

# Social Spending, Fiscal Space and Governance: An Analysis of Patterns over the Business Cycle

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UNEDITED DISCUSSION DRAFT / NOT FOR QUOTATION

APRIL 2010

## ABSTRACT

The issue of undertaking social policies as part of the countercyclical response to crises has become much more urgent in the context of the recent food price volatility and global economic slowdown. The present paper contributes to the literature in this area by analyzing the cyclicity of social spending using data for about 100 industrial and developing countries drawn from various databases spanning the period from 1980-2008. The principal aim is to examine the empirical link between indicators of the business cycle (i.e. the output gap and economic growth) and social spending, with a main focus on subcomponents of the latter in education and health spending. The empirical results suggest that public education spending appears acyclical, and health spending procyclical, in lower- and middle-income developing countries. This pattern appears reversed in low income countries. On the other hand, high income countries appear to have acyclical or countercyclical public education and health spending. Based on this evidence, the challenge for developing country policymakers is to manage and channel the necessary spending and investments in the social sectors—notably in the supply of key services in education and health—in a much more effective way over the business cycle in order to strengthen the resilience of children, women and poor families against the vicissitudes of the business cycle. This will likely require a combination of policy and institutional innovations at the national level, as well as innovative financing mechanisms at the international level.

JEL Code: E-62; H-50; O-23

Key Words: business cycle; governance; social spending; fiscal space; countercyclical fiscal policy

\*The views expressed in this paper are the authors' and do not necessarily reflect those of the United Nations Children's Fund (UNICEF). For very helpful comments, the authors thank participants at the 26th Conference of the American Committee for Asian Economic Studies (ACAES), "Asia after the Crisis" held March 5-6, 2010 in Kambai-kan Hall, Doshisha University, Kyoto, Japan. This paper is part of UNICEF's broader social and economic policy work to analyze public finance policies in order to advance children's rights. Questions and comments on this draft could be directed to Ronald Mendoza ([rmendoza@unicef.org](mailto:rmendoza@unicef.org)) and Nadia Doytch ([ndoytch@newhaven.edu](mailto:ndoytch@newhaven.edu)).

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## Introduction

It is well known that market forces do not always work to achieve socially optimal resource allocations, often resulting in underinvestment in the social sectors. However, when efficiently and effectively deployed, public sector spending and investments in the social sectors could play a critical role, notably in fostering long-term human and economic development as well as poverty reduction (Baldacci and others, 2008; Fan, 2009; Moreno-Dodson and Wodon, 2008).<sup>1</sup> In addition, during times of economic volatility, enhanced social spending could channel resources to households and sectors that are most vulnerable. This could be motivated by two main goals. First, they help ensure adequate social protection and other interventions that could mitigate the adverse human development implications of aggregate shocks, ensuring that crises do not generate long-term harm to children, women and poor families. Second, a surge in social spending could also form part of countries' countercyclical policy response, protecting and strengthening human capital and other investments, as well as fostering robust social and economic recovery.

Indeed, recent empirical studies focused on industrialized countries find evidence that countercyclical social spending not only could help smooth income shocks—these could also achieve it more effectively than government spending as a whole (Furceri, 2009). Nevertheless, crises in developing countries are often accompanied by public spending cuts. Often, social spending suffers the worst cut, and within social spending that part which is most pro-poor is most retrenched. Political economy considerations offer a possible explanation for this pattern: the poor are often those with weakest political voice, and the middle income segment of society often shoulder the brunt of the tax burden and are relatively more influential in political discourse. Inadequate access to external credit markets and poor macroeconomic and crisis response and recovery management could also be contributing factors. The cyclicity of social sector spending and investment is therefore an empirical issue.

The issue of undertaking social policies as part of the countercyclical response to crises has become much more urgent in the context of the recent food price volatility and global economic slowdown. Most expect that the presently unfolding global economic slowdown will exacerbate poverty, hunger and malnutrition in many parts of the developing world. Even as international food prices have relaxed, these have nevertheless remained higher than their long run trend. In many developing countries, economic contraction has occurred on top of persistently high (and in some cases rising) food prices. The UN's Food and Agriculture Organization (FAO) recently reported that over 1 billion people in the world will be hungry and undernourished in 2009—about 100 million more over the previous year (FAO, 2009).<sup>2</sup> The World Bank's latest estimates predict that as a result of the crisis the number of people living in extreme poverty will increase by as much as 50 million more people in 2009, and another 64 million by the end of 2010.<sup>3</sup> Recent World Bank and UNICEF research suggests that there is a high risk that the crisis could undermine recent progress in the reduction of infant mortality (Friedman and Schady, 2009;

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<sup>1</sup> The rest of this paper will refer to social spending as that which focuses on the public sector's spending and investments in the social sectors. Since there are few over-all measures of aggregate social spending, this paper will turn to various sub-components, notably public (central government) spending on education and health.

<sup>2</sup> Another estimate suggests that there could be an increase in the global undernourished population by up to 41 million due to the global economic slowdown in 2009. This is in addition to the increase by 63 million in undernourished due to the food price crisis the year before (Zaman, 2010b:17).

<sup>3</sup> World Bank (2010:41).

Mendoza and Rees, 2009). According to the evidence, in many parts of the world girls are particularly at risk. If there is inadequate policy action, tens of thousands of children in some of the poorest countries in the world could die, paying the ultimate price as a result of this crisis. Over-all, the crisis raises the risk that recent gains in human development—notably improvements in the wellbeing of children—could be reversed.

Unless the appropriate pro-poor policies are undertaken, economic recovery is not necessarily going to be inclusive, nor are its benefits automatically going to trickle-down to the poor. There are a variety of measures to help ensure this, and all are germane to the design of the policy interventions—notably the countercyclical responses (or lack thereof)—of the government. The social and economic impacts of stabilization programs themselves are checkered.<sup>4</sup> In past crises, the social sectors were typically among the ones that remained stagnant or were retrenched, at precisely the time when more people were falling into poverty and already existing poor were falling deeper into destitution. A strong case could be made to break from these past policies, and instead try to emphasize pro-poor stabilization policies, or put differently, “countercyclical safety nets”.<sup>5</sup>

The present paper contributes to the literature in this area in two ways. First, it analyzes the cyclicity of the subcomponents of social spending, by examining public spending in education and health using a comprehensive dataset covering about 100 industrial and developing countries spanning the period from 1980-2008. Seeking to assure consistent and comparable data as much as possible, the authors compiled this dataset by drawing on various sources, including the World Bank and UN-ECLAC. To the authors’ knowledge, it is by far the most comprehensive dataset on public education and health spending that has been analyzed. The authors are careful to point out here that the analysis is not meant to reflect on aggregate social spending in general, since the focus of this paper is only on public education and health spending. Nevertheless, these components are important factors in the broader countercyclical social policy response to crises, as will be explained shortly.

The principal aim of this paper is to examine the empirical link between indicators of the business cycle, i.e. the output gap and economic growth, and social spending, with a main focus on subcomponents of the latter in education and health spending. The significance of focusing on these two areas lies in the fact that these likely indicate the supply of public social services over the business cycle. The recent focus on boosting cash transfers during crises focuses mostly on the demand side, which is important, but may suggest an imbalance if the supply side is not strengthened (Mendoza, 2010). This paper analyzes whether and to what extent the supply of education and health services (proxied by the amount of public resources channelled to these) seems to receive adequate attention.

In addition, this paper also examines the possible factors that might help explain social spending patterns, accounting for indicators of fiscal space (e.g. reserves, tax base, access to external finance and foreign aid, etc.), governance (e.g. government stability, corruption, etc.) and other contextual variables (e.g. dummy indicators of conflict, crises, etc.). Hence the main empirical questions of interest include:

1. Is public spending in education and health countercyclical?

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<sup>4</sup> For a detailed discussion, see for example Vreeland (2006) and the evaluations produced by the Independent Evaluation Office (IEO) of the International Monetary Fund (<http://www.ieo-imf.org/>).

<sup>5</sup> See among others Alderman and Haque (2006), Mendoza (2009a,b) and Ravallion (2008).

2. Are more stable and less corrupt governments more likely to undertake countercyclical social spending?
3. Is there a difference in the pattern of social spending across its subcomponents in education and health?

The answers to these questions could help clarify whether and to what extent developing country governments allocate resources in ways that help to boost the social sectors when resources there are most needed. The approach of disaggregating social spending into its education and health spending components could also help to identify potentially distinct patterns across different country income groups. The analysis might also help to clarify whether the requisite fiscal space—when and where available—is actually being deployed to invest in education and health, and boost the supply of social services in these areas. All of these aspects have yet to be examined in greater detail in the literature.

In what follows, section 1 briefly reviews the relevant empirical literature, while section 2 outlines the data and methodology for the empirical analysis in this paper. Section 3 then reviews the key empirical results. A final section contains the main conclusions, and tentative policy messages.

## **I. Review of Empirical Literature**

There is by now a rich literature examining the cyclicity of public spending in both industrial and developing countries. Typical empirical studies here use annual aggregate data in order to examine the link between some measure of government spending (e.g. the budget balance) and some measure of the business cycle (e.g. the output gap). The crux of the evidence in this area suggests that in industrial countries, fiscal policy is countercyclical, while in developing countries, it is procyclical or acyclical. The two main theories explaining the main findings in this literature are that:

- a) International credit markets are imperfect and prevent countries from borrowing in bad times (in turn leading to a lack of capacity to undertake countercyclical policy); and,
- b) Political economy issues amplify the tendency for fiscal profligacy and rent-seeking activities (e.g. there are strong domestic interest groups that push for higher spending in some sectors during boom times, as well as weaker voice for some sectors, notably the poor, so that during periods of contraction programs benefiting them are vulnerable to cuts).<sup>6</sup>

Earlier approaches have been critiqued by Ilzetski and Vegh (2008) who outline possible problems of reverse causality in these earlier studies. That is, the expansionary effect of fiscal policy could be misidentified, leading to a spurious empirical finding. These authors address this issue through a battery of empirical tests and identification techniques, including instrumental variables,<sup>7</sup> GMM, simultaneous equations and time series methods (e.g. Granger causality and impulse response methods) using quarterly data for 49 (27 developing and 22 industrial) countries going as far back as 1960 for some countries. Their general finding is that developing countries do indeed exhibit procyclical fiscal policies, i.e. government spending is positively linked to an

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<sup>6</sup> See among others Alesina et al (2008), Gavin and Perotti (1997), Talvi and Vegh (2005).

<sup>7</sup> For instance, in addition to other possible instrumental variables, they use the weighted GDP growth of countries' trading partners as an instrument for GDP.

exogenous expansionary business cycle shock. However, for industrial countries, their findings are mixed.

The focus of the present paper is on a more specific strand of literature which examines social spending patterns as a potentially distinct policy from the over-all fiscal stance. In practice, the over-all public sector could be increasing even as social spending could be decreasing—and alternatively, social spending could be increasing even as the over-all public sector could be contracting (through a re-prioritization of social sector spending and investments).<sup>8</sup>

As briefly mentioned in the introduction to this paper, there are at least two possible rationales for maintaining a countercyclical social spending policy—one is rooted in social justice and/or human rights arguments to protect the most vulnerable (and often also least culpable in the context of a financial or economic crisis); and the other is based on a human development and growth rationale:

- ***Protecting the poor.*** Essentially, the argument here is to boost resources in the social sectors at precisely the time that social services are most needed, in turn offering stronger social protection during economic downturns. During crises, for example, many households switch from private to public education, health and other services. This trend and other heightened risks faced by vulnerable population groups<sup>9</sup> tend to place a greater strain on public social services. It is also likely that pre-existing resource allocations are barely enough or are even inadequate, suggesting that inflation (often an accompanying symptom of financial crises) and rising demand due to more people falling into poverty (and more severe poverty all around) could erode service providers' capabilities in real terms, if additional resources are not forthcoming.<sup>10</sup>
- ***Preserving long-term human and economic development prospects.*** Another set of arguments has to do with ensuring prompt economic recovery and preserving the country's human and economic development trajectory. Because crises could undermine human capital accumulation, it is possible to advance an argument that seeks to preserve if not boost investments in this area, under social and economic recovery grounds. The quality of recovery could also be much more effective if countercyclical policies target the poor and low income segments of the population. They are more likely to spend rather than save additional resources, and they are also more likely to face the greatest immediate need to boost their consumption, suggesting that the stimulus effect may be much larger and much more effective if targeted at this group.

Unlike the abovementioned literature on fiscal policies, the literature examining the cyclicity of social spending more specifically is less extensive. A recent paper by Darby and Melitz (2008) is among the few to formally analyze the pattern of government spending over the business cycle. They examined both aggregated and disaggregated government social spending data for OECD countries and find that age- and health- related social expenditures react to the

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<sup>8</sup> These statements could be interpreted in various ways, including when measuring these variables in real terms, as a share of total public spending, or as a share of GDP. In the present paper, our focus is on scaling as a share of GDP in order to arrive at some sense of the total magnitude of spending relative to the size of the economy which is the convention in the literature.

<sup>9</sup> For instance, there may be a greater need to offer child protection services to help prevent abuse and violence against children and youth during crises when there may be a greater risk of exploitation.

<sup>10</sup> This could also form part of the argument to boost social protection by focusing on the supply side. On the other hand, demand side initiatives may include efforts to provide tax relief, subsidies or cash and in-kind transfers.

business cycle in a stabilizing manner. Their empirical findings suggested an elasticity of total social spending to the output gap equal to 0.5, implying that social spending could act as part of the automatic stabilizer.

In addition, Furceri (2009) used data on 23 industrialized countries from 1980-2003 in order to examine the extent to which social spending could help absorb shocks to GDP. Essentially, they estimated the percentage of shocks to GDP smoothed through different channels (e.g. international net transfers of income factors, consumption smoothing and government spending) and, more specifically, items of social spending. They found evidence that social spending could be used to smooth anywhere from 12 percent to 23 percent of a shock to GDP (ibid:12). The stabilizing effect of social spending is also larger in countries with more extensive social spending. While this study did not examine this aspect, it is also possible that lower income families are more likely to spend rather than save, facilitating a more robust stimulus effect.

Nevertheless, evidence from past crises often point to a contraction in social spending at precisely the time when the need is greatest. For instance, during Mexico's *Tequila crisis* in the mid-1990s, Cutler and others (2002:280) noted a key policy paradox: "Countries experiencing economic crises have found that they reduce the ability to provide social services to the poor, just as the needs of the poor increase." Per capita public health expenditures in Mexico fell by about 15 percent during the period 1994-1996.

Furthermore, Ravallion (2002) examined Argentina's budget trends in the 1980s and 1990s—periods which were marked with economic volatility—and he found evidence that non-social sector spending tended to be better protected against cuts during downturns, when compared with social spending. Spending on targeted social assistance and employment programs was also much more vulnerable to aggregate spending cuts, compared to more universal social services. Social spending in general and social spending targeted at the poor in particular were typically cut during periods of fiscal austerity.

A political economy explanation would emphasize that programs that are targeted at the poor are vulnerable to cuts, because the poor are often those with weakest political voice, and the middle income segment of society often shoulder the brunt of the tax burden and are relatively more influential in political discourse. The latter group would tend to support protecting programs that benefit them more (or perhaps cutting taxes that fall more heavily on the middle class, in turn leaving fewer resources for social programs). To shed light on whether government programs targeted specifically at the poor were more vulnerable to cuts, Ravallion also examined the pattern of expansion and contraction in the funding for Argentina's *Trabajar* program, whose aim is to reduce poverty by providing relatively low wage work on community projects in poor areas.<sup>11</sup> He found evidence that the program expanded into poor areas when the budget increased, but it retreated from poor areas when the program was cut (ibid: 119). Ravallion's analysis thus suggested a possible "catch-22" in terms of better targeted and explicitly pro-poor programs: while they clearly offer stronger benefits for the poor, these programs are also much more vulnerable to the vicissitudes of political deliberations, notably during periods of contraction.

Governance issues are at the core of effective macroeconomic policies—decisionmaking on and execution of the budget at various levels of government are no exceptions. Whether and to what extent governments manage fiscal space well, and decide to deploy this space for

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<sup>11</sup> Under the *Trabajar* program, the central government covers the wage costs, while other costs are covered by local or provincial governments.

investments in the social sectors, are therefore among the key issues that need to be examined. The literature on the political economy of debt policy is illustrative in this regard. According to the contributions to this strand of work, political uncertainty could be associated with higher levels of external debt (e.g. governments will think simply of the immediate term); and corruption could lead to procyclicality in public spending and windfall revenues (e.g. windfall revenues open the door for opportunities for more rent-seeking).<sup>12</sup> For instance, in a recent paper by Arezki and Bruckner (2010), they examined the impact of commodity price shocks on external debt management in a sample of 93 countries spanning the period 1970-2007. They found evidence that positive commodity price shocks are associated with reduced external debt in democracies,<sup>13</sup> while in autocracies, there is less evidence that windfalls are translated into lower external debt levels. This suggests that countries with weaker governance may tend to be in a perennial position of having relatively less capacity to undertake countercyclical and crisis response policies.<sup>14</sup>

On the issue of governments' capacity to respond to shocks through fiscal policies, another strand of literature has begun to focus on analyzing policy instruments that could enhance governments' ability to undertake countercyclical social spending.<sup>15</sup> Gonzales and Paqueo (2003), for example, examined the functioning of rainy day funds in the United States (US)—funds designed to provide resources for social spending during times of need—to see whether these instruments could help stabilize social spending. Between the period spanning the early 1980s and into the mid-1990s, rainy day funds were introduced by a growing number of states in order to achieve budget and social spending stabilization objectives. Rainy day funds increased from only a handful of states in the beginning of this period to over 45 states by the end of it (Gold, 1984; Knight and Levinson, 1999). Gonzales and Paqueo used annual data on US states with rainy day funds and analyzed the empirical link between the volatility of social spending (e.g. elementary and higher education, Medicaid, and cash assistance programs) as the dependent variable, and as independent variables, the volatility of gross state product, the rainy day fund balance and other state fixed effects. They found evidence that one additional dollar in the rainy day fund balance is associated with a decreased volatility in social sector spending by about 34 cents (*ibid*:1). Rainy day funds, however, were not associated with more stable over-all budgets, suggesting that broader fiscal policy strategies are necessary in order to achieve that goal.

## II. Data and Methodology

### *Data*

Our primary data source for public spending and other variables is the World Development Indicators dataset (World Bank 2008). Countries are classified into four groups according to World Bank classification: low income, lower middle income, upper middle income, and high income countries. We supplement this dataset with social expenditure data from the Economic

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<sup>12</sup> See among others Alesina and Tabellini (1989) and Alesina et al (2008).

<sup>13</sup> Further information on how democracies are measured using the Polity IV database could be accessed here: <http://www.systemicpeace.org/polity/polity4.htm>.

<sup>14</sup> In a related paper, Arezki and Ismail (2010) examine evidence suggesting that oil price busts were not accompanied by a commensurate decline in the real exchange rate. The authors attribute this to possible political pressures skewing policy choices toward increases in public expenditures during boom times rather than cutting these during periods of decline, thus leading to the real effective exchange rate remaining elevated even after a decrease in commodity prices.

<sup>15</sup> For a comprehensive review of the policy instruments for achieving macroeconomic stabilization in emerging market economies—including some which promote countercyclical social spending—see Mendoza (2009c).



Commission for Latin America and the Caribbean (ECLAC 2009). The initial dataset on public spending in education covers over 200 countries during the period 1980-2008. However, the exact number in each regression contains a smaller sample size due to missing datapoints and restrictions in data availability in the other variables (as well as the variable on public spending in health). In the main analysis, the focus is on regressions which cover 99 countries examining public education spending and on 102 countries examining public health spending.

For measurements of governance quality, the authors turn to the International Country Risk Guide data (Political Risk Group 2009). Their rating is based upon three categories of risk: political, financial and economic. Given the focus of this paper, data on political risks is used, and in particular, the focus is on the indicator on the control of corruption. Annex tables 1 and 2 provide descriptive statistics of the main variables used in the analysis. Annex table 3 contains the list of countries under each income category (i.e. low, lower middle, upper middle and high income categories).

### ***Methodology***

In order to analyze the cyclicity and dynamic pattern of public social spending, the authors estimate the following empirical model which builds on earlier approaches in the literature:

$$s_{it}^k = \beta_0 + \beta_1 g_{i,t-1} + \beta_2 g_{i,t-1} q_{i,t-1}^j + \beta_3 x_{it} + \beta_4 D^t + \mu_i + \varepsilon_{it}$$

$$\mu_i \sim i.i.d.(0, \sigma_{\mu}), \varepsilon_{it} \sim i.i.d.(0, \sigma_{\varepsilon}), \text{ and } E[\mu_i \varepsilon_{it}] = 0$$

where  $s_{it}$  is public social expenditures,  $g_{i,t-1}$  is the lagged output gap. (As a robustness check, the authors also run the same regression using lagged real GDP per capita growth to replace the output gap variable.) The term  $g_{i,t-1} q_{i,t-1}^j$  is a cross term of the lagged output gap (or the lagged real per capita GDP growth)  $g_{i,t-1}$  and a quality of governance variable. The superscript  $k$  stands for a *social expenditure index* ( $k$ =public spending on education and healthcare), the superscript  $j$  stands for a quality of governance index (i.e. control of corruption, government stability, and bureaucracy quality) and the subscripts  $i$  and  $t$  describe, the cross-sectional and time dimensions of the panel data, respectively. The row vector  $x_{it}$  consists of the most commonly used control variables in the literature, comprising a quality of governance variable, foreign aid expressed as a share of GDP, net transfers from abroad expressed as a share of GDP, foreign portfolio investment (an aggregate for equity and bond investment) expressed as a share of GDP and tax revenue expressed as a share of GDP.  $D^t$  is a row vector of 29 year-dummy variables and  $\mu_i$  is a country fixed effect term.

In lieu of the standard OLS approach, the fixed effects (FE) method is more appropriate for the main analysis in this paper. The method of fixed effects is designed to control for the unobserved country-specific time-invariant effects in the data. It corrects for the possible correlation between these effects and some of the independent variables, conditioning them out by taking deviations from time-averaged sample means. The result of applying such a procedure is that the dependent variable is stripped of its long-run variation—an approach which may be appropriate for studying fluctuations in social expenditures around their growth trend. The conceptual issue with the method is whether social expenditure fluctuations are more similar within than across countries. If so, the within-country variation may not be enough to capture the full effect (Pritchett, 2000a). The within estimator also faces some limitations when the dependent

variable has little time variation. The lost long-run variation is alternatively captured by the “between” estimator.

### ***Variables of Interest***

#### *Indicators of the Business Cycle*

The indicator of the business cycle is the main variable of interest in the analysis. Specifically, the authors turn to two measures of the business cycle. The first is widely used in the literature and refers to the output gap, which is defined as the difference between the trend GDP and actual GDP. The authors follow the convention in the literature for estimating trend GDP using the HP-filter. The second indicator is economic growth. The estimated link between the output gap (or economic growth) and public social spending in education and health can help us answer the empirical question whether developing countries tend to have procyclical public social spending whereas the developed countries tend to have countercyclical public social spending as reflected in the literature. In the main analysis, the authors turn to the model specifications using lagged output gap (or lagged real GDP growth) in order to address potential endogeneity issues. Essentially, an economic downturn could limit the government’s capacity to undertake countercyclical policies. However, countercyclical fiscal (including social spending) policies could also counteract the downturn by helping to boost the economy. Estimation of contemporaneous values could lead to spurious results, so the authors turn to lagged values of the independent business cycle indicators.

#### *Quality of Governance*

Both stylized facts and empirical evidence (Gupta et al, 1999; 2001) suggest that the quality of governance may affect the fiscal decision made by the government. For example, in countries with weaker indicators of governance, public expenditure may be biased towards some sectors that are more conducive to rent-seeking or are the subject of more intense lobbying. On the other hand, the social sectors may tend to receive relatively less emphasis, particularly if poor and low income people are unable to organize themselves to lobby more effectively for better quality and quantity of public services. Weak institutional capacity and corruption can also diminish the effectiveness of any given amount of resources allocated to the social sector. Even if the public resources are allocated for social services, social spending may fail to be realized due to inappropriate execution and monitoring of the public budgeting process (Deles et al, 2009).

The quality of governance is based on the indicators in the Inter-Country Risk Guide published by the Political Risk Group. As mentioned earlier, in countries with weak institutions, it is much less likely that adequate resources will be allocated to the social sectors, and even resources that do get allocated may not necessarily be channelled most effectively through the government bureaucracy and into social investments items such as textbooks, school construction, and medical supplies. Better quality of governance is represented by a higher value taken by the indicator. For example, a higher value of the corruption indicator implies better control of corruption by the government. The authors include an interaction term between the output gap variable and the control of corruption variable, in order to examine whether the presence of lower corruption may be associated with a more countercyclical social spending response. In the main analysis, the interaction term uses the lagged values for both variables, with the expectation that their main effect would be on next year’s budget. As a robustness check, the authors also turn to an analysis of other governance indicators, including the indicator for government stability and the indicator for bureaucratic quality.

### *Determinants Related to Fiscal Space*

The approach controls for other economic factors that affect fiscal space or the scope and ability of governments to implement their fiscal policies. These factors include: foreign aid as share of GDP, portfolio investment in bonds and equity as share of GDP, net foreign transfers from abroad as share of GDP, and tax revenue as share of GDP. Among these control variables, foreign transfers may not only have an income effect on the fiscal capabilities of the recipient country, but also influence the prioritization of public spending. Therefore, such variables related to fiscal space are potential determinants of public social spending. For instance, Hagen and Hatlebakk (2002) find that the most generous bilateral donors have a significant impact on the budget shares of social sectors using targeted aid.

Apart from the above factors, it is also likely that there are other economic or political determinants of fiscal choice, such as regime and political transitions. The fixed effects method is expected to account for these context-specific factors that vary across countries.

### **III. Empirical Results**

Tables 1-5 present the results for the regressions with public spending in education as the dependent variable. Tables 6-10 summarize the regression results wherein public health spending is the dependent variable. For the entire analysis, the main focus is on the coefficient of the output gap, an indicator of the business cycle used in the literature.

**[INSERT TABLES 1-10 HERE...]**

Tables 1 and 6 represent the results for the full industrial and developing country samples in the analyses of public education spending and public health spending respectively. The regression results for the full set of variables suggest that the lag of the output gap is negatively linked to public spending in education and health (see last column in tables 1 and 6). Nevertheless, a note of caution is appropriate, given that the significance of this coefficient is sensitive to the model specification.<sup>16</sup> The interaction term between the lag of the output gap and the lag of the corruption control variable is positive and significant in both cases, even as the significance of this coefficient appeared sensitive to the model specification and addition of other control variables for fiscal space.

The empirical results for low income countries (tables 2 and 7) indicate that public education spending is procyclical, while public health spending is acyclical. The interaction term between lagged output gap and lagged corruption control has a positive and statistically significant coefficient only in the public education spending regressions (table 2), while there is no evidence of statistical significance in the public health spending regressions (table 7). The evidence that control of corruption in low income countries tends to be associated with higher

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<sup>16</sup> Indeed, some caution is necessary in interpreting all the results, given this sensitivity to model specification. The authors take comfort in the battery of specifications (some of which are not reported in this paper due to space constraints) to try and establish some robustness to the results.

public spending in either education or health appears mixed, and these are sensitive to model specifications. The evidence on the links of public education and health spending, respectively, to various indicators of fiscal space is also not compelling. However, they are considered useful and kept in the model to the extent that they help to control for the possible influence of available fiscal space for implementing social spending policies.

The results for lower- and upper- middle income countries suggest that public education spending appears acyclical, and health spending procyclical, in lower- and middle-income developing countries—the reverse of the pattern observed in low income countries (see tables 3 and 4 for public education spending and tables 8 and 9 for public health spending). The authors can only speculate as to the possible reasons behind this interesting pattern differentiating low from middle income countries. One possibility is that, on average, the public-private balance of the education and health sectors across most low income countries differs substantially from that of middle income countries. It is also possible that the political economy behind public education spending is different from that of public health spending. In poorer countries with possibly less progress in promoting education access, it is possible that the sector may be much more vulnerable to fiscal consolidation. However, in less poor countries which have achieved relatively more progress in promoting education (including among the more political active generation), then the resistance to public education spending cuts may be stronger, perhaps more organized, and possibly more effective.

Finally, the regressions involving high income countries appear to show acyclical public education and health spending patterns. These results do not fully conform to our expectation that more industrialized (and possibly better governed) countries will likely exhibit a stronger countercyclical public spending policy in education and health. However, a possible explanation is that more developed access to financial and insurance services in richer countries could help to alleviate the need for a much stronger public sector response to downturns. Essentially, people could continue to opt for privately provided education and health services, to the extent that temporary income shocks are covered by insurance mechanisms. Similarly, boom periods may not necessarily lead to excessive increases in public spending due to stronger institutions and fiscal restraint.

As a robustness check, the authors also run regressions using the economic growth variable in lieu of the output gap variable (see tables 11a and 11b for the education and health regressions respectively). They also turn to a wider set of governance indicators, spanning control of corruption, bureaucracy quality, and government stability. This adjustment does not materially change the main findings for developing countries. Over-all the developing countries still appear to exhibit either acyclical or procyclical public spending patterns in the areas of education and health. On the other hand, the regressions using economic growth do produce results suggesting that high income countries follow countercyclical public education and health spending policies.

#### **IV. Conclusion**

Interesting patterns emerge in the empirical analysis of the cyclicity of public education and public health spending across industrial and developing countries. The results suggest that education spending is procyclical and health spending is acyclical in low income countries—a pattern that is reversed when one examines the results for lower- and upper- middle income countries. High income countries tend to exhibit acyclical patterns for public education and health spending. While the results are tentative, this assessment is presented here based on a pattern that seems to emerge from a series of reasonable model specifications.

Over-all, the findings in this paper suggest that boosting social services—be it in education or health—during a downturn remains an important challenge in many developing countries. The evidence presented in this paper suggests that public spending in education and health are historically procyclical in different parts of the world. As noted earlier, the recent focus on boosting cash transfers during crises signals an increasing focus on boosting the demand side of social spending and investments. By providing cash to poor families (and in some cases targeted at women), the necessary spending and investments could be made in child and maternal health, as well as education, food and other goods and services critical to human development. During a crisis, this relaxation in the budget constraint of poor families could spell the difference between life and death, notably for the most vulnerable children. While efforts to boost demand are welcome and helpful, it is also critical to consider the adequate provision on the supply side of social services, notably in places where the market malfunctions or excludes the bulk of the poor and low income population. Providing cash to poor families, while at the same time allowing social services such as education and health to weaken, will unlikely achieve the objective of protecting children and safeguarding gains in human development during a crisis.

In future research, these results could be compared against more contextualized studies of public education and public health spending over the business cycle, and notably during boom periods and downturns. There are several main areas for further exploration. First, the findings in this paper point to the possibly different patterns across various subcomponents of social spending. It is possible that education and health services are being retrenched even as cash transfers to ensure better education and health investments in children are being pursued. This is unlikely to produce better outcomes for children and poor families given that the former likely undermines the latter policy.

It would be critical to analyze the subcomponents of social spending, to help ensure that both demand and supply sides are adequately boosted according to country context and need. In the recent crises that erupted in 2008-2009, spending on social protection has been boosted in a number of countries (see box 1), and it is not clear whether these are directly linked to the budgets for public education and public health spending. It is likely that the bulk of this spending is not, and thus a fuller analysis should necessarily include it. Further data and analyses on social protection financing are therefore necessary. Second, it is also possible that a significant portion of the countercyclical social policy responses in recent years is funded by local governments in a growing number of developing countries. Hence, an analysis of local government spending as well as central government support for social sector spending at the local government level will help shed light on this angle.

Finally, it would also be useful examine more specifically the components of different countries' countercyclical social policies in order to shed light on the quality (rather than just the quantitative or monetary size) of their policy responses in this area. The recent crises that erupted in 2008-2009 potentially provide a number of useful case studies in this regard. For example, in the run-up to the crises, Chile's structural surplus target (equivalent to 1 percent of GDP) enabled

it to accumulate assets to help address its debt challenges as well as meet future public sector commitments. This could be considered a policy innovation which helped Chile better respond to aggregate shocks.

By late 2008, Chile had accumulated resources owing to the recent boom period of higher copper prices, and its Economic and Social Stabilization Fund (previously called the Copper Buffer Fund) and the Pension Reserve Fund had been well-stocked with resources amounting to 18 percent of GDP (Ffrench-Davis, 2010:9). Chile was therefore well positioned to undertake a strong counter-cyclical policy when the crisis broke out in 2008-2009. In 2009, Chilean policymakers put together a 14.5 percent growth in public spending even though fiscal revenues fell by 23.4 percent that same year. A key component of its stimulus was the direct transfer of around \$80 to each family dependent among the country's low income families, benefitting some 4 million people (ibid:12).

Similarly, Brazil was able to carve out fiscal space for its countercyclical fiscal policies in 2008-2009 owing in large measure to the \$210 billion in reserves it had accumulated before the crisis. As part of its stimulus package, it increased its transfers through social security benefits, unemployment insurance and the minimum-income program *Bolsa Familia* from a total of 6.9 percent to 8.6 percent of GDP (Barbosa, 2010:2). Policymakers also took the opportunity of the crisis to introduce a structural response to the country's housing challenges by introducing *Minha Casa, Minha Vida Program* which seeks to provide subsidized housing to some 1,000,000 poor and lower-middle-income families (ibid:8). This program was essentially a win-win, since it not only addressed a long-term challenge in the country's housing sector, it also boosted the stimulus package in a way that was much more labor intensive and pro-poor.

Nevertheless, it is critical to consider that some national policies are likely to be sub-optimal from a risk management viewpoint. Risk pooling which may take the form of regional as well as multilateral approaches to crisis financing (e.g. system of bilateral currency swap arrangements, crisis lending facilities among the multilateral development banks and IFIs) may offer countries cheaper and more effective means to ensure the availability of liquidity during a crisis, and preserve fiscal space for mounting countercyclical social spending policies. Some of the steps countries have unilaterally taken—notably hoarding reserves serving as “rainy day funds”—amount to very costly self-insurance strategies. There are better ways to manage macroeconomic and other types of risks, and there is a strong case for enhanced international cooperation, both at the regional and multilateral levels, to explore and facilitate the broader use of these types of instruments (Mendoza, 2009c).

These and other policy developments in recent years signal the growing emphasis on undertaking countercyclical social spending and policies in the developing world. Further research in this area could yield more insights as to the design and effectiveness of these types of policy interventions.

### Box 1. Selected Social Protection Policies during the 2008-2009 Crises

A brief review of selected social protection responses to the economic crisis suggests that many developing countries are boosting their social protection programs not just in response to the present crisis, but also with a long term view to the transformative, poverty and inequality reduction, and safety net aspects of their social protection systems.

- **Brazil** boosted its *Bolsa Familia* social protection program by increasing cash transfers to existing poor beneficiaries by some 10 percent and then increasing its coverage to include an additional 1.3 million more families.
- **Guatemala** initiated a conditional cash transfer program in 2008, *Mi Familia Progresá*, which will provide monthly health and nutrition transfers to families with children under age six, and additional transfer for education to families with at least one child between 6 and 15 attending primary school or preschool. Visits to health care centers and use of a basic package of nutritional and preventive maternal-child health care services, as well as regular school attendance are required under the program. The conditional cash transfer program is expected to cover 45 priority municipalities in 2008 and 125 of the country's 333 municipalities (i.e. 500,000 families) by the end of 2009.
- **Nepal** continued to build on its existing social protection initiatives by providing a monthly allowance to ethnic groups at risk, irrespective of age, persons of low caste, single women, and people of the mountainous Karnali Zone above the age of 60, as well as all other citizens above the age of 70. The government is also in the process of piloting a child grant program and continuing its work with donors and development agencies to build towards a more comprehensive social protection policy.
- **Pakistan** initiated a domestic policy discourse on the crisis culminating in a report titled "Economic Stabilization with a Human Face". In addition to economic reform recommendations the report pushed for a more robust social protection response to the crisis. The latter includes an Employment Guarantee Scheme in poor districts, increasing microfinance and housing access for the poor, and increasing coverage of the *Benazir Income Support Programme* which is slated to cover 1.8 million poor families in 2009, and later expanded to cover 5 million families in 2010.
- **Philippines** expanded its key social protection programs, such as the *Pantawid Pamilyang Pilipino Program (4Ps)*, which provides cash grants under particular conditions to poor households, with a goal to reach 700,000 households in 2009; the Self-Employment Assistance Kaunlaran, which provides capital assistance and a capacity building program for livelihood projects; and the Food for School program which provides rice allocations to elementary school children.
- **Senegal** boosted its social protection for mothers and young children by creating a cash transfer program to vulnerable mothers of children under five, accompanied by a strong communication campaign on maternal and child nutrition; designing a community-driven nutrition strategy involving growth monitoring for children under two, nutrition education for mothers, provision of iron and vitamin A supplements, de-worming and insecticide treated benefits; and providing support to sectoral and national nutrition policies, encompassing periodic distribution of micronutrient supplements, supervision of nutrition services.
- **Vietnam** nearly doubled its social safety net budget in 2009 compared to 2008. Its array of crisis responses include a one-off additional financial assistance to poor households, housing support for the poor, boosting existing social assistance programs, such as the program for poverty reduction in ethnic minority and mountainous areas, i.e. *Program 135*, and the health insurance program for the poor and near poor.

Source: Excerpted from Mendoza (2010:21-22).

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## Annex: Tables and Regression Results

**Annex Table 1. Descriptive Statistics of Main Variables**

Variable		Mean	Std. Dev.	Observations
Education Spending as % of GDP	overall	4.528332	2.31458	N = 3281
	between		2.292998	n = 191
	within		1.31346	T-bar = 17.178
Growth Rates of GDP per Capita	overall	1.762998	6.107265	N = 5016
	between		2.807636	n = 198
	within		5.710954	T-bar = 25.3333
Revenue as % of GDP	overall	24.94648	10.58906	N = 1470
	between		10.35771	n = 146
	within		3.346165	T-bar = 10.0685
Net Transfers from Abroad as % of GDP	overall	.0520937	.0923796	N = 3532
	between		.1136086	n = 168
	within		.0463107	T-bar = 21.0238
Portfolio Investment as % of GDP	overall	-.0000661	.1151851	N = 2715
	between		.1358427	n = 159
	within		.0716904	T-bar = 17.0755
Foreign Aid as % of GDP	overall	5.44e-08	2.17e-07	N = 3563
	between		1.62e-07	n = 181
	within		1.39e-07	T-bar = 19.6851

Source: World Development Indicators (World Bank 2008)

**Annex Table. 2 Descriptive Statistics of Governance Indicators**

Variable		Mean	Std. Dev.	Observations
Quality of Bureaucracy	overall	2.131345	1.192682	N = 3307
	between within		1.063759 .5179212	n = 141 T-bar = 23.4539
Government Stability	overall	7.562332	2.272082	N = 3306
	between within		1.095395 2.017218	n = 141 T-bar = 23.4468
Control of Corruption	overall	3.05346	1.374248	N = 3307
	between within		1.137338 .7565623	n = 141 T-bar = 23.4539
Religion in Politics	overall	4.570595	1.353182	N = 3307
	between within		1.150821 .6841729	n = 141 T-bar = 23.4539
Democratic Accountability	overall	3.677893	1.66092	N = 3332
	between within		1.400687 .8980652	n = 142 T-bar = 23.4648

Source: Inter-Country Risk Guide (Political Risk Group 2009)

### Annex Table 3. Country Classifications

#### Low-income economies (53)

Afghanistan	India	Rwanda
Bangladesh	Kenya	São Tomé and Príncipe
Benin	Korea, Dem Rep.	Senegal
Burkina Faso	Kyrgyz Republic	Sierra Leone
Burundi	Lao PDR	Solomon Islands
Cambodia	Liberia	Somalia
Central African Republic	Madagascar	Sudan
Chad	Malawi	Tajikistan
Comoros	Mali	Tanzania
Congo, Dem. Rep	Mauritania	Timor-Leste
Côte d'Ivoire	Mongolia	Togo
Eritrea	Mozambique	Uganda
Ethiopia	Myanmar	Uzbekistan
Gambia, The	Nepal	Vietnam
Ghana	Niger	Yemen, Rep.
Guinea	Nigeria	Zambia
Guinea-Bissau	Pakistan	Zimbabwe
Haiti		

#### Lower-middle-income economies (55)

Albania	El Salvador	Namibia
Algeria	Fiji	Nicaragua
Angola	Georgia	Paraguay
Armenia	Guatemala	Peru
Azerbaijan	Guyana	Philippines
Belarus	Honduras	Samoa
Bhutan	Indonesia	Sri Lanka
Bolivia	Iran, Islamic Rep.	Suriname
Bosnia and Herzegovina	Iraq	Swaziland
Cameroon	Jamaica	Syrian Arab Republic
Cape Verde	Jordan	Thailand
China	Kiribati	Tonga
Colombia	Lesotho	Tunisia
Congo, Rep.	Macedonia, FYR	Turkmenistan
Cuba	Maldives	Ukraine
Djibouti	Marshall Islands	Vanuatu
Dominican Republic	Micronesia, Fed. Sts.	West Bank and Gaza
Ecuador	Moldova	
Egypt, Arab Rep.	Morocco	

#### Upper-middle-income economies (41)

American Samoa	Kazakhstan	Poland
Argentina	Latvia	Romania
Belize	Lebanon	Russian Federation
Botswana	Libya	Serbia
Brazil	Lithuania	Seychelles

Bulgaria  
Chile  
Costa Rica  
Croatia  
Dominica  
Equatorial Guinea  
Gabon  
Grenada  
Hungary

Malaysia  
Mauritius  
Mayotte  
Mexico  
Montenegro  
Northern Mariana Islands  
Oman  
Palau  
Panama

Slovak Republic  
South Africa  
St. Kitts and Nevis  
St. Lucia  
St. Vincent and the Grenadines  
Turkey  
Uruguay  
Venezuela, RB

**High-income economies (60)**

Andorra  
Antigua and Barbuda  
Aruba  
Australia  
Austria  
Bahamas, The  
Bahrain  
Barbados  
Belgium  
Bermuda  
Brunei Darussalam  
Canada  
Cayman Islands  
Channel Islands  
Cyprus  
Czech Republic  
Denmark  
Estonia  
Faeroe Islands  
Finland

France  
French Polynesia  
Germany  
Greece  
Greenland  
Guam  
Hong Kong, China  
Iceland  
Ireland  
Isle of Man  
Israel  
Italy  
Japan  
Korea, Rep.  
Kuwait  
Liechtenstein  
Luxembourg  
Macao, China  
Malta  
Monaco

Netherlands  
Netherlands Antilles  
New Caledonia  
New Zealand  
Norway  
Portugal  
Puerto Rico  
Qatar  
San Marino  
Saudi Arabia  
Singapore  
Slovenia  
Spain  
Sweden  
Switzerland  
Trinidad and Tobago  
United Arab Emirates  
United Kingdom  
United States  
Virgin Islands (U.S.)

Table 1. Dependent Variable: Public Education Spending  
Full Sample

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	-1.12e-11 (-1.62)	-1.79e-11 (-1.63)	-2.04e-11* (-1.93)	-1.64e-11* (-1.69)	-3.59e-11* (-1.91)
Lag of Output gap*	2.18e-12 (1.20)	3.43e-12 (1.18)	4.16e-12 (1.42)	3.16e-12 (1.12)	8.89e-12* (1.98)
Lag of control of corruption	0.1833959*** (2.40)	0.0971196 (1.20)	0.1150787 (1.40)	0.1538662* (1.71)	-0.0759742 (-0.68)
Control of Corruption		-0.0019566 (-0.51)	-0.0011648 (-0.34)	-0.0038357 (-0.60)	0.0038798 (0.42)
Aid(% GDP)			0.9672625*** (2.22)	1.307978*** (3.38)	1.217632*** (3.51)
Portfolio investment(% GDP)				3.261926 (1.35)	5.369945* (1.91)
Net transfers(% GDP)					0.0091767 (0.28)
Revenue(% GDP)					
Constant	4.320212*** (15.26)	4.088431*** (11.49)	4.18518*** (12.08)	4.491185*** (12.78)	4.864409*** (4.78)
Observations	1649	1042	764	663	318
R-squared within	0.0843	0.0618	0.1645	0.1728	0.2259
Number of countries	99	82	66	60	50

Table 2. Dependent Variable: Public Education Spending  
Sub-Sample: Low Income Countries

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	9.95e-11 (1.68)	1.17e-10 (0.23)	-1.43e-10 (-0.26)	-2.38e-10 (-0.35)	-1.32e-09*** (-12.34)
Lag of Output gap*	-7.11e-11** (-2.13)	-8.80e-11 (-0.45)	3.70e-12 (0.01)	1.02e-10 (0.25)	7.29e-10*** (5.16)
Lag of control of corruption	0.1602331 (0.75)	0.2909664 (1.25)	0.2231029 (1.70)	0.1133184 (0.97)	-0.2296261 (-1.34)
Control of Corruption		-0.0025488 (-0.34)	0.0001645 (0.18)	-0.1561632 (-1.76)	-0.2243773 (-0.60)
Aid(%GDP)			-6.16647 (-1.80)	13.9081 (0.80)	13.45282 (0.38)
Portfolio investment(%GDP)					-0.756204 (-0.07)
Net transfers(%GDP)					0.0585903 (1.34)
Revenue(%GDP)					
Constant	3.210208*** (5.79)	3.298598*** (6.32)	2.599235*** (9.07)	3.294286*** (6.70)	3.715757*** (3.46)
Observations	289	178	84	72	40
R-squared within	0.1021	0.1341	0.2894	0.3807	0.8160
Number of countries	22	19	11	10	7

Table 3. Dependent Variable: Public Education Spending  
Sub-Sample: Lower Middle Income Countries

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	-3.42e-12 (-0.07)	-2.72e-11 (-0.31)	2.04e-11 (0.26)	2.71e-11 (0.36)	2.41e-14 (0.00)
Lag of Output gap*	-2.93e-12 (-0.22)	5.43e-12 (0.26)	-4.45e-12 (-0.23)	-7.67e-12 (-0.41)	-4.26e-12 (-0.41)
Lag of control of corruption	0.419337*** (2.90)	0.2677512 (1.70)	0.2256702 (1.49)	0.3441714* (1.94)	0.6048546** (2.22)
Control of Corruption		0.0068846 (0.87)	0.0089361 (0.82)	0.006746 (0.50)	0.0190866* (2.05)
Aid(%GDP)			2.234405 (1.07)	2.391729 (1.02)	1.851282 (0.26)
Portfolio investment(%GDP)				2.066542 (0.43)	9.442275 (0.91)
Net transfers(%GDP)					0.0107166 (0.09)
Revenue(%GDP)					
Constant	2.789057*** (6.22)	4.194732*** (8.24)	2.937038*** (4.61)	1.866417*** (3.17)	0.9375037 (0.66)
Observations	510	319	207	163	69
R-squared within	0.1724	0.1168	0.2764	0.2669	0.6890
Number of countries	30	25	20	18	14



Table 4. Dependent Variable: Public Education Spending  
Sub-Sample: Upper Middle Income Countries

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	1.95e-11 (0.67)	-5.97e-11 (-0.84)	-5.12e-11 (-0.79)	7.37e-12 (0.15)	-1.38e-10 (-1.32)
Lag of Output gap*	-1.01e-11 (-1.06)	1.10e-11 (0.50)	1.12e-11 (0.52)	-8.38e-12 (-0.52)	2.16e-11 (0.66)
Lag of control of corruption	0.0308535 (0.24)	0.0882656 (0.66)	0.0292866 (0.24)	0.0855055 (0.82)	-0.2120757 (-1.61)
Control of Corruption		-0.052328** (-2.22)	-0.0647123** (-2.52)	-0.0569097 (-1.41)	0.0553017 (1.18)
Aid(%GDP)			-0.0201746 (-0.08)	0.8854619 (1.15)	-1.022451* (-1.89)
Portfolio investment(%GDP)				6.022884 (0.99)	-7.554246 (-1.73)
Net transfers(%GDP)					-0.0063577 (-0.26)
Revenue(%GDP)					
Constant	4.540408*** (9.10)	4.679866*** (7.86)	4.669032*** (9.10)	3.789079*** (7.60)	4.705199*** (4.09)
Observations	307	222	190	176	89
R-squared within	0.1282	0.1726	0.3154	0.3284	0.5749
Number of countries	17	15	15	15	12

Table 5: Dependent Variable: Public Education Spending  
Sub-Sample: High Income Countries

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	-7.36e-12 (-0.86)	-1.39e-11 (-1.40)	-1.44e-11 (-1.38)	-1.04e-11 (-1.00)	-2.88e-11 (-1.04)
Lag of Output gap*	1.50e-12 (0.65)	2.81e-12 (0.92)	2.95e-12 (0.92)	1.95e-12 (0.60)	7.20e-12 (1.03)
Lag of control of corruption	0.0487333 (0.62)	-0.0176298 (-0.28)	0.0884707 (0.90)	0.0275382 (0.31)	0.0813243 (0.38)
Control of Corruption		-0.008742 (-1.48)	-0.0056702 (-0.91)	-0.0107693 (-1.93)	-0.0148056 (-1.47)
Aid(%GDP)			2.156939*** (5.23)	2.083264*** (4.51)	1.144538*** (3.53)
Portfolio investment(%GDP)				-21.2235*** (-3.63)	-19.067 (-0.53)
Net transfers(%GDP)					0.0187284 (0.40)
Revenue(%GDP)					
Constant	4.425882*** (11.37)	6.252873*** (20.19)	4.560294*** (9.64)	5.503068*** (8.95)	4.923864*** (3.29)
Observations	543	323	283	252	120
R-squared within	0.1177	0.2218	0.2596	0.2850	0.4052
Number of countries	30	23	20	17	17

Table 6. Dependent Variable: Public Healthcare Spending  
Full Sample

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	-4.48e-12 (-0.80)	1.12e-12 (0.13)	-1.56e-12 (-0.20)	-3.63e-12 (-0.48)	-1.61e-11*** (-3.20)
Lag of Output gap*	5.87e-13 (0.51)	-1.10e-12 (-0.49)	-3.83e-13 (-0.17)	9.56e-14 (0.04)	3.94e-12*** (2.94)
Lag of control of corruption	0.0671554 (1.44)	0.0579458 (1.12)	0.055486 (0.83)	0.0396054 (0.58)	0.0270783 (0.30)
Control of Corruption		0.0051564 (1.31)	0.0056369 (1.42)	0.0138616*** (3.59)	0.006967* (1.75)
Aid(%GDP)			0.2149199 (0.59)	0.626928 (1.45)	-0.0794434 (-0.12)
Portfolio investment(%GDP)				-1.754337 (-0.48)	0.2780908 (0.06)
Net transfers(%GDP)					0.0152038 (0.60)
Revenue(%GDP)					
Constant	2.78112*** (10.61)	2.9905*** (8.28)	2.955437*** (7.40)	3.209961*** (10.23)	3.738927*** (5.83)
Observations	1842	1144	829	734	365
R-squared within	0.1860	0.1589	0.2487	0.2528	0.1848
Number of countries	102	82	67	63	51

Table 7. Dependent Variable: Public Healthcare Spending  
Sub-Sample: Low Income Countries

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	-3.89e-11 (-1.06)	-3.89e-11 (-1.06)	3.32e-10 (1.71)	1.04e-10 (0.60)	-1.79e-10 (-0.95)
Lag of Output gap*	9.95e-12 (0.72)	9.95e-12 (0.72)	-2.09e-10* (-2.05)	-7.25e-11 (-0.71)	1.00e-10 (1.05)
Lag of control of corruption	0.0469067 (0.45)	0.0469067 (0.45)	0.2718076*** (3.88)	0.2657244** (2.67)	0.0757737 (0.60)
Control of Corruption			-0.0043816*** (-4.38)	-0.0211793 (-1.18)	-0.3877129 (-1.73)
Aid(%GDP)			-5.388483 (-0.99)	-8.14177 (-1.02)	4.336766 (0.34)
Portfolio investment(% GDP)				-6.044544 (-1.95)	-1.78972 (-0.45)
Net transfers(%GDP)					0.0411518 (1.67)
Revenue(%GDP)					
Constant	0.4568193 (5.49)	0.4568193*** (5.49)	1.013593*** (5.43)	1.492145*** (5.81)	0.9185 (1.67)
Observations	401	401	102	94	45
R-squared within	0.1263	0.1263	0.2186	0.2941	0.5995
Number of countries	25	25	13	13	8

Table 8. Dependent Variable: Public Healthcare Spending  
Sub-Sample: Lower Middle Income Countries

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	-1.08e-11** (-2.26)	-1.13e-11 (-1.44)	-1.73e-11 (-1.45)	-1.68e-11 (-1.64)	-2.28e-11*** (-3.89)
Lag of Output gap*	4.66e-12 (1.52)	3.64e-12 (1.03)	6.63e-12 (1.15)	7.56e-12 (1.53)	5.72e-12*** (3.60)
Lag of control of corruption	0.1694836* (1.94)	0.1417589 (1.57)	0.1321878 (1.22)	-0.0728193 (-0.58)	0.1302178** (2.75)
Control of Corruption		-0.0023836 (-0.24)	0.0018355 (0.37)	-0.0004215 (-0.04)	-0.0012237 (-0.36)
Aid(%GDP)			1.696617* (1.90)	1.544205 (1.63)	-0.3775778 (-0.23)
Portfolio investment(%GDP)				3.609173 (1.44)	5.581463 (1.58)
Net transfers(%GDP)					0.0902748** (2.45)
Revenue(%GDP)					
Constant	1.449215* (1.98)	2.403973* (1.75)	-0.6985179 (-1.69)	0.9612969** (2.18)	0.5398988 (0.91)
Observations		321	206	166	83
R-squared within		0.1279	0.3806	0.3552	0.6927
Number of countries		24	19	18	13

Table 9. Dependent Variable: Public Healthcare Spending  
Sub-Sample: Upper Middle Income Countries

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	-9.13e-12 (-0.40)	3.94e-11 (0.91)	3.56e-11 (0.80)	5.01e-11 (1.51)	-5.87e-10** (-2.39)
Lag of Output gap*	2.27e-12 (0.34)	-1.16e-11 (-1.01)	-1.01e-11 (-0.81)	-1.40e-11 (-1.61)	1.66e-10** (2.34)
Lag of control of corruption	0.0482357 (0.54)	0.0739199 (0.48)	0.0779559 (0.46)	0.0535687 (0.31)	-0.328824* (-1.91)
Control of Corruption		-0.0056701 (-0.41)	0.0046022 (0.24)	0.0295785 (1.06)	-0.0075051 (-0.56)
Aid(%GDP)			1.168779 (1.32)	1.547363** (2.42)	2.269843*** (4.09)
Portfolio investment(%GDP)				19.28777 (1.19)	-3.940984 (-0.55)
Net transfers(%GDP)					0.002741 (0.08)
Revenue(%GDP)					
Constant	3.00533*** (6.01)	2.976899*** (4.70)	2.59154*** (4.27)	0.4395163 (0.61)	5.154663*** (5.09)
Observations	319	229	212	196	96
R-squared within	0.2234	0.2761	0.3279	0.3190	0.3499
Number of countries	17	15	15	15	13

Table 10. Dependent Variable: Public Healthcare Spending  
Sub-Sample: High Income Countries

VARIABLES	(1)	(2)	(3)	(4)	(5)
Lag of Output gap	4.31e-12 (0.83)	3.84e-12 (0.35)	3.52e-12 (0.31)	8.68e-12 (0.84)	-1.61e-11 (-1.63)
Lag of Output gap*	-1.41e-12 (-1.61)	-1.70e-12 (-0.55)	-1.59e-12 (-0.50)	-2.80e-12 (-0.90)	3.98e-12 (1.64)
Lag of control of corruption	-0.0738843 (-1.17)	-0.0527806 (-0.75)	0.0270349 (0.20)	-0.0121739 (-0.11)	0.1982589 (1.54)
Control of Corruption	5.468399*** (15.05)	0.0173275*** (6.61)	0.0196651*** (6.02)	0.0163734*** (4.31)	0.0069562* (1.79)
Aid(%GDP)			0.0032152 (0.01)	-0.0764913 (-0.14)	-1.193469 (-1.25)
Portfolio investment(%GDP)				-34.81781*** (-4.31)	-1.988837 (-0.06)
Net transfers(%GDP)					0.0612919* (1.79)
Revenue(%GDP)					
Constant	5.468399*** (15.05)	6.671726*** (22.35)	5.212536*** (6.44)	6.627755*** (12.64)	3.49474*** (3.00)
Observations	593	351	309	278	141
R-squared within	0.3593	0.4349	0.4366	0.5605	0.6404
Number of countries	30	23	20	17	17

<b>Table 11a. Dependent Variable: Public Education Spending</b>							
<b>Variable of Interest: Real GDP Per Capita Growth</b>							
			<b>All Countries</b>	<b>Low Income</b>	<b>Lower Middle Income</b>	<b>Upper Middle Income</b>	<b>High Income</b>
FE	Model with bureaucracy quality	growth rate	<b>0.094</b> <i>(0.004)**</i>	0.102 <i>(0.369)</i>	<b>0.144</b> <i>(0.032)**</i>	-0.038 <i>(0.335)</i>	<b>0.363</b> <i>(0.027)**</i>
		interaction term of growth and bureaucracy quality	<b>-0.056</b> <i>(0.000)**</i>	<b>-0.078</b> <i>(0.058)*</i>	-0.043 <i>(0.153)</i>	-0.005 <i>(0.770)</i>	<b>-0.099</b> <i>(0.034)**</i>
	Model with control of corruption	growth rate	<b>0.067</b> <i>(0.098)*</i>	-0.1 <i>(0.609)</i>	<b>0.141</b> <i>(0.056)*</i>	-0.02 <i>(0.640)</i>	0.019 <i>(0.813)</i>
		interaction term of growth and control of corruption	<b>-0.028</b> <i>(0.027)**</i>	0.02 <i>(0.791)</i>	-0.021 <i>(0.277)</i>	-0.008 <i>(0.572)</i>	-0.001 <i>(0.955)</i>
	Model with government stability	growth rate	-0.023 <i>(0.558)</i>	<b>-0.191</b> <i>(0.079)*</i>	0.047 <i>(0.437)</i>	-0.027 <i>(0.554)</i>	-0.039 <i>(0.795)</i>
		interaction term of growth and government stability	0.001 <i>(0.796)</i>	0.006 <i>(0.683)</i>	0.006 <i>(0.592)</i>	-0.001 <i>(0.860)</i>	0.006 <i>(0.717)</i>

<b>Table 11b. Dependent Variable: Public Health Spending</b>							
<b>Variable of Interest: Real GDP Per Capita Growth</b>							
			<b>All Countries</b>	<b>Low Income</b>	<b>Lower Middle Income</b>	<b>Upper Middle Income</b>	<b>High Income</b>
FE	Model with bureaucracy quality	growth rate	<b>0.04</b> <i>(0.071)*</i>	0.001 <i>(0.973)</i>	0.002 <i>(0.944)</i>	-0.021 <i>(0.522)</i>	-0.106 <i>(0.184)</i>
		interaction term of growth and bureaucracy quality	<b>-0.033</b> <i>(0.000)**</i>	0.001 <i>(0.959)</i>	0.009 <i>(0.645)</i>	0.014 <i>(0.477)</i>	0.000 <i>(0.999)</i>
	Model with control of corruption	growth rate	0.008 <i>(0.788)</i>	0.033 <i>(0.332)</i>	-0.023 <i>(0.392)</i>	0.039 <i>(0.479)</i>	<b>-0.192</b> <i>(0.002)**</i>
		interaction term of growth and control of corruption	-0.011 <i>(0.216)</i>	-0.005 <i>(0.624)</i>	<b>0.013</b> <i>(0.067)*</i>	-0.013 <i>(0.431)</i>	0.019 <i>(0.185)</i>
	Model with government stability	growth rate	-0.032 <i>(0.305)</i>	<b>-0.067</b> <i>(0.099)*</i>	0.008 <i>(0.875)</i>	-0.016 <i>(0.796)</i>	<b>-0.4</b> <i>(0.011)*</i>
		interaction term of growth and government stability	0.001 <i>(0.760)</i>	0.007 <i>(0.178)</i>	0.001 <i>(0.835)</i>	0.003 <i>(0.680)</i>	<b>0.033</b> <i>(0.047)**</i>

Notes: The first entry in each cell is the coefficient estimate for the real GDP per capita growth rate, and the second entry is the coefficient of the real GDP per capita growth interacted with a quality of governance indicator. Figures in parentheses are p-values. The coefficients and the p-values are robust to heteroscedasticity. \*\* and \* represent marginal significance levels with less than 5% , and with equal or less than 10%, respectively. The coefficients in bold black indicate countercyclical public expenditures; the coefficients in bold red indicate procyclical public expenditures.