soon, too quickly” and “too late, too slowly”, with both entailing substantial costs. In the case of Asia, there is a risk that the region's relatively healthy public finances may lull policymakers into downplaying the very

real costs of exiting “too late, too slowly”. At a minimum, our examination of the region’s fiscal sustainability will remind policymakers about those costs and encourage them to factor them in more explicitly into their policymaking calculus. The second policy-related motive for our analysis is related to the first, and it is to alert the region’s policymakers to the need for strong medium-term fiscal policy frameworks that promote fiscal sustainability in the medium and long run. The medium-term impact of the anticrisis fiscal stimulus packages, along with new fiscal demands that are expected to arise in the medium term, make it imperative for regional policymakers to actively explore effective and credible medium-term policy frameworks. Regardless of the exact timing and nature of exit from the current fiscal stimulus, such frameworks will also assuage the public’s concerns about the threat to long-term fiscal sustainability posed by the stimulus.

The rest of our paper is organized as follows. Section II reviews the concepts of static and dynamic fiscal sustainability and some alternative approaches to their assessment. Section III considers the key dimensions of the public finances across developing Asia, focusing in particular on fiscal balances, government spending, and revenues, as well as levels of public debt. Section IV discusses the results from a number of econometric tests of fiscal sustainability based on panel regression techniques, and presents estimates of fiscal policy response functions to investigate the responses of primary fiscal balances to changes in debt ratios. Section V presents three alternative scenarios or stress tests of the potentially adverse implications for fiscal sustainability if countries were to postpone for too long the reversal of recent stimulus packages or adjust in too timid a manner. Section VI discusses the role robust medium-term fiscal policy frameworks might play in helping Asia attain and maintain fiscal sustainability in the postcrisis period. Finally, Section VII concludes with an overview of the main findings of our paper, along with the policy implications of those findings.

## II. Conceptual Review of Fiscal Sustainability

Fiscal sustainability is the state wherein the government budget can be smoothly financed without generating explosive increases in public debt (or money supply<sup>3</sup>) over time. When this condition is met, the budget is said to be sustainable and, conversely, when the condition is not met.<sup>4</sup> In some contexts, it is useful to draw an explicit distinction between static fiscal sustainability (when the budget can be financed smoothly period by period) and dynamic fiscal sustainability (when the budget does not lead over time

<sup>3</sup> In what follows, we abstract from monetary financing, as this has generally not been an issue in the region. Moreover, many central banks in the region, under their constitutions, are not permitted to directly finance fiscal deficits and have adopted inflation targeting frameworks, implying that low and stable inflation are the key objective of monetary policy. See BIS (2006).

<sup>4</sup> Note that fiscal sustainability is different from external sustainability. Whereas fiscal sustainability covers the government budget, external sustainability deals with whether the balance of payments can be smoothly financed without explosive increases in external debt. See Chalk and Hemming (2000) and IMF (2003) for further discussion.

to explosive increases in public debt). Loosely, static sustainability refers to the ability of the government to fund its budget on a period-by-period basis (funding liquidity) while dynamic sustainability is concerned with very long-term fiscal solvency.<sup>5</sup> Both static and dynamic fiscal sustainability are important, and threats to either or both can have implications for macroeconomic and financial stability.<sup>6</sup>

Even though fiscal sustainability is generally regarded as very important, there is no universal agreement about how it should best be assessed. Various approaches to assessing fiscal sustainability have been used, and it is useful to consider some of the key approaches. For illustrative purposes, equation (1) describes the (ex ante) government<sup>7</sup> budget constraint under the assumption that all government spending (including gross interest payments) is included in government expenditure (G); and that all government receipts<sup>8</sup> are included in revenues (Z). Abstracting from central bank financing,<sup>9</sup> equation (1) implies that differences between government revenues and expenditures in any period (the budget surplus) will be reflected in changes in the outstanding stock of (one period) public debt (B)<sup>10</sup> held by the nongovernment sector.

$$Z(t) - G(t) = - (B(t+1) - B(t)) \quad t= 1,2, 3,\dots\dots\dots N \quad (1)$$

To better focus on public debt dynamics, it is useful to separate out the interest payments on public debt from all other government expenditure and define S as the primary (or nondebt-interest-related) budget surplus.<sup>11</sup> With R as the one-period nominal interest rate factor,<sup>12</sup> equation (1) can be written as follows where S(t), the primary fiscal surplus, is defined as Z(t) - G\*(t) with G\*(t) denoting primary government spending.

$$B(t+1) = R B(t) - S(t) \quad t= 1,2, 3,\dots\dots\dots N \quad (2)$$

<sup>5</sup> At a fundamental level, the distinction has to do with the difference between illiquidity and insolvency (see Horne 1991, Blanchard et al. 1990, Bohn 1995).

<sup>6</sup> Financial stability can be threatened directly in circumstances, such as in much of Asia, where local banking systems hold substantial amounts of public debt. Asian bond markets and bank exposure to public debt are regularly assessed in the Asia Bond Monitor of the ADB.

<sup>7</sup> As argued in the next section, fiscal policy can be assessed for various levels of government or for the public sector as a whole. In the case of countries with significant state-owned enterprises or government linked companies, the lines between the "private" and "public" sectors can be difficult to draw and may be changing over time under reform programs.

<sup>8</sup> These would include tax and nontax revenues and, in the case of governments with asset holdings, the income on those assets.

<sup>9</sup> In any period, some part of government spending may be financed by the central bank acquiring public debt on the primary or secondary market. Such implicit monetization is netted out of equation (1) and is generally small in the region.

<sup>10</sup> Public debt refers, in general, to outstanding government borrowing, which is assumed for illustrative purposes to take the form of bonds rather than bank loans.

<sup>11</sup> Here, and in what follows, we abstract from any assets held by the government, and we do not distinguish between gross and net debt.

<sup>12</sup> That is to say, R is 1 plus the nominal interest rate.

According to equation (2), the dynamics of public debt are linked to the interest rate on public debt and the size of the primary surplus (S). In circumstances when the primary balance is zero, the equation implies that the public debt will grow at the (nominal) interest rate. Conversely, the growth of the public debt will be less than the nominal interest rate when the primary balance is in surplus. In all cases, the behavior of public debt in relation to gross domestic product (GDP) will also be influenced by whether the nominal interest rate is above or below the growth rate of nominal GDP (as discussed below).

By solving equation (2) forward over time, the public debt in period t can be written as follows:<sup>13</sup>

$$B(t) = \sum_{j=0}^{\infty} R(t, t+j)^{-1} S(t+j) + \lim_{T \rightarrow \infty} R(t, t+T)^{-1} B(t, T+1) \quad (3)$$

Here,  $B(t, T+1)$  is the terminal or very long-term debt stock and  $R(t, t+j)$  is the discount factor between period t and period t+j, which is defined as  $\prod_{k=0}^j R_{t+k}$ . Generally, dynamic fiscal sustainability is taken to require that the terminal debt stock (discounted at a positive interest rate) approach zero as T approaches infinity, which can be regarded as ruling out “Ponzi-Madoff” schemes in which new debt explodes or is rolled over indefinitely.<sup>14</sup> With this condition imposed, the interpretation of equation (3) is that the fiscal situation is ex ante (dynamically) sustainable if the present value of all primary surpluses matches the value of the current debt stock. Alternatively, if the current debt stock is zero, the requirement for fiscal sustainability is that the present value of all (noninterest or primary) government expenditures should match the present value of all government revenues as given by equation (4).

$$\sum_{j=0}^{\infty} R(t, t+j)^{-1} G(t+j) = \sum_{j=0}^{\infty} R(t, t+j)^{-1} Z(t+j) \quad (4)$$

By virtue of its dependence on the behavior of public debt over an infinite time period, fiscal sustainability is a somewhat abstract condition. As noted below, policy-based assessments of fiscal sustainability invariably deal with the behavior of debt over short- to medium-term time periods and are guided, in varying degrees, by the very long-term considerations underpinning the abovementioned terminal condition. Notwithstanding these considerations, however, budget constraint equations such as given by equations (3) and (4) make clear that the fiscal stimulus introduced during the global slowdown will need eventually to be paid back through either higher government revenues or lower

<sup>13</sup> An alternative approach is to express the items in the budget as proportions of GDP. Under such an approach, the long-run terminal condition discussed below involves not only the nominal interest rate but also the nominal growth rate of GDP. Satisfaction of the terminal condition is related to whether the nominal interest rate is above or below the growth rate of the economy (see below for further discussion).

<sup>14</sup> See Horne (1991), Chalk and Hemming (2000), and Mendoza and Ostry (2008) for further discussion. In practice, many sustainability tests are based on the weaker condition that the long run debt ratio stabilizes over a finite horizon of 3–5 years (see below).

expenditures. This is a consequence of the “no free lunch” condition implied by dynamic fiscal sustainability and the positive discount factor ( $R$ ) underlying the analysis.<sup>15</sup>

Testing whether the fiscal sustainability condition that the (ex ante) government budget holds over time is not easy to apply in practice. Not only is there the difficulty that the constraint holds over an infinite (unobservable) time horizon, but there are also difficulties related to the fact that there are few theoretical restrictions on the values of government spending and revenues. With the possible exception of some extreme boundary conditions, such as revenue should not exceed GDP, or that there be a certain minimum level of noninterest-related government spending, there are, in principle, an infinite number of ways in which the sustainability condition might be satisfied.<sup>16</sup> Hence, for example, if a government was currently running a large fiscal deficit with public debt rising sharply, it would be difficult to conclude that sustainability was necessarily violated. This is because the government may be planning to cut spending and run large fiscal surpluses in the very distant future so as to satisfy the sustainability condition over time. And, arguably, even in the most extreme cases of fiscal extravagance, there could always be some future level of government spending and taxes to ensure that conditions such as equation (3) are satisfied.

Based, inter alia, on these types of considerations, it is therefore frequently argued that fiscal sustainability analysis is more of an “art” than a “science”. Such analysis deals not so much with what could happen (including whether there may be a fiscal crisis in the event policy is not sustainable),<sup>17</sup> as with what will happen based on factors such as past experiences with fiscal adjustment. In these circumstances, estimates of fiscal policy reactions—which measure how governments have traditionally responded to rising debt levels—can be important tools in assessing the prospects for fiscal sustainability, as discussed below.

Assessments of fiscal sustainability have tended to adopt one or more of a number of interrelated approaches. For the most part, the assessments have focused on dynamic rather than static sustainability, although there was some discussion of the latter in last year’s *Asia Economic Monitor* (ADB 2009a). The *Asia Economic Monitor* noted that there had been a number of “failed” public debt auctions in the context of seeking to finance some of the fiscal stimulus packages in the region in 2009, and it reviewed the

<sup>15</sup> A little reflection also makes clear why fiscal sustainability needs to be discussed with reference to the ex ante (rather than ex post) government budget constraint. Necessarily, the ex post government budget constraint must be satisfied since spending must always match receipts when allowance is made for arrears. And, in the case of longer-term public debt, its market value would be expected to take into account whether there was fiscal solvency, implying that the intertemporal budget constraint might always hold in mark to market terms. In ex ante terms, however, the government budget need not be balanced over time, and issues of dynamic fiscal sustainability arise when public debt grows at potentially explosive rates (Horne 1991, IMF 2003).

<sup>16</sup> See discussion in Chalk and Hemming (2000) and Bohn (1991, 1995, 1998).

<sup>17</sup> Threats to fiscal sustainability need not necessarily lead to fiscal crises as conventionally defined. Instead, they might lead to debt monetization and inflation, or to (formal or informal) debt restructuring. Moreover, the implications of unsustainable fiscal policy would be expected to depend as well on whether there is an accompanying problem of external debt sustainability.

circumstances and implications of these failures. If the government is not able to sell (or roll over) its public debt as a result of “failed” auctions, static fiscal sustainability will be violated. The *Asia Economic Monitor*, however, did not judge this to be a major issue in the region during the global crisis.<sup>18</sup>

Broadly, three different sets of approaches to assessing dynamic fiscal sustainability can be identified (see Blanchard et al. 1990, Celusun et al. 2006). One approach involves time series tests in which the (formal) time series properties of variables such as primary and nonprimary government spending and revenues, interest payments, and public debt stocks are assessed (see, for example, Trehan and Walsh 1988 and 1991, Haug 1991, Hostland and Karam 2006). In some instances, the focus is on whether the debt stock (or the debt stock in relation to GDP) is a stationary variable based on the application of standard unit root tests.<sup>19</sup> In line with some of the oldest approaches to assessing fiscal sustainability (Domar 1944), these tests effectively consider whether public debt or the ratio of public debt to GDP is stationary (in a statistical sense) and exhibits mean reverting tendencies. Effectively, these types of tests involve determining whether the time series for a variable such as the debt stock (or the debt ratio) exhibits the kind of explosive behavior that might be expected in the event that fiscal policy is unsustainable. In another time series approach, the literature on asset price bubbles is applied to test whether the time series for debt stocks include a bubble term (or unstable root) such as might be found in the case of fiscal policy being unsustainable (Hamilton and Flavin 1986, Horne 1991, Chalk and Hemming 2000). In addition, there are tests of the cointegrating relationships that would be expected to hold among various variables in the event that fiscal policy is sustainable as given in equation (3). These tests involve considering whether certain fiscal variables such as government spending and taxes share common stochastic trends consistent with the dynamic government budget constraint and fiscal sustainability.

By their nature, time series tests are backward looking (in so far as they use historical data) and only measure indirectly the extent to which the conditions for fiscal sustainability are satisfied. Explicitly or implicitly, the approaches also assume that the distant future will “look like” the past and that policies that were sustainable in the past will continue to be sustainable in the future. In practice, the time series approaches to fiscal sustainability have not been very common for, at least, three reasons. First, these approaches typically require relatively long time series of data that are frequently not available in the fiscal area, especially as regards public debt.<sup>20</sup> Secondly, the power of unit root tests tends to be relatively low (especially in small samples) in distinguishing, in particular, between situations in which fiscal policy may be close to being sustainable and when it is unsustainable. And, finally, as argued by Bohn (1995 and 1998), the links

<sup>18</sup> Viet Nam, in particular, experienced some failed debt auctions but these were judged to have reflected a temporary mispricing of initial issuance.

<sup>19</sup> See, for example, Adedeji and Thornton (2008).

<sup>20</sup> This problem is mitigated to some degree through the use of panel cointegration techniques that make use of cross sectional as well as time series data (Adedeji and Thornton 2008).

between these tests and fiscal sustainability is not necessarily very close and some basic time series tests do not fully exploit the implications of uncertainty in deriving appropriate tests of fiscal sustainability.<sup>21</sup>

More fundamentally, a shortcoming of the time series approaches is that they do not explicitly identify the fiscal policy reaction functions that underlie the data. As a result, they do not shed much light on the kinds of fiscal policies that might deliver sustainability, or identify why sustainability may not have held in the past. The next two approaches focus directly on fiscal policy behavior as reflected in the primary fiscal balance.

Another set of tests can be referred to primary balance tests as they involve estimating “decision rules” for primary fiscal balances and, in particular, for how primary balances respond to changes in public debt and other variables (Bohn 1998, Chalk and Hemming 2000). These tests are also backward looking in so far as they model fiscal decision rules based on past behavior. They have the desirable feature, however, in that they focus on fiscal responses and, in particular, on how the primary fiscal balance (as a measure of the fiscal adjustment effort) is adjusted as public debt increases. Intuitively, the basis for these tests is that a tendency for primary surpluses to increase as public debt increase over time will tend to support (dynamic) sustainability.

The approach can be illustrated using the explicit uncertainty framework adopted by Bohn (1998) and Bartolini and Cottarelli (1994) in which equation (3) above is effectively replaced by equation (5):

$$B(t) = E \sum_{j=0}^{\infty} \beta^j u'(c(t+j)) / u'(c(t)) S(t+1) + \lim_{T \rightarrow \infty} E_t \beta^{T+1} u'(c(t+T+1)) / U'(c(t)) B(t+T+1) \quad (5)$$

Here  $E$  is the (mathematical) expectations operator<sup>22</sup> and  $u'(c(t+j)) / u'(c(t))$  denotes the marginal rate of substitution between consumption ( $c$ ) in two adjacent time periods. Equation (5) is analogous to equation (3) but applies when uncertainty is explicitly modeled and the (one period) discount factor is replaced by the potentially time-varying marginal rate of substitution in consumption. Using equation (5) the condition for sustainability is that the terminal debt stock discounted by the expected marginal rate of substitution in consumption approaches zero as  $T \rightarrow \infty$ , which implies that equation (6) holds.

$$B(t) = E \sum_{j=0}^{\infty} \beta^j u'(c(t+j)) / u'(c(t)) S(t+1) \quad (6)$$

It is possible, following Bohn (1995), to write the relationship between the primary surplus and public debt in a simple linear based decision rule as in equation (7) below. In equation (7), lower case letters are used to denote the public debt ( $b$ ) and primary surplus ( $s$ ) as proportions of GDP,  $\mu$  denotes temporary (stationary) influences on the

<sup>21</sup> Bohn (1998), in particular, has argued that some of the time series tests may reject sustainability in circumstances where fiscal policy is sustainable.

<sup>22</sup> All expectations are conditional on information through the current period.

primary balance to GDP ratio,<sup>23</sup> and  $\varepsilon$  is a white noise error term. The coefficient  $\rho$  measures the response of the primary balance to changes in the debt ratio while  $\beta$  measures the response of the primary balance to the temporary factors included in  $\mu$ .<sup>24</sup>

$$s(t) = \rho b(t-1) + \beta \mu(t) + \varepsilon(t) \quad \varepsilon \cdot (0, \sigma^2) \quad (7)$$

Bohn (1998) argues that a sufficient condition<sup>25</sup> for fiscal policy to be sustainable—and for equation (6) to hold—is that  $\rho$  be positive in value. And, to avoid explosive increases in public sector assets over time (i.e., situations in which gross debt is unbounded and approaches negative infinity),  $\rho$  should also be less than unity. Based on the estimation of equations such as (7), hypotheses about the sign and size of  $\rho$  can be tested statistically (Chalk and Hemming 2000, Bohn 1995, IMF 2003, and Mendoza and Ostry 2008).

Equation (7) is the key equation for assessing fiscal sustainability in this framework since it determines whether the primary balance responds in a stabilizing manner to changes in the debt ratio. A value for the response parameter  $\rho$  between zero and unity implies that the primary surplus increases as the debt ratio rises, which is sufficient for dynamic sustainability. And the closer  $\rho$  is to unity, the larger, or more forceful, is the fiscal policy response to increases in the debt ratio. Conversely, if  $\rho$  is zero or negative, the implication is that higher debt ratios lead either to no response of the primary surplus; or to a smaller, primary surplus. In such circumstances, fiscal policy may be unsustainable if it leads to explosive public debt ratios.<sup>26</sup> Based on this reasoning, (estimated) values of the  $\rho$  coefficient along with the response of primary balances to temporary shocks as captured through the  $\mu$  term can be used to “score” fiscal policy responses. For example, a value of  $\rho$  that is close to unity can be scored as a “forceful” policy response and a value close to zero as a “damped” response. The estimated values of  $\beta$ , on the other hand, measure the response of fiscal policy to temporary factors such as the business cycle (as measured, say, by gaps between actual and potential output); or to temporary swings in (primary) government spending as discussed by Barro (1979).

Notwithstanding the role the  $\rho$  coefficient plays in determining the prospects for dynamic sustainability, it needs to be recognized that the behavior of debt ratios over the short to medium term horizons also depends importantly on the behavior of the gap between the interest rate on public debt and the growth rate of the economy. In circumstances where the growth rate is above the interest rate, short-term debt to GDP stabilization can occur even when the primary balance is in deficit. In such circumstances, a failure of the primary balance to increase as debt increases—which is sufficient for very long

<sup>23</sup> As discussed below, these temporary influences include temporary government spending shocks and the deviation of output from trend.

<sup>24</sup> Note that  $\beta$  and  $\mu$  can be appropriately dimensioned vectors.

<sup>25</sup> The reason why this is a sufficient (and not necessary) condition is that there may be nonlinear decision rules that are consistent with sustainability. In addition, in circumstances where nominal interest rates are below the growth rate of the economy, debt-to-GDP ratios can decline even in the presence of a primary deficit.

<sup>26</sup> Sustainability will also be influenced by whether the nominal interest rate is above or below the growth rate of nominal GDP.

sustainability when the interest rate is above the growth rate—will not necessary preclude a stable debt-to-GDP ratio in the near term. As we note below,<sup>27</sup> in some subregions and countries, the debt ratio has been stable even in circumstances when the primary balance has been in deficit. Over long time periods, however, fiscal sustainability will be supported by the primary balance increasing as the debt ratio rises.

If the fiscal situation is sustainable ( $\rho \in (0,1)$ ), the long-run expected value of the debt ratio can be written as in equation (8) below.

$$E(b(t)) = (-\bar{\mu} + (1 - \rho) \text{cov}(1 + \phi, b(t-1))) / \rho(1 + \phi) - \phi \quad (8)$$

Here  $\phi$  is the difference between the nominal interest rate and the nominal growth rate of the economy (assumed to be positive in the very long run), the term  $\text{cov}(\dots)$  represents a covariance term, and a bar is used to denote a long-run value of a variable. This equation determines the expected value of the long-run debt ratio, which depends critically not only on the value of  $\rho$  but also on the gap between the nominal interest rate and the nominal growth rate of the economy.

More generally, the primary balance framework for fiscal sustainability can be extended in a number of directions including allowing for nonlinear or lagged relationships between the primary surplus and public debt, or by allowing for the response parameter ( $\rho$ ) to vary over time. As regards nonlinearity issues, a particular interesting possibility is that there are threshold effects whereby the response of the primary balance to the debt stock might increase or diminish as debt levels rise as part, perhaps, either of “wake up calls” or of “adjustment fatigue.”<sup>28</sup> The presence of such effects would raise the possibility that the implications of fiscal slippages depend on the debt levels at which they occur, and that the resulting adjustment path could be different depending on the initial level of debt.

A third of tests can be described as scenario or stress tests and have been widely used by the International Monetary Fund, World Bank, and Asian Development Bank. These tests are based on “what if” or “stress test” type modeling either with respect to the implications for fiscal sustainability of continuing with current fiscal policies (as defined by the primary balance) or of identifying the gap between the primary balance required to produce fiscal sustainability and the current fiscal policy settings.

The application of these scenario approaches can be illustrated by noting that the proportional change in the public debt ratio will (approximately) depend on the difference gap between (one plus) the nominal interest rate and (one plus) the growth rate of nominal GDP ( $\phi$ ), together with the primary fiscal surplus and the debt ratio. This is given

<sup>27</sup> See discussion in Section II.

<sup>28</sup> An extreme example of this would be the Debt Laffer curve effect in which there is a tipping point beyond which higher debt produces a reduction in the primary surplus ( $\rho < 0$ ). This case would be a fiscal policy analogy to the original Bulow-Rogoff model of sovereign debt problems and the Debt Laffer curve (Blanchard and Fischer 1989).

by equation (8) where  $\Delta$  denotes a proportional change and  $\phi$  denotes the difference between the nominal interest rate and the growth rate of nominal GDP.<sup>29</sup>

$$\Delta b(t) = \phi(t) - s(t) / b(t) \quad (8)$$

Under the first type of exercise, the time path for the debt ratio is projected on the basis of a given set of assumptions about the primary surplus (for example, which is constant in relation to GDP) and the gap between the nominal interest rate and the nominal growth rate ( $\phi$ ). In the event that this produces an “explosive” increase in the debt ratio over a given time horizon, the assumed, or current, fiscal policy stance would be judged unsustainable. This is because it might violate the terminal condition on debt and lead to the debt-to-GDP ratio increasing beyond bounds. Conversely, in the second type of exercise, the approach would be to compute the primary surplus required to deliver a given sustainable path for the debt ratio over the medium term (for example, that the debt ratio be constant). Any gap between this surplus (the debt-stabilizing surplus) and the actual primary surplus would then be seen as implying the amount of fiscal adjustment required to deliver fiscal sustainability.

These approaches are illustrated in equation (9) where the fiscal gap ( $\omega$ ) is defined as the difference between the sustainable primary balance ( $s^s$ ) and the actual balance ( $s^a$ ), with the former defined as the balance required to hold the debt ratio constant at its current level.<sup>30</sup>

$$\omega(t) = [(R(t) - \eta(t))b - s^a(t)] \quad (9)$$

Both these types of scenario or stress tests are useful for shedding light on fiscal sustainability. As in the case of the primary-balance approach to sustainability discussed above, the gap between the nominal interest rate and the nominal growth rate of the economy ( $\phi$ ) plays a key role. A common assumption is that this gap term will be positive but, as noted in subsequent sections, there are several Asian economies that have grown faster than the nominal interest rate over several years and in which  $\phi$  has been negative. As discussed in Section III, a common assumption in many fiscal scenario exercises is that the nominal interest rate exceeds the nominal growth rate of the economy. In the absence of such a condition—which could imply a departure from dynamic efficiency—very long-run terminal conditions on debt may no longer be binding and public debt can become unbounded.<sup>31</sup> Accordingly, because a positive interest rate gap is necessary for meaningful infinite horizon scenarios, it is sometimes assumed to hold even over

<sup>29</sup> If the economy is dynamically efficient, the modified golden rule implies that the nominal interest rate (or, at least the nominal marginal product of capital) will exceed the growth rate of nominal GDP and hence that  $\phi$  will be strictly positive. See Blanchard and Fischer (1989) for further discussion.

<sup>30</sup> Constancy of the debt ratio is a simplifying assumption. Alternative approaches could allow for any sustainable debt path.

<sup>31</sup> See Blanchard and Fischer (1989) for further discussion of dynamic efficiency and the modified golden rule. When an economy satisfies the modified golden rule, the nominal interest rate will exceed the nominal growth rate of the economy.

the short to medium run (IMF 2003). Over a few years, however, the possibility that economies may grow more rapidly than the interest rate on public debt must be considered, even if this raises issues about very long-run terminal conditions.

Even though the model-based and scenario approaches are different, there are a number of connections between them that can be usefully exploited. Both approaches address the link between the fiscal adjustment effort (measured through the primary balance) and the debt ratio. In the primary balance approach, the policy response parameter for the primary balance ( $\rho$ ) is estimated from the data, whereas in the scenario approaches, the parameter may be imposed from “outside” according to what is judged necessary to produce fiscal sustainability. In principle, the estimated adjustment parameters from the model-based approaches to sustainability can be used to enrich the scenario-based approaches to fiscal sustainability, and account can also be taken of debt tipping points in which the parameter may be different at various debt levels. These are the approaches taken in the final section of the paper.

### **III. Fiscal Diagnostics: Evolution of Key Fiscal Indicators across Asia over Time**

This section reviews fiscal balances, public spending and revenues, and public debt (in relation to GDP) across the region and over time, with particular attention to the breakdown of fiscal positions into primary and nonprimary components, the relationship between primary fiscal balances and public debt ratios, and the links between actual and debt stabilizing primary fiscal balances. In addition, the section reviews key features of countries’ fiscal positions, including the relationship between public debt ratios and various measures of economic size, volatility, and revenue ratios.

The assessment of public finances in the region is a daunting challenge and there are huge difficulties assembling a comprehensive set of fiscal and public debt data for all the developing country members of the ADB. Not only are there familiar problems of occasional missing observations over time and across countries, there are also a number of serious shortcomings as regards the availability of consistent and comprehensive fiscal data in some countries and, in particular, as regards public debt obligations. In addition, only a very limited number of countries publish public sector asset positions (as well as public debt data), meaning that fiscal sustainability analysis needs, for the most part, to be based only on one part of the fiscal picture (liabilities rather than assets<sup>32</sup>). In addition, even in the case of countries that report interest payments on debt, consistent data are not generally available for the actual interest rates on public debt and the extent to which debt may be serviced at concessional or market interest rates. Moreover, to the extent

<sup>32</sup> Income on (any) public asset is implicitly recorded under government revenue.

to which some countries issue public debt to “captive” local buyers (such as local banks, pension funds etc.), the true economic costs of servicing that debt may be different from the recorded costs.

There is also the problem that countries do not generally report contingent (off-balance sheet) and prospective fiscal liabilities. Based on experience, (European Commission 2009a, ADB 1998), these are often the key factors in influencing fiscal sustainability over time, and are where the “fiscal surprises” often occur.<sup>33</sup> The omission of contingent fiscal liabilities implies that the approach adopted in the paper arguably represents the “best case” in so far as the accounting for contingent liabilities would likely lead to the possibility of higher rather than lower future debt ratios, and potentially larger threats to fiscal sustainability.

At the most fundamental level, there is also the issue of how broadly or narrowly the public sector should be defined. Ideally, fiscal sustainability analysis should cover all aspects of public sector operations and activities that have fiscal implications, suggesting a very broad and comprehensive approach. Such comprehensiveness is probably best achieved by focusing on the overall public sector—including all actual and quasi state-owned enterprises and government-linked companies—but it is frequently difficult to draw the line in defining the public sector,<sup>34</sup> and comprehensive data for the entire public sector is frequently difficult to obtain. And, even in those cases where it is only feasible to cover the (formal) government sector, there are often issues related to the availability of data for different levels of government (central, state, and local) and its consistency over time. There are no simple solutions to these and related “boundary” problems in defining the public sector. And, frequently, it is necessary to base the analysis on a “narrow” definition of government due to lack of data for broader definitions of the public sector.

For purposes of the paper, annual data was assembled on government fiscal positions and debt (and other variables) for over 30 developing member countries of ADB from the early 1990s through 2008. Where possible, data for the general government was used but, in several instances, central government data had to suffice. In some cases, series had breaks or gaps and various approaches were used to “gap fill” these series. Even with these approaches, however, the panel data that was collected is somewhat unbalanced, with the most comprehensive time series coverage generally occurring in the more developed countries in the region.<sup>35</sup>

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<sup>33</sup> Much of the deterioration in fiscal positions during the Asian financial crisis was associated with bailouts of distressed banks and other financial institutions.

<sup>34</sup> This is especially the case in economies transitioning from central planning and state ownership to a market economy.

<sup>35</sup> Implicitly, this can lead to a large country bias in which the large countries for which data are available have a disproportionate effect on the results.

One key question that arises in presenting (and interpreting) large amounts of country data concerns the way in which the data are aggregated to produce subregional aggregates. Generally, the aggregates in the *Asian Development Outlook* (ADB 2009b) are based on gross national income weighting in which large countries implicitly receive a larger weight than small countries. Even though such an approach is appropriate for aggregating variables such as GDP, it is not clear whether it should be used for fiscal variables where there is no meaningful concept of a regionwide fiscal position. Based on these types of considerations—and also because the empirical analysis in the next section is based on individual country experience—the fiscal aggregates for the region presented in this section are all unweighted (rather than weighted) averages of data for individual countries and subregions.<sup>36</sup>

In addition to considering fiscal behavior in different countries (the cross sectional dimension), the paper considers also how fiscal experience has evolved over time (the time series dimension). To this end, the section considers average fiscal data both for the period 1990–2008 as a whole and for the subperiods 1990–1997 (pre-Asian financial crisis); 1998–1999 (Asian financial crisis); and 2000–2008 (preglobal financial crisis).<sup>37</sup> The reason for these particular decompositions is that the Asian crisis represented a watershed for fiscal policy for many countries in the region, as many countries experienced large crisis-related fiscal slippages. The unwinding of these fiscal slippages was a primary focus of many countries' fiscal policies in the lead-up to the global crisis in 2009. Needless to say, however, different regions in Asia have differed sharply with respect to their underlying (or structural) fiscal positions and their evolution over time.

Table I (and also Box 1) display key fiscal indicators for the region over the three subperiods referred to above and for 1990–2008 as a whole. In line with ADB's classification, the region is broken down into five subregions: Central Asia, East Asia, the Pacific, Southeast Asia, and South Asia.<sup>38</sup> Both overall and primary fiscal balances in Table I are measured as the difference between receipts and spending so that a positive sign implies a fiscal surplus while a negative sign implies a deficit.

Several observations can be made on the basis of the fiscal indicators in Table I.

- (i) For the period as whole, there is a relatively narrow dispersion of fiscal balances across the region.<sup>39</sup> Across the region, fiscal balances are in small deficit over the entire 1990–2008 period but the deficits are somewhat higher in the Pacific, and especially in South Asia (at over 5% of GDP). With the exception of Central

<sup>36</sup> Given this approach, there is the possibility that the aggregated data may be distorted by large outlier observations in very small countries. Both mean and median values were considered for data presentation, however, and made little difference.

<sup>37</sup> Preliminary estimates and forecasts of fiscal positions (including recent fiscal stimulus packages) for 2009 and 2010 are presented and discussed in the final section.

<sup>38</sup> The countries included in each group are listed in the notes accompanying the tables and charts.

<sup>39</sup> All balances are measured as the difference between revenues and expenditures with the implication that a positive sign denotes a surplus while a negative sign denotes a deficit.

and South Asia, which were not very badly affected by the Asian crisis,<sup>40</sup> other subregions saw their fiscal deficits increase in the late 1990s, but the deficits were then generally pared back.

- (ii) Across the entire period, there is a wide range of experience as regards primary fiscal balances, with some subregions averaging surpluses and others averaging deficits. Southeast Asia, however, is the only subregion running a large primary surplus, while subregions such as South Asia have on average been running relatively large and persistent primary deficits.
- (iii) With the exception of the Pacific where government spending and revenues have been close to or above 40% of GDP, the average levels of government spending and revenues across the region are relatively low and clustered mainly at the low end of the 20–25% of GDP range. These ratios are well below the averages in many other part of the world and, in particular, in developed Europe (IMF 2003, European Commission 2009a).

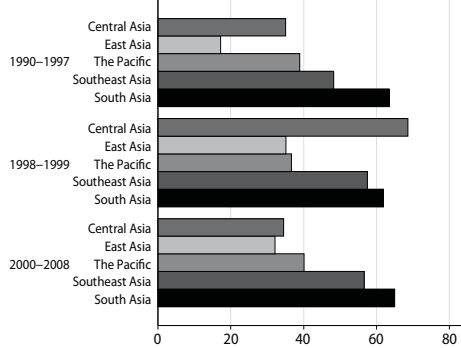
**Table 1: Fiscal Indicators, Ratio to GDP, 1990–2008 (percent )**

Subregion	Period	Public Debt	Primary Surplus	Fiscal Surplus	Government Expenditure	Government Revenue	Interest Payments
Central Asia	1	35.10	−4.70	−7.00	21.00	14.00	1.30
	2	68.70	−3.50	−5.50	20.20	14.70	1.40
	3	34.50	1.00	0.20	25.00	25.20	0.80
	All periods	38.00	0.30	−0.70	24.30	23.60	0.90
East Asia	1	17.30	−0.80	−1.40	18.20	16.70	1.00
	2	35.20	−3.50	−3.70	23.80	19.00	1.70
	3	32.20	0.90	0.20	21.80	22.00	1.00
	All periods	27.00	−0.20	−0.80	20.70	19.70	1.10
The Pacific	1	39.00	1.90	−0.20	38.70	38.50	2.40
	2	36.70	−0.50	−2.10	36.40	34.30	2.20
	3	40.20	−1.70	−2.40	42.70	40.10	1.50
	All periods	39.50	−0.40	−1.70	40.70	38.90	1.80
Southeast Asia	1	48.30	4.80	2.40	19.40	21.80	2.80
	2	57.60	−1.00	−2.40	21.40	18.70	2.10
	3	56.70	0.30	−1.70	20.70	19.10	2.20
	All periods	53.90	1.70	−0.40	20.30	20.00	2.40
South Asia	1	63.60	−2.60	−6.00	27.50	21.60	3.30
	2	62.00	−1.90	−5.00	24.00	19.10	3.10
	3	65.10	−2.10	−5.10	25.50	20.50	2.90
	All periods	64.20	−2.30	−5.40	26.10	20.80	3.10

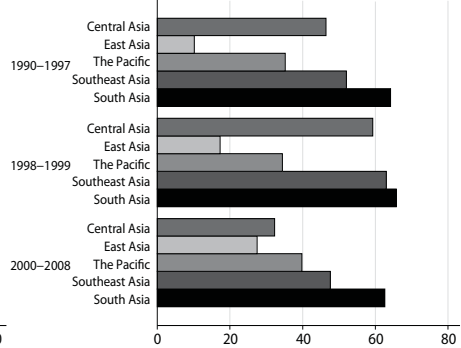
<sup>40</sup> Fiscal developments in Central Asia during the 1990s were influenced importantly by the international treatment of the debts of the former Soviet Union.

### Box 1: Various Fiscal Indicators

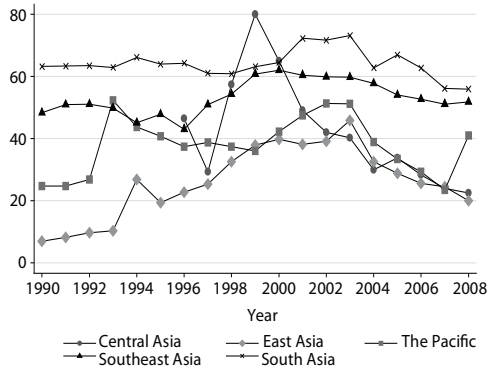
Debt/GDP Ratio by Subregions and Periods (mean values, percent)



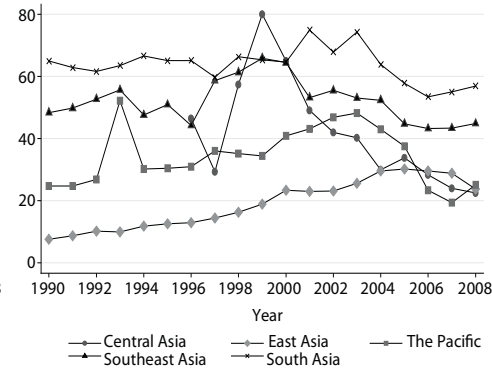
Debt/GDP Ratio by Subregions and Periods (median values, percent)



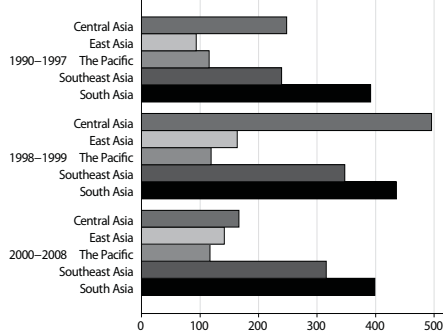
Debt/GDP Ratio by Subregions and Years (mean values, percent)



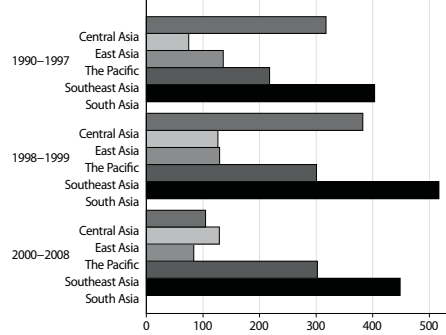
Debt/GDP Ratio by Subregions and Years (median values, percent)



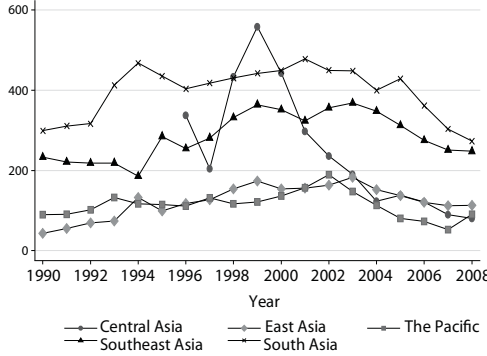
Debt/Revenue Ratio by Subregions and Periods (mean values, percent)



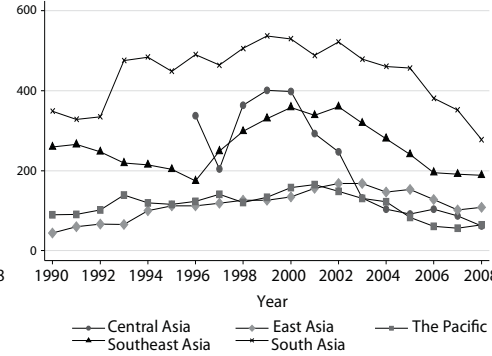
Debt/Revenue Ratio by Subregions and Periods (median values, percent)



Debt/Revenue Ratio by Subregions and Years (mean values, percent)



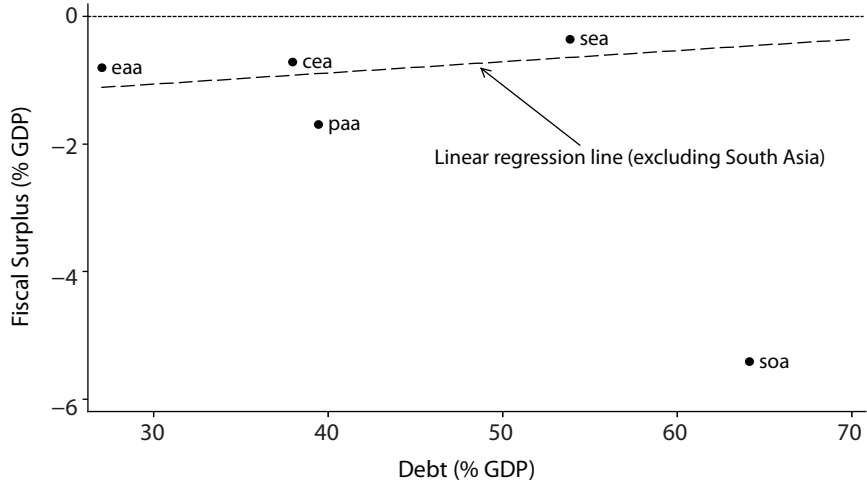
Debt/Revenue Ratio by Subregions and Years (median values, percent)



- (iv) Public debt ratios in the region display considerable heterogeneity and variation over time. Across much of the region, public debt ratios have on average been relatively low (below 40–50% of GDP) with the notable exceptions of Southeast and South Asia. In the case of Southeast Asia, the ratio has been in the range of 50–60% of GDP in the period since the Asian crisis. In South Asia, on the other hand, the ratio has been persistently above 60%. Public debt rose sharply in Central Asia in the late 1990s but then fell sharply in the context of a number of fiscal adjustment and debt restructuring programs.
- (v) Across the region, interest payments on the public debt have been around 1-3% of GDP and show no clear tendency to increase over time. Generally, subregions with the highest debt to GDP ratios also have the highest levels of interest payments to GDP. Reflecting different funding costs, however, related inter alia to the access to concessional funding, the relationship between interest payment and debt is not always very close.

Figure 1 provides another perspective on fiscal positions in the region. The chart displays average (overall) fiscal balances and debt (both as a ratio to GDP) across each of the five subregions over the entire time period 1990–2008. In principle, the observed relationship between the overall fiscal balance and the debt ratio across the subregions could be either positive or negative. The relationship would be negative if the subregions with high public debt ratios were running smaller fiscal surpluses over the period. Conversely, if subregions with higher public debt ratios were running larger fiscal surpluses then the relationship would be a positive one. Accordingly, the nature of the relationship between fiscal balances and debt provides information about whether fiscal adjustment across the subregions is consistent with stabilizing responses of fiscal balances to debt.<sup>41</sup>

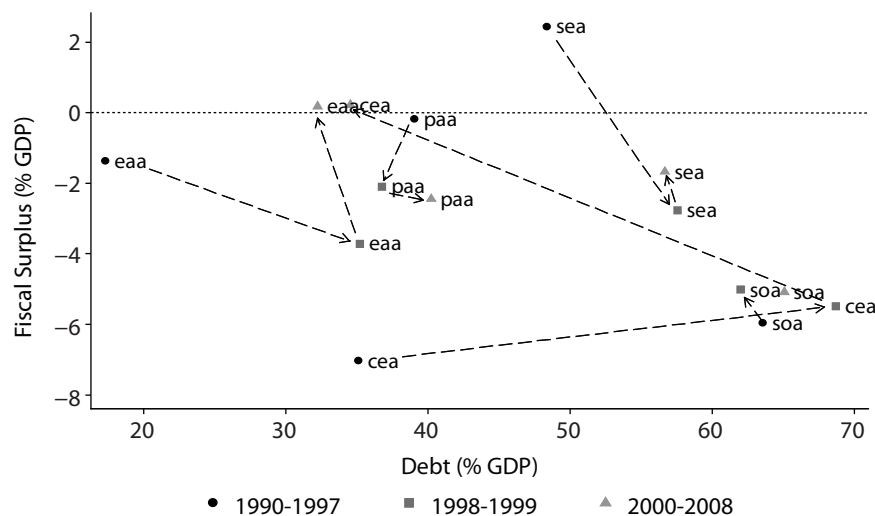
**Figure 1: Fiscal Balances and Debt (1990–2008 averages)**

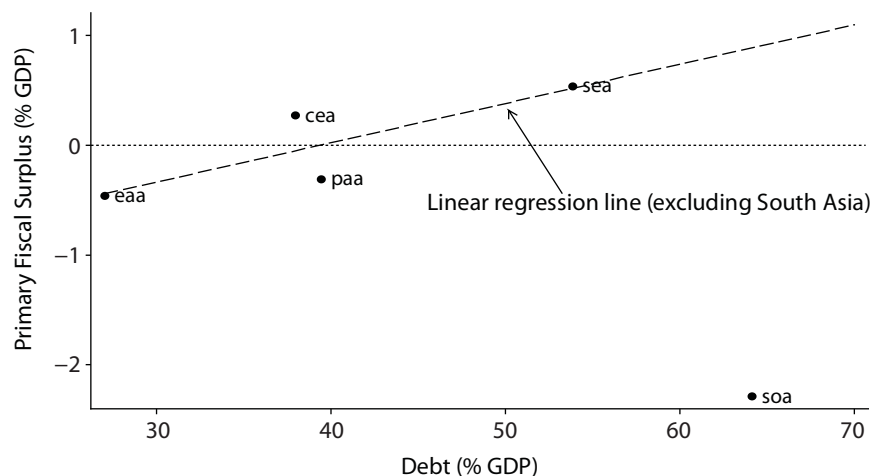
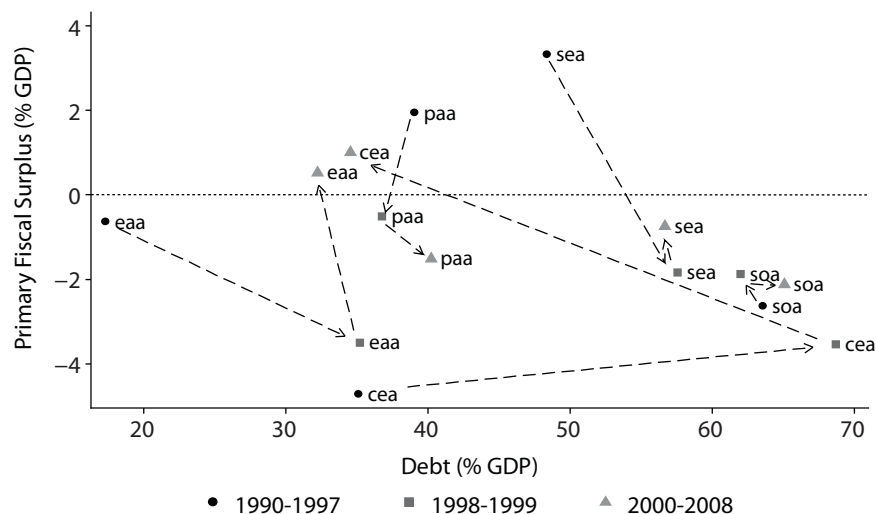


<sup>41</sup> Note that the causation between the fiscal balance and the debt ratio runs in both directions. Larger fiscal deficits can lead to larger increases in debt ratios and, conversely, countries can seek to reduce fiscal deficits in order to stabilize or reduce public debt ratios.

Inspection of Figure 1 reveals that there is a slight positive relationship between overall fiscal surpluses and public debt across the region when South Asia is excluded. This implies that, over the entire period, most subregions with higher public debt ratios tended to run larger fiscal surpluses or smaller fiscal deficits. Conversely, in South Asia, in particular, a high debt ratio over the entire period is accompanied by relatively large fiscal deficits and there is little evidence in this subregion of long-run fiscal adjustment being under way. The time snapshots for the subregions included in the following charts (Figure 2) broadly confirm these patterns through the nature of the relationship between fiscal balances and debt ratios varies across the five subregions for the three subperiods 1990–1997, 1998–1999, and 2000–2008. Essentially, the different relationships across the three subperiods reflect the fact that periods such as 1998–1999 were periods when debt increased sharply during the Asian crisis. On the other hand, periods such as after 2000 have been periods of fiscal adjustment, especially in East and Southeast Asia.

**Figure 2: Fiscal Balances and Debt**  
(averages by periods and subregions)



**Figure 3: Primary Fiscal Balances and Debt (1990–2008 averages)****Figure 4: Primary Fiscal Balances and Debt (averages by periods and subregions)**

In interpreting the two charts, it is useful to note that a positive relationship between primary surpluses and debt implies that fiscal policy has been supporting sustainability. This is because a positive relationship can be interpreted as implying that the primary surplus increases (or the primary deficit is reduced) as the debt ratio increases. Conversely, a negative (or no) relationship between these variables may not be consistent with fiscal sustainability over very long time periods.<sup>42</sup> As shown in Figures 3 and 4, there is a relatively strong positive relationship between primary surpluses and debt across the region when South Asia is excluded. This conforms to the pattern for the regions discussed above with regard to the relationship between the (overall) fiscal balances and debt. As evident from Figure 4, this pattern holds for the most part across the three

<sup>42</sup> Over short periods during which the interest rate is below the growth rate of the economy, however, the fiscal positions may “appear” sustainable and the debt ratio may be falling.

subperiods since 1990 once allowance is made for the Asian crisis-related blow-out of fiscal positions in the late 1990s.

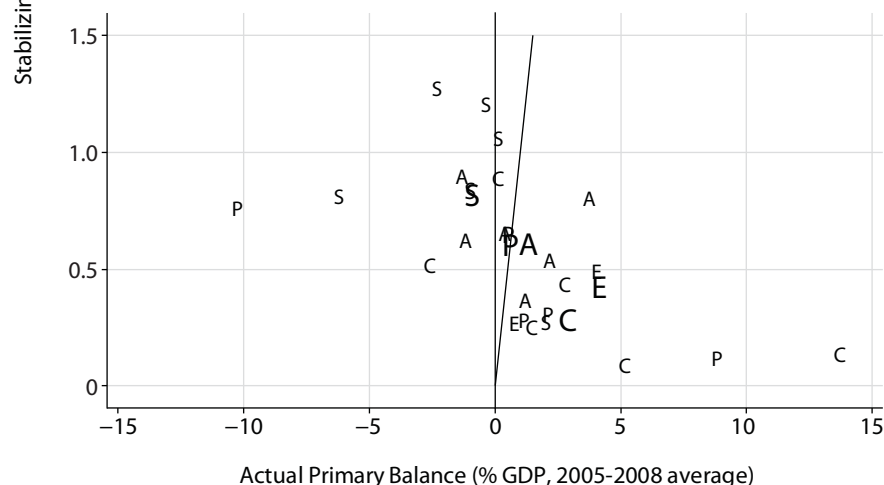
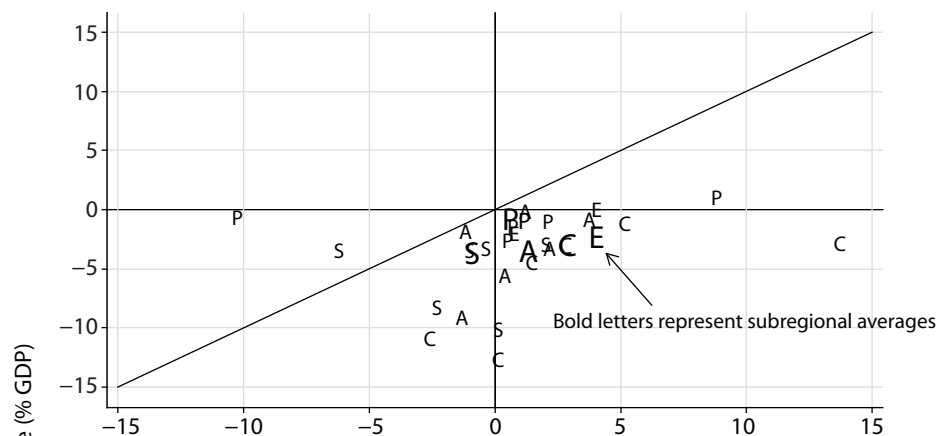
The relationship between actual and debt-stabilizing primary balances, as displayed in Figure 5,<sup>43</sup> provides another perspective on fiscal sustainability. Since fiscal sustainability needs to be evaluated at the country (rather than subregional) level, the chart refers to particular countries from the five subregions and identifies the location of the average for each subregion. The vertical axis of the chart measures the primary fiscal balances required to stabilize debt ratios based on average nominal GDP growth and interest rates over the period 2000 through 2008 for each of the displayed countries.<sup>44</sup> The horizontal axis displays the average primary balance over the same period with a positive number implying a primary surplus and a negative, implying a primary deficit. Accordingly, the observation for each country is a pair of actual and debt-stabilizing primary balances and the chart is divided into two zones. In the top chart, points above the 45-degree line denote points where the debt stabilizing primary surplus is above the actual primary surplus and the debt ratio is increasing. Points below the 45-degree line denote situations when the actual primary surplus is larger than the debt-stabilizing surplus and the debt ratio is on average decreasing.<sup>45</sup> Conversely, points along the 45-degree line denote equality between the actual and debt-stabilizing primary balances and stability in the debt-to-GDP ratio.

<sup>43</sup> The calculation of debt-stabilizing primary balances was discussed in the preceding section. Note that debt-stabilizing primary balances can be negative (i.e., primary deficits) if nominal interest rates are below the nominal growth rate of the economy. Such a condition is unlikely to hold over very long time periods and very long-run assessments of fiscal sustainability are typically based on the assumption that the interest rate exceeds the growth rate.

<sup>44</sup> The calculation is based on equations (8) through (9) in the preceding section.

<sup>45</sup> As the scale of the axes is different in the lower chart, a comparable 45 degree line cannot be drawn. The indicated line plays a comparable role to the 45 degree line in the top chart.

**Figure 5: Actual and Debt-Stabilizing Primary Balances**



| C: Central Asia E: East Asia P: The Pacific S: South Asia A: Southeast Asia

Note: Interest rate assumed 150bp above 2000-2008 average GDP growth rate.  
Debt and primary balance: 2005-2008 averages.

Based on the top part of Figure 5, it is apparent that over the period 2000–2008 most countries in the region fall well within the zone of sustainability even though a number are close to the 45-degree line. Most notably, several countries in the region have on average been running primary surpluses between 0–5% of GDP, with a small number running even larger surpluses. Findings of this kind are consistent with those of several other studies of fiscal sustainability within the region, and those of broader studies that have assessed fiscal sustainability across a number of regions (Horne 1991, IMF 2003, Mendoza and Ostry 2008). Even though these results are encouraging, they should not be seen as grounds for complacency. Not only is it necessary to recognize the slippages in fiscal policy that have occurred during the global crisis, a close inspection of Figure

5 reveals that the debt-stabilizing primary surpluses for several countries in the region have in the past been negative (i.e., primary deficits). This reflects the fact that economic conditions in several countries have been such that the interest rate on debt has been below the growth rate of the economy. Under such circumstances, as illustrated in Figure 5, debt ratios could be stabilized even when running primary deficits that have in some cases been larger than 5% of GDP.<sup>46</sup> Either because this condition is unlikely to hold indefinitely, or on account of the possibility that the actual interest rate may not reflect the true shadow price of debt, the results need to be treated with care. Ultimately, robust debt-stabilizing fiscal policies need to be such as to stabilize the debt ratio in circumstances when the interest rate is above the growth rate.

Against this background, it is also useful to consider the possible implications for fiscal sustainability of interest rates exceeding the growth rate of nominal GDP. Typically, interest rates on the external public debt of many countries exceed the nominal growth rate so that these rates can, in principle, be used in place of (relatively) low domestic interest rates. Unfortunately, however, it is not possible to obtain such data for many of the countries included in Figure 5. Purely for illustrative purposes, the approach taken in the lower part of Figure 5 was to redo the debt stabilizing calculations under the assumption that the “underlying” gap between the nominal interest rate and the growth rate of nominal GDP for all regions was equal to 150 basis points.<sup>47</sup> As can be seen from the chart, this positive interest rate gap has the effect of reducing the number of countries with fiscal positions that are unambiguously sustainable, and pushing some into the unsustainable quadrant. The reason for this is straightforward: A positive interest rate gap implies that all countries are required to run primary surpluses to stabilize or bring down the debt ratio. To the extent that fiscal sustainability in some countries depends on a favorable—but unlikely to persist—ability to finance debt at interest rates below the growth rate, the results in this lower chart may give a more realistic long-term sense of fiscal sustainability. At the least, the chart indicates that fiscal sustainability in some countries in the past has been facilitated by very favorable growth and interest rate conditions. Were these conditions to be less favorable in the future, the maintenance of fiscal sustainability would be more challenging.

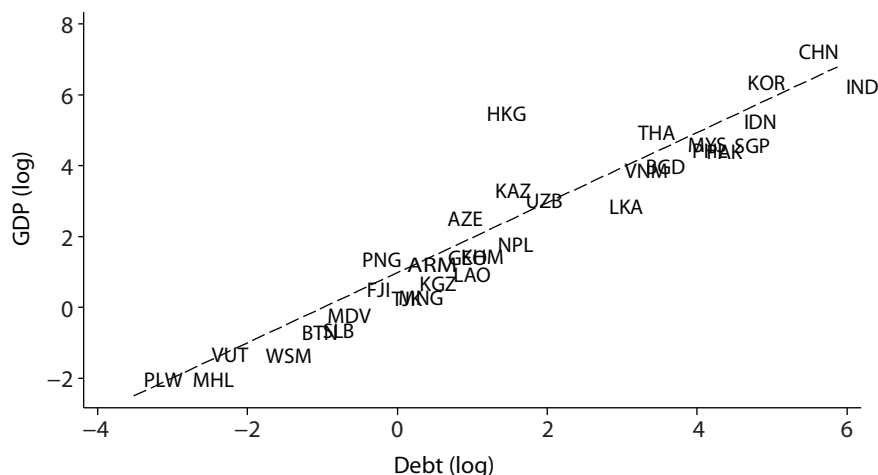
The last few charts and tables provide key structural information for the fiscal situation in the region for 1990–2008. The first two charts (Figures 6 and 7) summarize the relationship between public debt and GDP in both absolute and per capita terms across the region. As shown, there is a strong positive relationship between GDP and debt, and a modest negative relationship between per capita GDP and the debt ratio, albeit

<sup>46</sup> Equations (8) and (9) above describe the relationship between the debt stabilizing primary balance and the debt ratio. Effectively, the primary surplus required to stabilize the debt ratio is equal to the gap between the nominal interest rate and the nominal growth rate of GDP multiplied by the debt ratio. When the gap term is negative, the debt ratio can be stabilized with a primary deficit.

<sup>47</sup> This is based on the average interest rate growth differential in the 2003 IMF study on fiscal sustainability (IMF 2002). Obviously, in practice, the actual differential will differ across countries and may be higher in countries where there are concerns about fiscal sustainability. To the extent that this is the case, some high-debt countries may be even closer to unsustainable fiscal positions.

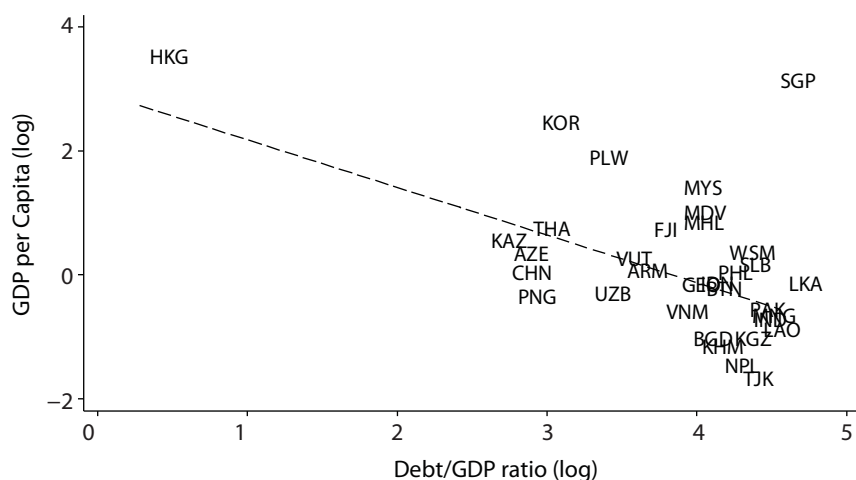
with both Singapore and Hong Kong, China being outliers.<sup>48</sup> Effectively, rich countries in the region do not have higher public debt ratios than poorer countries. Within the region, there is some indication that the highest public debt ratios are among the poorer countries, but the relationship is relatively weak.

**Figure 6: Public Debt and GDP**



Note: 1990-2008 averages in log scale. Specific country averages depend on data availability.

**Figure 7: Public Debt and Per Capita GDP**



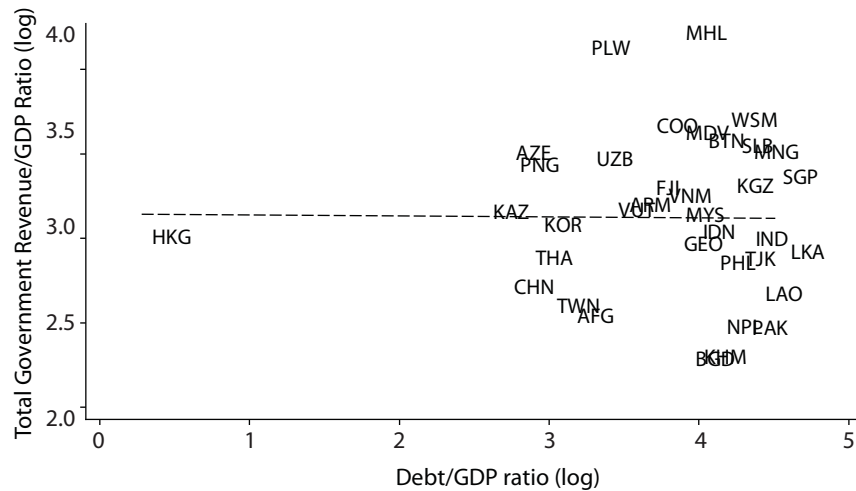
Note: 1990-2008 averages in log scale. Specific country averages depend on data availability.

Traditionally, public debt ratios have been assessed in terms of their size in relation to GDP, with the assumption that the level of GDP provides a useful measure of capacity to service the debt. In practice, however, GDP may not be a very good measure of “capacity” in so far as it does not measure the resources available to the government for debt service. Under quite general conditions, the debt-to-revenue ratio might be a more relevant measure of capacity in so far as it measures how much of GDP the government

<sup>48</sup> In the case of Singapore, the high public debt ratio is matched by an even larger stock of government assets.

has at its command to meet debt service payments. To this end, Figure 8 displays the relationship between conventional debt ratios (as a share of GDP) and ratios to revenue in the region over the period 1990–2008.

**Figure 8: Public Debt and Revenue Ratios**

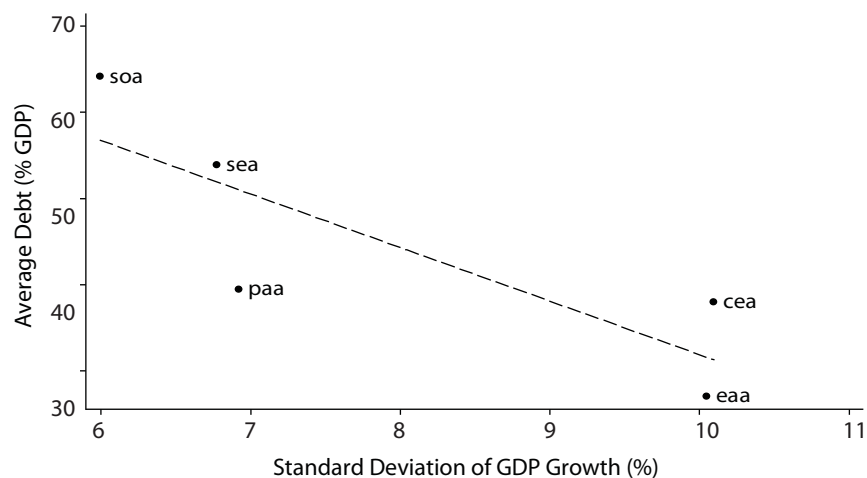


Note: 1990-2008 averages in log scale. Specific country averages depend on data availability.

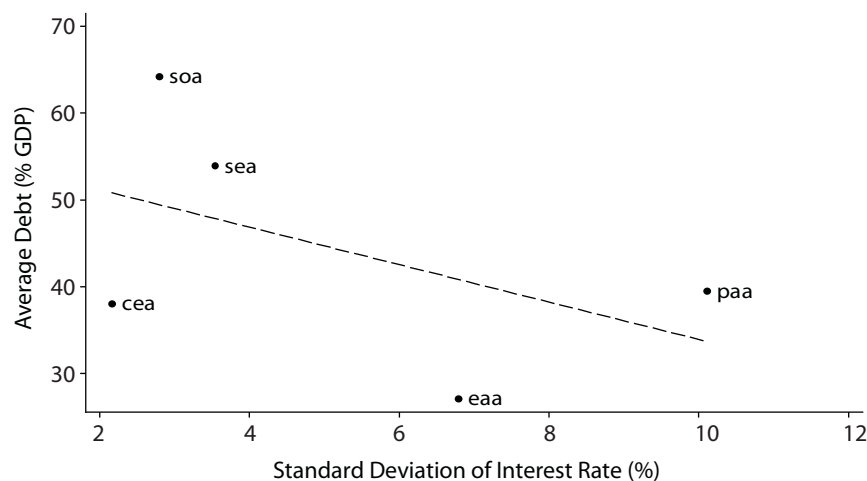
As implied by Figure 8, debt-to-revenue ratios are generally much higher than debt-to-GDP ratios. The reason for this is that revenue-to-GDP ratios generally lie in the 20–40% GDP range. The chart indicates, however, that there is no clear systematic relationship between revenue and debt ratios across countries in the region. Countries with high debt ratios do not generally have high revenue ratios or vice versa. On the other hand, and less positively, there is no indication that countries with higher debt ratios have higher revenue ratios and hence greater debt service capacity.

Finally, the last two charts (Figures 9 and 10) display the relationship between public debt ratios and uncertainty as measured either by the variability of (nominal) economic growth or the variability of interest rates.<sup>49</sup> From a macro prudential perspective, the fiscal positions of countries with high (and uncorrelated) variability in these variables would tend to be more vulnerable to macroeconomic shocks than other countries. In particular, shocks that reduced output growth and raised interest rates would be the most worrisome, as they could widen the interest rate gap that is an important factor in determining the primary fiscal surplus required for sustainability as discussed earlier. Based on the two charts, however, it appears that subregions with the highest debt ratios tend also to be those with the lowest variability as measured by the standard deviation of growth or interest rates.

<sup>49</sup> In both cases, variability is measured by the standard deviation either of annual log changes (in the case of nominal GDP) or of levels (in the case of nominal interest rates).

**Figure 9: Public Debt and Macroeconomic Uncertainty, 1990–2008**

Note: The dashed line represents a linear regression across subregions.

**Figure 10: Public Debt and Financial Uncertainty**

Note: The dashed line represents a linear regression across subregions.

## IV. Econometric Tests of Primary Fiscal Balance Response Functions

This section presents the main results from panel-regression estimates of the fiscal policy response functions discussed in Section II (equation 7). Most of the estimations are based on the application of feasible generalized least squares (FGLS) to an unbalanced<sup>50</sup> panel of time series and country data over the period 1990 through 2008 (and various subperiods) with allowance for “fixed effects”, although an alternative System General

<sup>50</sup> The unbalanced panel is the result of missing time series observations for a number of countries in the panel. The use of unbalanced panels is common in the estimation of fiscal response functions (see Mendoza and Ostry 2008).

Method of Moments (SGMM) approach was also tried. Allowance was made in the estimations: for country-specific autocorrelation and heteroskedasticity; for the responses of primary fiscal balances to debt ratios to be nonlinear and/or vary with debt levels; for the presence of lagged adjustment; and for the interaction between country dummies and debt. In all the estimated equations, the dependent variable is the primary surplus (as a share of GDP) while the independent variables across the different specifications included current and lagged values of the debt ratio, and control variables such as (primary) government spending relative to trend and the output gap,<sup>51</sup> which are included to capture temporary influences on fiscal policy. In some specifications, there are regional or country dummy terms. The key coefficient in the equations ( $\rho$ ) is the one attached to the debt term, which measures the response of the primary balance to debt. As discussed in Section II, a value of this coefficient between zero and unity is consistent with a stabilizing or sustainable fiscal policy response to rising debt. A negative coefficient implies potentially destabilizing responses.

Given serious data limitations and the considerable heterogeneity within the region, the presented econometric results should be treated with care. Based on the estimations, the fiscal policy responses to rising debt levels are not easily captured by simple linear decision rules in several countries and regions, and some of the equations may not be stable over time. Moreover, several important endogeneity issues<sup>52</sup> in the data may not be fully resolved and their resolution could affect the parameter estimates. Be that as it may, the estimated results suggest that primary fiscal balances in some countries (and regions) do respond in a stabilizing manner to increases in debt ratios (i.e., fiscal surpluses are increased in response to rising debt ratios). At the same time, primary balance responds in a relatively systematic way to the business cycle, as proxied by output gaps, and to swings in primary government spending relative to trend.

Various estimation results are presented in Table 2 below. The table includes FGLS, ordinary least squares (OLS), and SGMM estimates for all countries for the sample period 1990–2008 based on a number of alternative specifications of the lag structure on debt, the specification of the control variables in the equations, time trends and interaction effects, and assumed properties of the error terms.

<sup>51</sup> Measured as the deviation of output from trend as measured by a Hodrick Prescott filter.

<sup>52</sup> These are related to factors such as common shocks to primary surpluses and the control variables.

**Table 2: Econometric Estimation Results, 1990-2008**

Regressant:		All Countries				Selected Countries			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Primary surplus		FGLS (linear)	OLS FE (linear)	SGMM (linear)	FGLS (quadratic)	FGLS (linear)	OLS FE (linear)	SGMM (linear)	FGLS (quadratic)
L.debt	/1	0.0578***	0.12445***	0.1279	0.1651***	.04973***	0.06253***	0.0733***	-0.0637*
L.debt^2	/2				-0.0009***				0.0011***
GDP Gap	/3	0.0987***	0.1503	0.1733*	0.1096***	.08141***	0.05428*	0.1408***	0.08147***
GEXP Gap	/4	-0.1333***	-0.1263***	-0.1575***	-0.1421***	-0.1648***	-0.16143***	-0.1843***	-0.1614***
Time trend				-0.1154				-0.1520**	1.9863
Constant		-0.4666***	-6.2689***		2.3646***	0.4789	-2.5824***		
No. obs.		417	384	384	417	126	119	119	126
No. countries		33	33	33	33	7	7	7	7
Wald Chi2		441.37		51.2582	378.23	468.5228		298.2808	453.26
DW Statistic			1.712				0.4145		
LBI Statistic			1.817				0.5666		
AB AR1				-1.0505				-50461	
AB AR2				-.97226				-41912	

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1% using Two-tailed Wald tests of zero coefficients.

FGLS = feasible generalized least squares, OLS = ordinary least squares, SGMM = System General Method of Moments.

Regression methods:

(1)(4)(5)(8): Feasible Generalized Least Squares (FGLS) estimation, allowing for country-specific autocorrelation (AR1) and heteroskedasticity. Regressors include country dummies, also interacted with debt, to allow for panel-level fixed effects (coefficients not reported here.) For the case of regressions involving the sample of all countries, debt enters at two-year averages.

(2) and (6): OLS within-estimator, allowing for fixed (country) effects and AR1.

(3) and (7): Blundell-Bond type system-GMM estimator, instrumenting lagged primary balance and debt as regressors both in levels and differences and including a time trend. Windmeijer-robust standard errors. Note that both models are likely to suffer from misspecification, as second-order autocorrelation in the residuals from first-differenced errors is not rejected.

Note that Figure 11 is based on the coefficients estimated by model (4) and Figure 12 is based on model (8).

Notes on regressors:

/1 Debt/GDP ratio, lagged 1 year (this ratio enters regressions at 2-year averages for the case of regressions involving the sample of all countries.)

/2 Squared Debt/GDP ratio, lagged 1 year (this ratio enters regressions at 2-year averages for the case of regressions involving the sample of all countries.)

/3 GDP deviation from Hodrick-Prescott trend, percent.

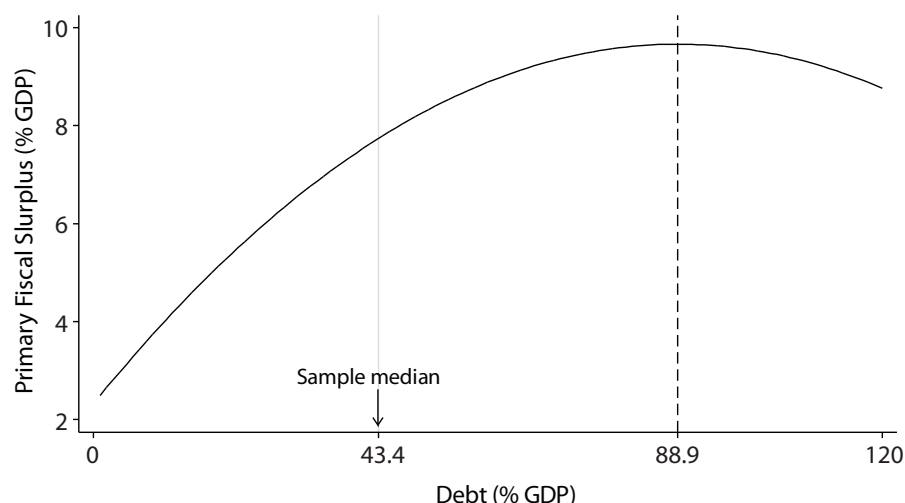
/4 Total government expenditure deviation from Hodrick-Prescott trend, percent.

Across the estimated equations for all countries in Table 2, there is evidence consistent with an average response of the primary balance to current and lagged debt ratios that lies between 0.01 and 0.064, although the coefficient in some specifications is insignificant statistically. These estimates are broadly in line with a number of other studies (IMF 2003). In no cases are primary fiscal balances found to respond perversely to rising debt in the sense of a statistically significant negative coefficient being attached to the debt ratio variable. Finally, the last few columns of Table 2 present the results for a particular subset of larger countries in the region and allows for the possibility that fiscal responses to debt may vary at different debt levels. Two broad approaches were taken to allow for such effects: In the spline approach (not reported in Table 2), debt was divided into above or below median debt ranges, and the estimates sought to determine whether the response of the primary balance differed across the ranges. In the nonlinear equation approach, allowance was made for the possibility that the response of the

primary balance to debt was described by a simple quadratic function rather than a linear response function. Overall, the results suggested some evidence of “differential” effects whereby the primary balance function either has a u shape (implying that the adjustment parameter first falls and then rises) or an n shape (implying that the adjustment parameter first rises and then falls).

The finding of a “u-shaped” fiscal response functions differs from some other studies (Mendoza and Ostry 2008, IMF 2003, which find n-shaped effects) and is potentially quite significant in economic terms (see Figures 11 and 12). Under a u-shaped function, the fiscal adjustment effort first moderates as debt ratios increase, but then strengthens when a certain critical debt ratio is reached as part, perhaps, of a wake-up call effect. Unfortunately, however, there are also countries in the region that appear to display adjustment “fatigue” or an “n-shaped” effect in which the fiscal policy responses tend to weaken as debt levels climb to very high levels in relation to GDP. In the u-shaped case, the turning point for debt is found to lie below the median debt ratio. In the n-shaped case, the turning point is found to lie above the median debt ratio.

**Figure 11: An n-Shaped Primary Balance Response Function**



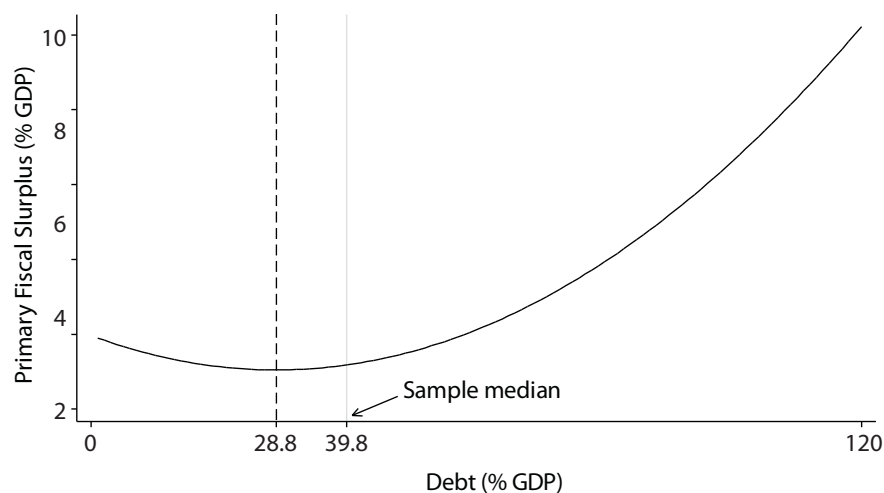
Note: Based on FGLS regression on the whole sample. Debt in 2-year averages, 1 year lag.

Based on these preliminary estimation results, three broad conclusions can be drawn:

- (i) Reflecting considerable heterogeneity across countries and over time, average fiscal behavior in the region is not easily captured by a single one-size-fits-all specification of the linkage between primary fiscal balances and debt ratios. Across the region, however, some evidence is found consistent with a statistically significant positive response of the primary surplus to debt ratios, consistent with stabilizing behavior.

- (ii) Responses of primary balances to debt ratios appear to display quite complex lag structures that differ across subregions.
- (iii) In some countries, there is evidence consistent with nonlinear responses of the primary balance to debt ratios and of the existence of debt tipping points. These may be either of the u-shape or n-shape kind with different implications for the effects of fiscal slippages on the adjustment effort.

**Figure 12: A u-Shaped Primary Balance Response Function**



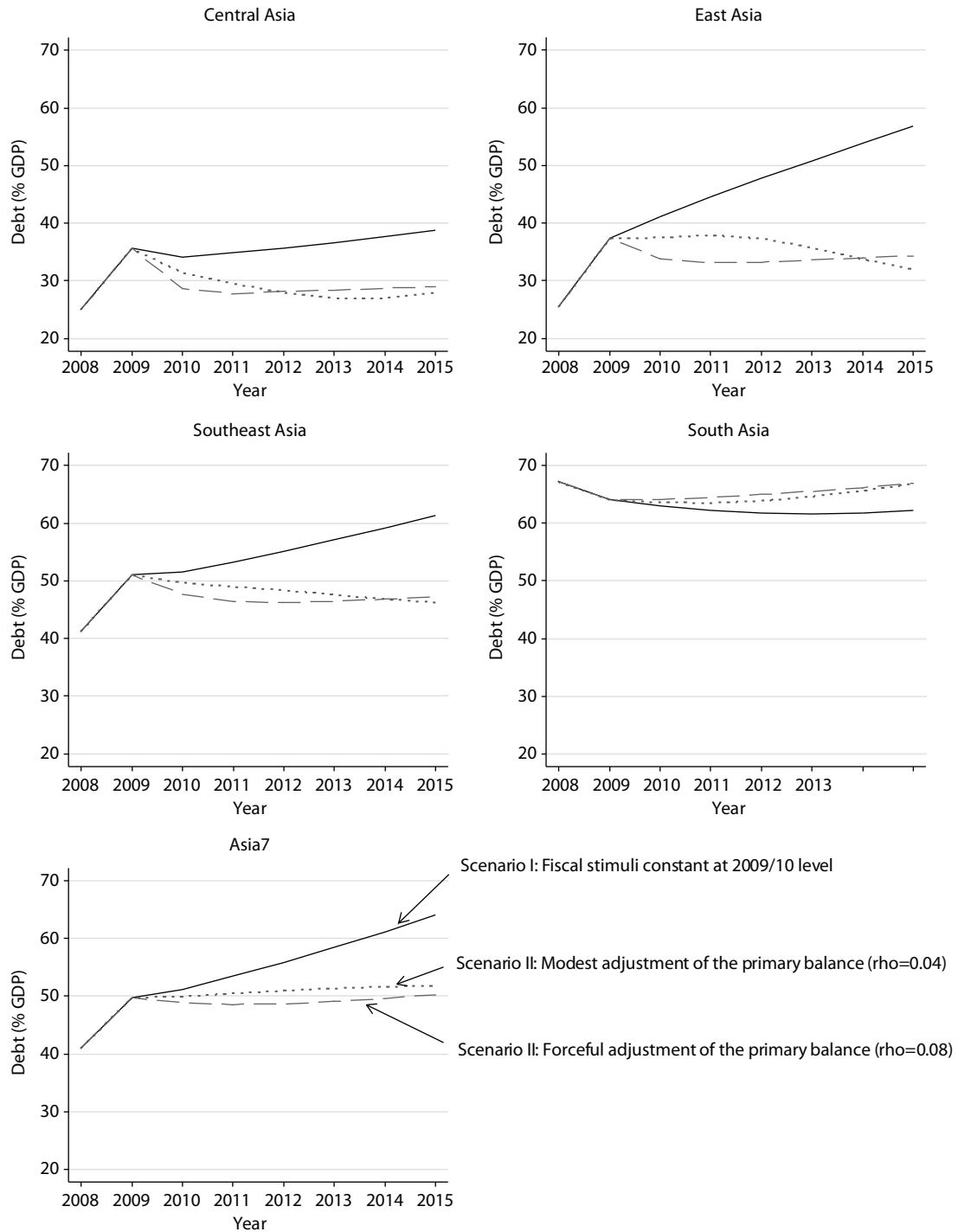
Note: FGLS regression on the small sample of seven countries. Debt lagged 1 year.

## V. Fiscal Stimulus Scenarios

This section discusses the implication for debt sustainability of the recent fiscal stimulus packages adopted in the region. Three broad “what if” or stress type scenarios are developed and applied to a selected group of countries for whom detailed projection data are available. The first scenario is based on holding fiscal stimuli constant at their 2009–2010 levels and projecting the implications for debt ratios on the basis of the forecasts for nominal GDP in the *Asian Development Outlook* (ADB 2009b) and the technical assumption that interest rates will rise gradually from their current relatively low levels in the context of monetary policy normalization. The second and third scenarios are based on the fiscal policy reaction functions estimated in the previous section and allow for the fiscal stimulus to be unwound on the basis of historical adjustment patterns. To make this scenario relevant to the heterogeneity in the region, the upper and lower bounds for the 95% confidence interval(s) for the average value of the response of fiscal policy to debt ratios in the region were used.<sup>53</sup> An upper bound of 0.08 is used to capture very forceful fiscal adjustment while the lower bound of 0.04 is used to capture much slower fiscal adjustment.

<sup>53</sup> For simplicity, the control variables in these equations are held constant.

**Figure 13: Fiscal Stimulus Unwinding Scenarios**



Note: See the text body for a description of the assumptions underlying this scenario.

Asia7 comprises India, Indonesia, Korea Rep., Malaysia, Thailand, Philippines, PRC.

The baselines for both scenarios incorporate estimates of the fiscal balances for the selected group of countries in 2009 and 2010 drawing on announced fiscal stimulus programs and budgetary data.<sup>54</sup> As indicated in the Fiscal Unwinding Scenarios included in Figure 13, a failure to unwind fiscal stimulus after 2010 would generally lead to public-debt ratios remaining high and, in some instances, rising sharply above current high levels. The key exception to this pattern is South Asia where rapid GDP growth in relation to interest rates contributes to a steady decline in the debt ratio over the projection period. Generally, therefore, delaying the removal of fiscal stimulus beyond 2010 does not present a desirable approach, especially in the case of countries with borderline fiscal sustainability that cannot easily “afford” sharp rises in debt ratios. As expected (see Figure 13), forceful fiscal adjustment generally leads to sharper declines in debt ratios than more moderate fiscal adjustment, but the dynamics of the model, along with the narrowing of the gap between growth rates and interest rates over the projection period, imply that the difference between these adjustment paths is not always very large. Intuitively, the reason for this result is that, in the near term, rapid cyclical recoveries relative to quite low interest rates imply that continued large fiscal deficits do not necessarily lead to large increases in debt ratios. Over time, however, as the gap between growth rates and interest rates tends to narrow, pressure on public debt ratios start to increase if fiscal deficits remain large.

Based on the scenario result, it is apparent most countries will need to start unwinding their fiscal stimulus packages relatively soon if they are to stabilize short-term debt and, in some cases, avoid quite sharp increases in debt ratios. Especially in countries with already high debt, the unwinding might need to go at a somewhat faster pace than in the past and, especially, in circumstances where the gap between growth rates and interest rates may be narrowing.

## VI. Medium-Term Fiscal Policy Frameworks

This section addresses issues related to the “new” fiscal policy frameworks that will be adopted in the region in the post global crisis environment. As noted earlier, the successful contribution of fiscal policy to helping the region weather the global slowdown may lead to a larger role for countercyclical fiscal policy in the future and to a range of “demands” on budgets by groups adversely affected by economic downturns. And on top of current and prospective demands on budgets related to pensions and population aging, fiscal policy in a number of countries in the region may be called upon to assist in the global rebalancing effort over the medium term. A key challenge governments are likely to face will be to reconcile a possibly more activist role for fiscal policy in the future while ensuring that the region’s generally strong record of fiscal sustainability is not put at risk.

<sup>54</sup> Effectively, in those cases where fiscal data is not available for 2009, the 2008 estimates are updated to reflect announced stimulus packages.

In addition, the possibility should be considered that maintaining fiscal sustainability may be more challenging looking forward if some of the favorable economic conditions that held in the past—including interest rates that are often well below the growth rate of the economy—are no longer assured. In such circumstances, maintaining fiscal sustainability could require more forceful policy responses to fiscal slippages than in the past, especially in those cases where fiscal sustainability is at risk, and might benefit from the adoption of strong medium-term fiscal policy frameworks that are regularly stress tested for a number of unfavorable contingencies.

Based on a wide range of experiences, strong medium-term fiscal frameworks—in which government spending, revenues, debt service and debt levels are projected over the medium term in a realistic and consistent way, and stress tested for different shocks—have proved useful for helping assure that budgets conform to fiscal sustainability (Kopits and Symansky 1998). The reason for this is that such frameworks can help identify in a timely manner whether debt ratios may be tending to rise too rapidly, and assist in framing the appropriate fiscal policy responses. In addition, many countries have found it useful to underpin such policy frameworks with “rules or limits” on fiscal policy instruments such as revenues or primary expenditures, or on outcomes such as fiscal deficits or public debt ratios. Not only can such medium-term fiscal frameworks be useful in fiscal policy formulation and implementation, they can also be important in helping buy fiscal credibility, and may pay dividends in terms of lower financing and other costs (European Commission 2009b).

Needless to say, fiscal policy rules come in many different “shapes and sizes” and there is unlikely to be a single one-size-fits-all approach applicable to all countries in the region (Buiter 2003). In addition, different countries may have different budgetary and legislative frameworks and different roles for the various branches of government in fiscal policy formulation and implementation; these will need to be taken into account in designing such frameworks. Even though directed primarily toward the medium term, such frameworks might also be of relevance in the context of the exit strategies from recent stimulus programs. Strong medium-term fiscal frameworks may help facilitate the growth friendly withdrawal of fiscal stimulus packages if the favorable effects on credibility and interest rates implied by such frameworks help crowd in private spending (Cottarelli and Vinals 2009).

The fiscal policy frameworks and rules that have been adopted in various countries around the world have differed in a number of important dimensions. Such rules can be rigid or flexible; apply to different components of the budget or to the overall budget deficit; apply to debt stocks or debt issuance; apply year by year or over the medium term; take the form of ranges or point limits on fiscal variables; and may or may not include escape clauses to deal with exceptional circumstances. In addition, such rules may explicitly allow for fiscal policy to play a countercyclical role by targeting the structural or high employment budget deficit; or they may directly or indirectly limit

countercyclical fiscal policy responses by being framed in actual rather than structural terms.

The best-known fiscal policy rules are those associated with the European Union, enshrined in the Growth and Stability Pact. The key elements of the Pact are relatively rigid upper bounds on fiscal deficits and public debt ratios (in relation to GDP) supported by a set of formal penalties to be imposed on countries that do not adhere to the rules. Fiscal policy rules, however, have been adopted in many other countries and parts of the world, and by both developed and emerging market countries. In the case of the United States, medium-term fiscal policy targets and rules played an important role in placing fiscal policy on a more solid footing in the late 1980s and early 1990s (Horiguchi 1992). Fiscal policy rules played an important role in Canada's efforts to tame exploding public debt during the 1980s and early 1990s. The United Kingdom adopted a fiscal responsibility framework in the early part of the 1980s that sought to limit the size of fiscal deficits. Examples of rules-based medium-term fiscal frameworks in Asia include the fiscal policy frameworks of India and Pakistan in the context of the need to address deep-seated fiscal weakness; the fiscal framework adopted by Indonesia in the aftermath of fiscal slippages related to the Asian crisis; and Singapore's framework for limiting fiscal slippages and protecting fiscal reserves (IMF 2009a). Both Australia and New Zealand have also adopted rules-based medium term fiscal frameworks and, across the region, many countries have adopted key elements of such frameworks as part of an effort to assure fiscal sustainability.

Looking forward, countries in the region might usefully consider strengthening and adapting their fiscal frameworks to the postcrisis world. Key elements of such postcrisis frameworks would be realistic and consistent medium-term projections for fiscal variables and debt stocks; allowance for future and prospective fiscal liabilities; stress testing against a number of unfavorable developments; formal or informal rules that lead to primary surpluses increasing in response to rising debt stocks as discussed in Section II (and which give rise to stabilizing primary balance response functions); and frameworks seeking to address the factors that contribute to debt tipping points where the fiscal adjustment effort tapers off. Such frameworks can also be designed to create the fiscal space necessary to deal with unforeseen contingencies and cyclical downturns. Policies that seek to build up fiscal space during the upswing of the business cycle will have the benefit of allowing fiscal policy to play a potentially important countercyclical role in both "good" and "bad" times. In addition, they would complement efforts in the region to limit the pro-cyclicality of financial systems through macro prudential policies, and could help reduce the amplitude of regional business cycles.

## VII. Concluding Observations

The global financial and economic crisis has fundamentally altered Asia's fiscal policy environment. Prior to the crisis, the region's traditional fiscal philosophy was one of providing growth-conducive public goods such as infrastructure and education without jeopardizing fiscal sustainability and hence macroeconomic stability. For the most part, with few exceptions such as South Asia, the outcome of this philosophy has been generally small government budget deficits and low public debt levels. Where there were temporary fiscal slippages, health of public finances had been restored quickly through speedy and decisive fiscal adjustments. One key factor underlying such generally benign precrisis fiscal and debt position was the region's reluctance to pursue countercyclical policies. This reluctance stemmed from the region's priority on maximizing output growth rather than minimizing output volatility. Furthermore, strong growth on a sustained basis in much of the region obviated the need for countercyclical policies that, in practice, refer to antirecession policies. The global crisis has brought countercyclical fiscal activism back into Asia with a thunderous bang. The unprecedented fiscal stimulus put into effect by governments across the region was borne out of sheer necessity rather than any fundamental shift in fiscal philosophy. Even so, the anticrisis stimulus may have repercussions for both fiscal policy and fiscal outcomes far beyond the crisis.

The revival of countercyclical fiscal policies in the region brings back the issue of fiscal sustainability back to center stage. Precisely because the region's governments have largely refrained from fiscal activism in the past, fiscal sustainability has not been a major policy concern in the region. However, the anticrisis fiscal stimulus packages will lead to deterioration of the fiscal and public debt positions in the short run, and may also bring about a "game-changing" shift in the region's fiscal philosophy toward heightened countercyclical activism beyond the crisis. In light of the renewed importance of Asia's fiscal sustainability in the postcrisis period, we carry out three types of empirical analysis: (i) analysis of the actual state of public finances, looking at key fiscal indicators across the region; (ii) econometric tests of fiscal sustainability, in particular estimations of fiscal policy reaction functions that measure the response of primary fiscal balances to changes in debt ratios across countries and over time; and (iii) fiscal simulations that assess the impact of the anticrisis fiscal stimulus on debt sustainability in the region. The overall balance of evidence from the first two types of analysis indicates that, although there is considerable heterogeneity across countries and subregions, by and large Asia's public finances are in relatively good shape and Asia's governments have pursued fiscal sustainability. That is, the evidence confirms the conventional wisdom that Asia has been fiscally responsible in the past. The third type of analysis finds that failure to unwind the anticrisis fiscal stimulus will seriously erode the region's fiscal sustainability.

A number of important policy implications emerge from our empirical analysis. The most immediate policy message is that regional policymakers should continue to give high priority to promoting and sustaining fiscal sustainability as they have done in the past.

Our findings imply that fiscal sustainability matters and matters a lot, and this will continue to be the case in the future. Given the popular perception that countercyclical fiscal policies played a key role in Asia's spectacular V-shaped recovery, it may be tempting to believe that Asian governments should now think more about using fiscal resources and less about sustaining fiscal sustainability. However, it is precisely because Asia has run small budget deficits and accumulated manageable debt levels that it was able to afford such large anticrisis fiscal stimulus packages. Regardless of the actual contribution of the stimulus to Asia's recovery—and this issue will not be settled for some time—the fact remains that Asia did have ample fiscal space as it entered the crisis, and this space was the consequence of a history of fiscally responsible behavior. In particular, our evidence suggests that in the past, Asian governments have made fiscal adjustments in response to deterioration of public debt positions. The primary forward-looking implication for Asian policymakers is the continued need for fiscal responsibility if they are to secure adequate fiscal space to cope with extreme shocks in the future. While the global crisis was undoubtedly unique and exceptional in terms of the synchronized and global nature of its impact, we cannot rule out the recurrence of severe regional or global crises.

The second policy message is that Asia will benefit from the adoption of strong medium-term fiscal policy frameworks that are regularly tested for a number of unfavorable contingencies. A key challenge governments are likely to face will be to reconcile a possibly more activist role for fiscal policy in the future while ensuring that the region's generally strong record of fiscal sustainability is not put at risk. A strong medium-term fiscal policy framework will be critical for meeting that challenge. Regardless of the actual contribution of the fiscal stimulus to the region's recovery, the popular perception that it played a central role may bring about a game-changing shift in the region's fiscal philosophy from its traditional conservatism toward countercyclical activism. Such a shift may jeopardize fiscal sustainability because of an inherent asymmetric bias in countercyclical fiscal policy, i.e., it is politically easier to increase spending and cut taxes during recessions than to go the other way during booms. Even in the absence of game-changing shifts in fiscal philosophy, the deterioration of fiscal positions across the region due to the anticrisis stimulus packages may have adverse implications for fiscal sustainability, and has thus rendered the need for strong medium-term fiscal policy frameworks all the more urgent. The adoption of such frameworks may also provide a more immediate benefit in so far as they can help signal that the recent fiscal stimulus programs are temporary and will not represent a threat to longer-term fiscal sustainability. And, any positive impact of frameworks on credibility about sustainability could help crowd in private spending and reduce financing costs as fiscal policy is put back on track. Strong medium-term fiscal frameworks can thus facilitate growth-friendly exit strategies from recent stimulus packages.

The third policy message emerging from our analysis is that Asian countries need to take a long and broad view of fiscal sustainability, which takes into account the region's medium-term fiscal needs over a sufficiently long time horizon. Such a view of fiscal

sustainability is closely related to and consistent with the need for strong fiscal policy frameworks, but at the same time points to the need to adapt the notion of fiscal sustainability to potentially large changes in Asia's postcrisis fiscal environment. The region has some long-standing medium-term fiscal needs such as physical infrastructure. A more recent medium-term fiscal challenge is to provide adequate pension and health care as the region rapidly shifts to an older population. A medium-term need that has arisen as a direct result of the global crisis is more spending on social protection and other areas that can facilitate Asia's growth rebalancing. Finally, given Asia's growing weight in the world economy and influence in the international community, Asia will be expected to contribute more to global public goods such as fighting climate change and poverty in Africa. For all of these reasons, even if there were no shift toward countercyclical fiscal policies, Asia may experience an increase in the role of the government. In addition, in its fiscal sustainability assessments, the region should explicitly take into account significant off-budget items and contingent liabilities, including those incurred during the crisis. For example, much of the PRC's recent bank lending surge is implicitly guaranteed by the government, which means that nonperforming loans will end up on the government's balance sheets. The broader point here is that a prospective medium-term increase in fiscal demands in the postcrisis period renders precrisis notions of fiscal sustainability obsolete in the sense that larger revenues will be required to achieve sustainability.

In a fundamental sense, even if Asia reverts to its traditional precrisis fiscal conservatism after it unwinds its anticrisis fiscal stimulus, the global financial and economic crisis has already been a game-changer for fiscal policy and fiscal sustainability in the region. Never before has the region experienced such a forceful, synchronized, and uniform fiscal response to an economic downturn. In contrast to the industrialized countries, the region is not accustomed to such use of fiscal policy for countercyclical purposes. Fiscal sustainability was a key consequence of the region's commitment to fiscal discipline and macroeconomic stability. The global crisis has highlighted a fact that has hitherto been underappreciated in the region—that fiscal sustainability is as much a valuable tool as it is a consequence. A valuable tool because it has allowed the region to unleash large fiscal stimulus programs. Somewhat paradoxically, current fiscal profligacy, which was the right medicine for the crisis, was made possible by past fiscal frugality. Given the possibility of substantial medium-term increases in government spending, Asian policymakers should also explore ways to substantially increase revenues in nondistortionary ways that do not harm growth. To some extent, the region's rapid growth will generate higher revenues but a well-designed revenue effort may still be required.

Finally, the game-changing shift in the region's fiscal landscape since the global crisis is not without some serious risks. In particular, higher government expenditures and, more generally, an expansion in the economic role of the government is often difficult to reverse or adjust even when they are no longer justified. Political considerations make it easier for governments to pursue fiscal expansion rather than fiscal contraction during

downturns. This has been evident in the experience of industrialized countries. The scope for fiscal reversal or adjustment is even more limited in developing countries with weaker institutions and policy environments. However, the need for caution does not mean that the government should refrain from rethinking and expanding its role where appropriate and justified. The crisis has shown that the government can and should serve as a consumer of last resort when all the other components of demand are stalling. At a minimum, and aside from any direct impact on growth, it is likely that the region's fiscal stimulus has helped to improve business and consumer confidence, which had cratered as the crisis intensified. Going forward, the key challenge for Asia is to redefine the role of the government and adapt it to the postcrisis world without compromising the fiscal sustainability that has served the region so well.

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**About the Paper**

Charles Adams, Benno Ferrarini, and Donghyun Park empirically examine the conventional wisdom that developing Asia has been fiscally responsible in the past. Their evidence confirms that the region's public finances are generally healthy as a result of historical fiscal discipline. Nevertheless, their forward-looking scenario analysis indicates that failure to withdraw the region's anticrisis fiscal stimulus in a timely manner may jeopardize fiscal sustainability in the future.

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ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.8 billion people who live on less than \$2 a day, with 903 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

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