



IMF Working Paper

Evolution of Debt Sustainability Analysis in Low-Income Countries: Some Aggregate Evidence

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Finance Department

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Abstract

The Debt Sustainability Analysis (DSA) for low-income countries (LICs) is a standardized analytical tool to monitor debt sustainability. This paper uses DSAs from three periods around the time of the global economic crisis to analyze the projected trajectories of debt ratios for a sample of LICs. The aggregate data suggest that LIC vulnerabilities improved on the whole during the period prior to the crisis, and that the crisis had a strong short-run impact on key ratios of debt (debt-to-GDP, -exports, and -fiscal revenues) and debt service (debt service-to-exports, and -revenues). Although projected debt burdens increased following the crisis, debt indicators tend to return to their pre-crisis levels over the projection horizon. This may reflect a strong and durable policy response by LICs towards the crisis, or also reflect specific assumptions on the long-run growth dividends of public external debt.

EL Classification Numbers: E6, E63, H63, H68

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I. INTRODUCTION

The Debt Sustainability Framework (DSF) for low-income countries (LICs) was developed jointly by the International Monetary Fund (IMF) and the World Bank as a standardized analytical tool to monitor debt sustainability in this group of countries. Among its objectives are to help guide LICs' borrowing decisions, and to detect potential crises early and thereby suggest appropriate preventive action by country authorities. The DSF is a key input to IMF surveillance and to Fund and World Bank policy advice and program design. Importantly, the DSF has been formally integrated into creditors' lending and grant allocation decisions, consistent with meeting LICs' long-term development goals and debt-sustainability.

A key element of the DSF, introduced in 2005, is the Debt Sustainability Analysis (DSA), which does not assess debt sustainability per se, but rather countries' risk of debt distress.² To date, well over 300 LIC DSAs have been conducted for 73 countries. LIC DSAs are required by the Executive Boards of the IMF and World Bank to be conducted annually for PRGT-eligible countries, and the results are typically included with Board reviews of IMF programs or in the context of Article IV surveillance discussions. A majority have been published.

Partly in response to some criticisms of the methodological framework as well as the underlying assumptions, the framework has undergone various modifications since its implementation, aimed at improving its comprehensiveness and accuracy in monitoring debt sustainability.³ Since 2007, each LIC DSA has included two components: an external DSA, in which the debt dynamics are driven by the non-interest current account balance, net foreign direct investment and endogenous debt dynamics (including contributions from interest rates, GDP growth, and inflation and exchange rate changes), and a public DSA, driven by the primary fiscal balance.

This paper provides an analysis of DSAs and suggests that looking more systematically at past DSAs could help contribute to the monitoring of debt vulnerabilities in LICs. Specifically, the paper uses existing DSAs from three periods around the time of the global economic crisis to analyze the projected trajectories of debt ratios for a sample of LICs. The aggregated data suggest that LIC debt sustainability projections improved on the whole during the period prior to the crisis, and that the crisis had a strong short-run impact on key debt and debt service ratios. However, following the crisis, the long-term projections of these

² World Bank (2006) defines external public debt as being sustainable "when it can be serviced without resort to exceptional financing (such as debt relief) or a major future correction in the balance of income and expenditures". The DSF includes country ratings in terms of debt sustainability. In this paper, we consider external debt to be sustainable when debt ratios are below their respective benchmark thresholds in the baseline scenario and thus when countries risk of debt distress is considered low or moderate (See Box 1).

³ See IMF (2012) and IMF (2009b).

key ratios tend to converge on average to their pre-crisis levels. In disentangling the assumptions behind debt ratio projections, both in terms of LIC indebtedness and macroeconomic performance, the paper highlights some trends in DSA underlying assumptions. Notably, it shows that projections of decreasing debt ratios over time rely on assumptions about the policy response by LICs throughout the projection period and the implied growth dividend of debt-financed public investment over the long run.

Section II discusses the motivation for the paper and sample data. Section III makes observations on the key baseline ratios in the DSA over three time periods, including the evolution of debt and debt service (numerators) and scaling variables (output, exports and revenues—denominators). It also discusses heterogeneity across the sample countries. Section IV offers a few conclusions.

II. MOTIVATION AND SAMPLE

In the 1970s and 1980s LICs experienced strong increases in (mostly external) debt to the point that debt positions became unsustainable. This prompted the launch of key multilateral debt relief initiatives—the Highly Indebted Poor Countries Initiative (HIPC)⁴ launched in 1996 and the Multilateral Debt Relief Initiative (MDRI)⁵ in 2005—supported also by bilateral debt relief efforts. At the same time, policy frameworks have since improved in many LICs, supported in part through formal economic programs. By the 2000s, many LICs achieved much stronger and sustained growth and overall economic performance. In particular, they responded relatively well to the series of shocks they faced at the end of the decade (commodity price shocks and the global economic crisis). Indeed, in analyzing the short-term impacts of the global crisis on non fuel-exporting LICs from 2007 through 2009, Berg et al (2011) find that LICs tended to perform better than advanced countries, and that declines in growth were mostly accounted for by the external shock.

Nevertheless, because of remaining weaknesses in policy frameworks and narrow export bases, LICs remain vulnerable to external shocks (Sun (2004) and Yang and Nyberg (2009)). Despite the relative resilience of LICs to the global crisis, debt ratios have deteriorated due to

⁴ The HIPC Initiative was launched in 1996 by the IMF and the World Bank, with the aim of ensuring that no poor country faces a debt burden it cannot manage. It has led to debt relief in 36 out of 39 countries eligible for HIPC Initiative assistance. HIPC debt relief is granted following a two-step process. Countries must meet certain criteria in terms of macroeconomic track-record and commitment to poverty reduction. The Fund and Bank provide interim debt relief in the initial stage (the “decision point”) and, when a country meets its commitments, the full amount of debt relief on eligible debt is provided (the “completion point”).

⁵ The MDRI complemented the HIPC initiative from 2005 by providing full debt relief on eligible debt from the IMF, the International Development Association (World Bank) and the African Development Fund (African Development Bank). To qualify for debt relief, eligible countries must be current on their obligations to the IMF and demonstrate satisfactory performance in macroeconomic policies, public expenditure management and poverty reduction strategy implementation. Reaching the HIPC completion point is a requirement for debt relief under the MDRI.

higher financing requirements and a weaker growth outlook. Risks of reversals in foreign flows, including FDI and remittances, remain a source of vulnerability. While most LIC debt financing has been highly concessional, many LICs are now at a stage of development where they are beginning to take on higher cost, non-concessional debt. Reforms to the IMF's debt limits policy in 2009 moved away from a single design for concessional requirements to a menu of options based on assessment of LICs' debt vulnerabilities and capacities.⁶

Development of, and access to, domestic debt markets is also playing an increasing role in some LICs, which may reduce exposure to foreign interest rates and currency risk, though often at the cost of much higher domestic interest rates (Arnone and Presbitero (2006)). Future aid flows are also a concern. IMF (2009a) highlights that LICs have received lower than committed aid flows since the crisis, due to fiscal problems in traditional donor countries, though this could be compensated for by the emergence of new official lending from emerging countries, including China, India, and oil exporting nations of the Gulf. Finally, IMF (2010) underscores that continued LIC debt sustainability depends critically on key assumptions for the post-crisis period: that the shock to external demand is temporary and has no long-term growth impact, and that LICs will unwind counter-cyclical policies and continue to have access to adequate financing.

In this context, the DSF is an important tool to monitor debt vulnerabilities in LICs. The framework provides key input to IMF surveillance and its outcome influences multilateral financing decisions to LICs. Nevertheless, given the DSF's relatively short history, there is little empirical work that systematically examines the evolution of DSA projections since its implementation. This study uses data from earlier external DSAs to analyze the evolution of LICs' external debt, which still constitutes the bulk of their public debt.

Box 1. The External Debt Sustainability Analysis (DSA)

The external DSA consists of:

- a forward-looking analysis of a country's projected external debt and debt service dynamics over the next 20 years (baseline scenario) and its vulnerability to external and policy shocks (alternative scenarios and bound-tests);
- an assessment of the risk of debt distress, based on indicative debt burden thresholds that depend on the quality of the country's policies and institutions; and
- recommendations on a borrowing (and lending) strategy that limits the risk of debt distress.

The external DSA is based on five key debt burden ratios:

- debt-to-GDP
- debt to-exports
- debt-to-revenues

⁶ See IMF (2009d).

- debt service-to-exports
- debt service-to-revenues

Each of the debt burden indicators is expressed in present value terms to better reflect the high share of concessional financing in LICs debt. “External public debt” refers to external (residency criterion) public and publicly guaranteed debt.

The LIC DSF includes policy dependent thresholds for the key external debt indicators. The thresholds used as a benchmark for baseline debt ratios depend on the country’s CPIA score†, reflecting the hypothesis that in countries with good policies and institutional capacity debt accumulation is less risky. CPIA scores are averages of 16 indicators of policy and institutional quality. On the basis of the CPIA scores, countries are divided into three performance categories—weak/medium/strong performers. A three-year moving average CPIA score is used to reduce volatility (and potential fluctuations in the loan/grant mix under the framework).

Debt Burden Thresholds under the DSF

	NPV of debt in percent of			Debt service in percent of	
	Exports	GDP	Revenue	Exports	Revenue*
Weak Policy	100	30	200	15	25
Medium Policy	150	40	250	20	30
Strong Policy	200	50	300	25	35

In addition to the baseline scenarios, two alternative scenarios and six bound tests are run:

- An *historical average scenario* in which key variables (real GDP growth, GDP deflator, non-interest current account deficit, net FDI and other non-debt creating flows) are set at their respective 10-year average throughout the projection period
- An *alternative financing conditions scenario* in which the interest rate on new borrowing is set 200 basis points higher than in the baseline scenario
- Four *bound tests* in which real GDP growth, export growth, inflation (as measured by the variation in the US dollar GDP deflator) or net non-debt flows are set one standard deviation below their historical average in the second and third year of the projection period
- A *combined bound-test* that is a combined shock to the four variables above
- An *exchange rate shock scenario* of a one-time 30 percent depreciation of the domestic currency in the first year of the projection period

On the basis of the DSA output, an overall rating is assigned based on the risk of external debt distress:

- **low risk:** all debt burden indicators are well below the thresholds in baseline scenarios and do not breach them under any stress tests
- **moderate risk:** debt burden indicators are below the thresholds in the baseline scenario, but stress tests indicate that thresholds could be breached if there are external shocks or abrupt changes in macroeconomic policies
- **high risk:** baseline scenario and stress tests indicate a protracted breach of debt or debt-service thresholds, but the country does not currently face any repayment difficulties
- **in debt distress:** the country is already having repayment difficulties.

† World Bank's Country Policy and Institutional Assessment index, compiled annually.

* Debt-service-to-revenue thresholds were revised lower in February 2010 to 18, 20, and 22 percent for weak, medium, and strong policy performers, respectively.

The DSF has also been used as a tool to study cross-country debt vulnerabilities. Hernandez and Gamarra (2010) analyze the potential deterioration in LICs' external debt burdens resulting from a simulated fall in exports using the DSF. They find that the tightening of financial conditions poses a serious threat to liquidity and solvency indicators and that access to concessional financing is critical to avoid debt distress episodes. IMF (2010) analyzes the extent to which debt vulnerabilities in LICs have risen as a result of the global crisis. It compares pre- and post-crisis DSAs outcomes for a sample of 36 LICs and finds that the ongoing international crisis had a significant, but not unsustainable, impact on LICs' debt vulnerabilities. It concludes that ensuring debt sustainability for LICs requires lenders to maintain concessional financing while LICs need to improve institutions and policies, including those aimed at fiscal consolidation.

The DSF has not been immune to criticism. Some have accused its use as ultimately constraining LICs' financing of their development goals, notably due to weaknesses in the analysis of the growth-investment nexus. The stress tests implemented in the framework have been criticized as partial equilibrium exercises that fail to take into account multiple shocks as well as shocks of the magnitude of those LICs faced during the recent food, fuel and financial crises. Some have also questioned underlying DSA assumptions, including that historically IMF macroeconomic projections have tended to be over-optimistic (Leo (2009), Wyplosz (2007)). Nwachukwu (2008) also questions the hypothesis that crucial structural reforms both at the economic and political level will be effectively implemented. In the recent period, the scenario of rapid recovery for LICs after the international crisis shock has been questioned by Presbitero (2009). Partly in response to such critiques, the framework has undergone various modifications since its implementation in 2005, aimed at improving its comprehensiveness and accuracy in monitoring debt vulnerabilities, most recently in IMF (2012).⁷

This paper analyzes the evolution of LIC external public debt projections in DSAs. It builds on earlier empirical work based on completed DSAs (notably IMF (2010)). Its innovation is that it considers an extended sample of LICs and analyzes DSAs outcomes for several "vintage" years since the implementation of the DSF to the global crisis period. The sample includes 29 LICs for which DSAs were available around 2006, 2008 and 2010 (Table 1)⁸ after excluding countries that reached their HIPC Completion Point between 2006 and 2010,

⁷ See IMF/World Bank (2004a), (2005), and (2012). The last paper proposed, among other things, revisions to some policy-dependent thresholds, strengthening the analysis of total public debt and fiscal vulnerabilities, greater use of models developed by IMF and World Bank staffs to better capture investment-growth linkages, and simplifying the template. See also IMF (2009b).

⁸ The choice of two-year, rather than annual, intervals reflects i) a need for a sufficiently large dataset, as in some cases DSAs were not issued during one of the three chosen years, in which case a one-year earlier or later DSA was included (see Table 1, first footnote); and ii) the need to work with a tractable dataset (individual DSA files are large).

owing to the effect of debt relief on debt ratios.⁹ The sample includes 12 HIPC countries, 9 of which had reached the Completion Point before April 2006, while the other 3 are Decision or Pre-Decision Point countries. The remaining 17 countries are non-HIPC LICs.

Table 1. Sample Countries†

Angola*	Georgia	Myanmar*
Bangladesh	Ghana	Nepal
Bolivia	Guyana*	Papua New Guinea*
Burkina Faso	Honduras	Solomon Islands
Cambodia	Kyrgyz Republic	Tajikistan
Cameroon*	Lao People's Democratic Republic	Tanzania
Chad	Lesotho	Tonga
Comoros	Mauritania	Vietnam
Djibouti*	Moldova	Yemen*
Dominica	Mozambique	

† The sample includes DSAs issued in 2006, 2008, and 2010, where available. For Burkina Faso, Dominica, Ghana, Myanmar, Papua New Guinea, Tajikistan, and Tonga, 2007 DSAs are used for 2006 and, for Djibouti and Vietnam, 2005 DSAs are used; for Cameroon, the 2008 DSA is substituted by its 2009 DSA; and, for Angola, Bangladesh, Bolivia, Mauritania, and Myanmar, the 2009 DSAs are used for 2010.

* The data of the following DSAs are not published and, therefore, the series are not shown in the Appendix tables: for Angola and Guyana, 2006 and 2008; for Djibouti, 2006 and 2010; for Myanmar, none of the DSAs are published; for Yemen, 2006; and, for Cameroon and Papua New Guinea, 2010. Data for these countries are included in all aggregate charts and summary statistics, but specific references to these countries are excluded in the text.

We present aggregated data based on simple averages of key debt ratios in the DSAs over the three DSA vintages, and make stylized observations on the evolution of debt dynamics in LICs in response to the crisis (2008 versus 2006) and post-crisis (2010 versus 2008) periods. As in IMF (2010), the cutoff for the post-crisis period is set at May 1, 2009. The paper does not attempt to control for specific underlying economic, structural and policy changes in individual sample countries that could drive the common trends shown in the aggregate results. Moreover, in discussing only simple averages, the paper obscures fundamental differences in policy responses and borrowing outcomes for different categories of LICs—for

⁹ Countries that did not reach HIPC completion point between 2006 and 2010 may have still benefited from debt reduction during this period however, through for example a Naples flow treatment, or through interim relief following HIPC decision point.

example between commodity exporters and net importers. A later section highlights the diversity in responses and outcomes across the sample.

III. RESULTS

A. Baseline ratios

Figure 1 presents the five main aggregated ratios in the baseline scenario of the external DSA for the sample of countries:¹⁰

- debt-to-GDP;
- debt-to-exports;
- debt-to-government revenues;
- debt service-to-exports; and
- debt service-to-government revenues.

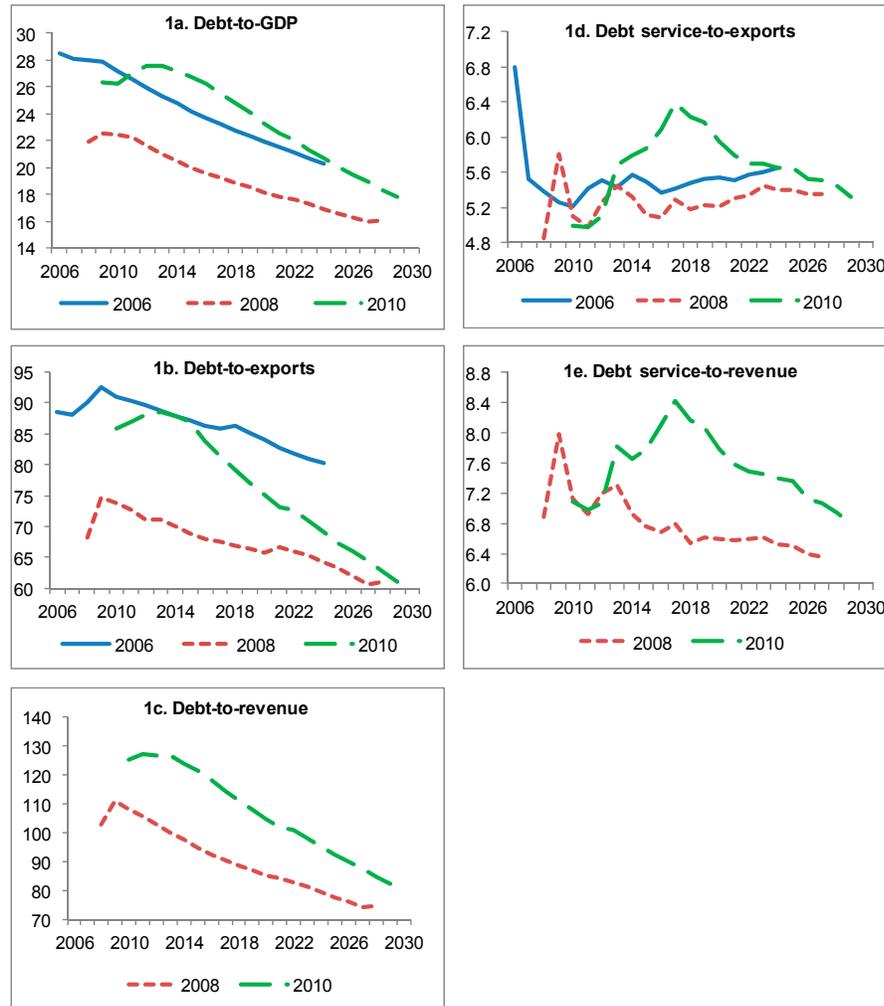
The figure shows that the projections have been substantially revised from one period to another and seem to have varied according to the contemporaneous global outlook: the average debt paths improved significantly in 2008¹¹ relative to 2006, then deteriorated sharply in 2010. The current macroeconomic prospects affected the projections over the entire forecast period,¹² although the impact and adjustments are sharper in the short- to medium-term. In contrast, projections have tended to converge in the long run over the three DSA vintages.

¹⁰ Unless specified otherwise, all aggregated series in this study are calculated as the *simple mean* of the total sample. Debt refers to public and publicly guaranteed external debt in present value terms.

¹¹ Due to lags in data capture, DSA preparation and issuance, the effects of the global crisis and the food/fuel shocks would not be captured until later DSAs.

¹² DSA projections span 20 years; thus the 2006 DSA projections extend from 2006–2026, 2008 projections from 2008–2028, and 2010 vintage DSAs from 2010–2030.

**Figure 1. Evolution of Baseline Debt Ratios, 2006–29
(In percent)**



Sources: Country authorities; and staff estimates and projections.

Three main conclusions can be drawn from these charts:

- First, between 2006 and 2008, the debt outlook, as reflected in the average paths of the key DSA baseline debt ratios, improved substantially.¹³ Ratios of debt-to-GDP, debt-to-exports, and (to a lesser extent) debt service-to-exports, which had been projected to decline through time in 2006, improved significantly in 2008 over the whole projection period, while broadly maintaining their long-term downward trend. For each indicator, the 2008 paths lie below those for 2006, with the single exception

¹³ Ratios of debt and debt-service-to government revenues are not included in the figures for 2006, as the denominator (government revenues) was not systematically included as a specific output in LIC DSAs at that time.

of the slight increase in debt service-to-exports for 2009 (Panel 1d). Despite the beginning of the food and fuel crisis around mid-2007, LIC prospects seem to have reflected improved macroeconomic and financial fundamentals during the first decade of the new millennium, which perhaps had not been fully reflected in 2006 DSAs. Many LICs faced improved terms-of-trade and buoyant external demand, propelled by strong and sustained growth in advanced and emerging market countries. Those LICs in the sample that had benefited from HIPC and MDRI debt relief prior to 2006 were better positioned to undertake growth-enhancing public investment. Partly as a result, external sources of financing were favorable and FDI and remittances flows increasing. Signs of improved governance and efforts to improve debt management capabilities also played a part. The marked improvement in debt ratio forecasts in 2008 over 2006 thus reflected improvements in projection scaling variables (denominators in the debt ratios) even as debt and debt service burdens (numerators) were increasing.

- Second, debt ratios—both current and projected—deteriorated sharply from 2008 and 2010, as the full damage of the food and fuel crisis on LIC fiscal buffers, as well as the effects of the global financial and economic crisis, began to be reflected in LIC DSAs. The rise in food and fuel prices, decreases in projected non-debt resources (FDI, remittances), and other factors led to an increase in financing needs while scaling variables (GDP, exports and fiscal revenues) were revised downward contributing to adverse debt dynamics (interest rate-growth differentials, exchange rate movements). Nonetheless, despite the magnitude of the shocks, their impact on the debt dynamics was highly concentrated on short- to medium-term projections. The long-term trajectories in 2010 DSAs remained on generally decreasing paths. Interestingly, the aggregate projections tend to converge, and in some cases even surpass, those in the earlier (2006 and 2008) vintage DSAs (Panels 1a to 1e).
- Third, despite the recent deterioration, average DSA debt ratios remained comfortably below their respective thresholds along the projection horizon (Table 2). Thus, even in the face of the noticeable deterioration in key debt ratios in 2010 DSAs, baseline projections for most LICs did not point to a major increase in vulnerabilities.¹⁴

Moreover, the sharp deterioration is concentrated in the short-term for debt-stock ratios and in the medium-term for debt service ratios: revisions to long-term projections are more limited. For example, average debt-to-GDP ratio projections for the year 2012 fell from 26.0 percent in 2006 DSAs to 21.6 percent in 2008 DSAs, but adjusted significantly higher to 27.5 percent in 2010 DSAs, a trough-to-peak change of 6.0 percentage points. While the projections for the same indicator for the year 2024 followed a similar pattern (down-up), the trough-to-peak variation was much lower, at 3.8 percentage points (20.3 percent in 2006, falling to 16.9 percent in 2008, rebounding to 20.7 percent in 2010). Overall, despite

¹⁴ Between 2008 and 2010, only two countries in the dataset experienced downgrades in staff's assessment of their risk of debt distress.

revisions in the level of debt ratios, average prospects for *long-run* LIC debt vulnerabilities based on DSAs do not appear to have changed significantly over the sample period.

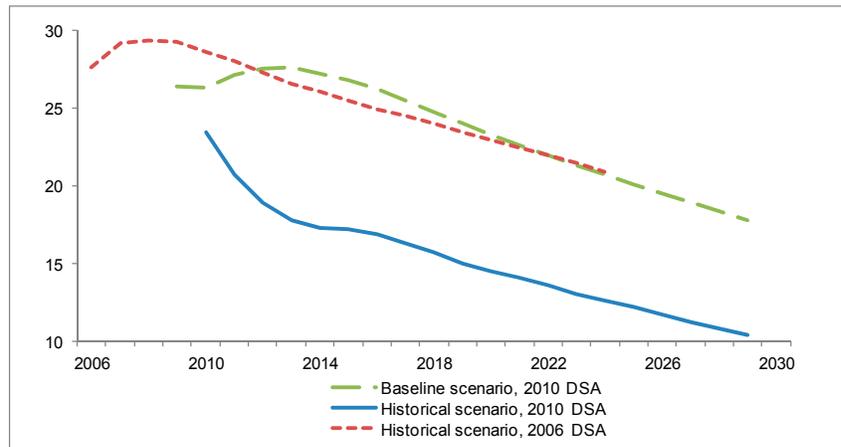
**Table 2. Baseline Peak Average Values by DSA Vintage
(in percent)**

Baseline Ratio	2006 DSA		2008 DSA		2010 DSA		Most conservative threshold (in percent)
	peak average value	year	peak average value	year	peak average value	year	
Debt/GDP	28.5	2006	22.6	2009	27.6	2013	30
Debt/Exports	92.4	2009	74.6	2009	88.6	2013	100
Debt/Revenues			110.8	2009	127.3	2011	200
Debt service/Exports	6.8	2006	5.8	2009	6.4	2017	15
Debt service/Revenues			8.0	2009	8.4	2017	25

DSAs systematically present stress tests, consisting of alternative scenarios and bound tests, against which the baseline projections can be compared. Baseline and stress test outcomes determine the risk rating. In addition, historical scenarios are a standard feature built into the DSA template to compare baseline projections with the evolution of debt ratios under historical trends for key economic variables. They provide a benchmark to analyze present and projected outcomes, and can help gauge excessive optimism in underlying projections.

The average historically based debt-to-GDP projection improved noticeably in 2010 compared with 2006 vintage DSAs (Figure 2). This plausibly reflects improved macroeconomic performance in LICs over the historical windows (1999–2009 in 2010 DSAs, against 1995–2005 in 2006 DSAs), including stronger debt management capabilities, and for some, the effect of debt relief prior to 2006. Nevertheless, the 2010 baseline scenario path lies well above the 2010 historical path, which may reflect the anticipated crisis-related damage to LICs' debt burdens, or alternatively, possible improvements in the fundamentals of these economies that could permit higher sustainable debt ratios.

Figure 2. Debt-to-GDP: 2010 Baseline Scenario vs. 2006 and 2010 Historical Scenarios, 2006–29¹
(In percent)

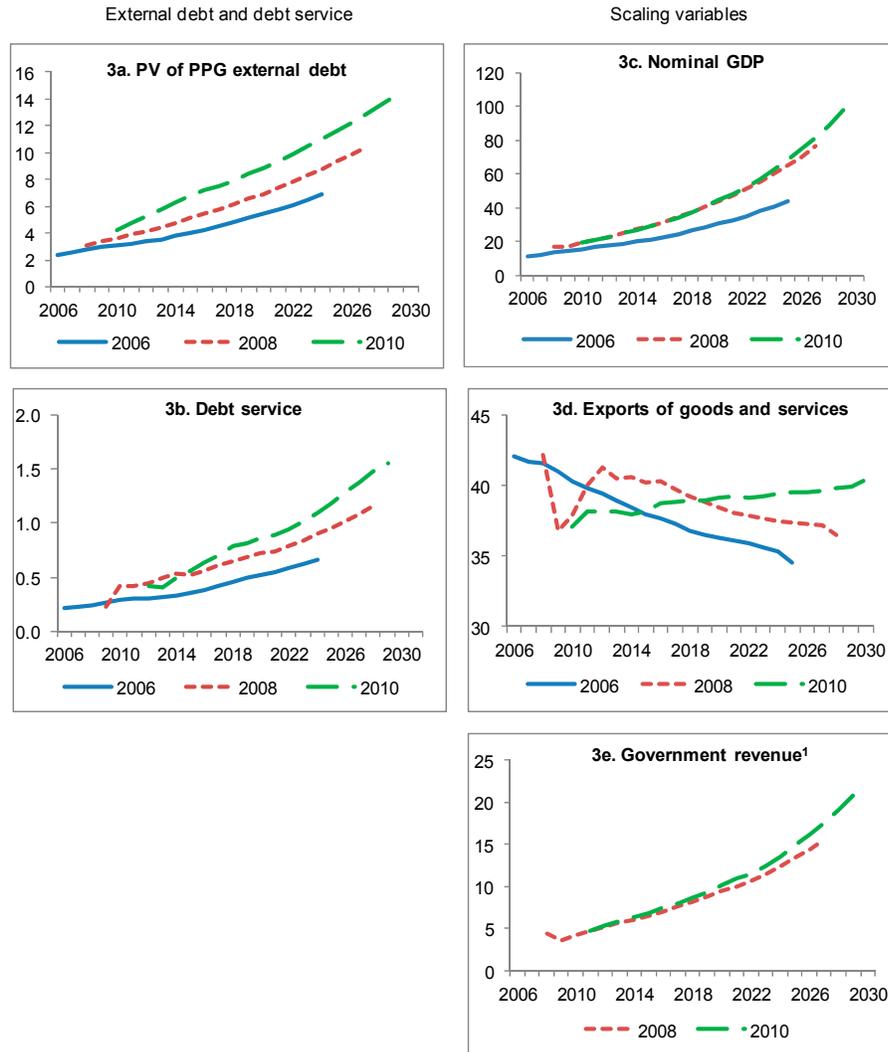


Sources: Country authorities; and staff estimates and projections.

¹ Excludes Djibouti and Tonga due to a lack of data for historical scenario in 2010 DSA.

We next analyze trends in the numerators and denominators of the key debt ratios. The paths for both the external debt and debt service series—the numerators in the key baseline debt ratios above—increased significantly in both 2008 and 2010 vintages (Figures 3a and 3b). Meanwhile, the scaling variables—nominal GDP, exports, and government revenues—the denominators—were also projected higher at the longer maturities, particularly in 2008 relative to 2006, and to a lesser extent in 2010, which helps explain the improvement in the ratio projections along the three DSAs (Figures 3c, 3d, and 3e), and the tendency for the baseline ratios in Figure 1 to converge over the projection horizon, even in the wake of the global shock. This trend implies that long-run macroeconomic performance (GDP, exports and revenues) is projected to improve: the effects of the greater debt burdens that resulted from the food/fuel and global shocks are deemed transitory and are more than offset over time by assumed stronger long-run economic performance.

Figure 3. Debt and Macroeconomic Projections, 2006–29
(In billions of US\$)



Sources: Country authorities; and staff estimates and projections.
¹ Excluding grants.

B. Numerators: Trajectories of debt, debt service and financing needs

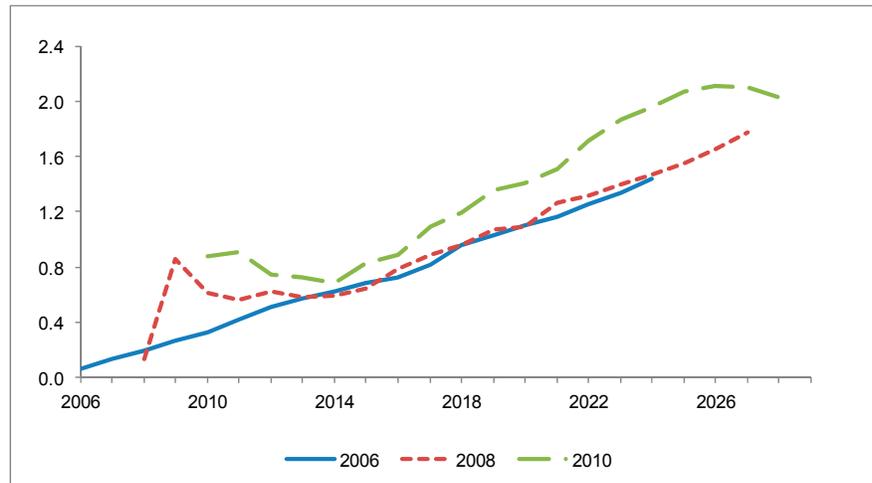
Estimates of the paths of external debt (in present value terms) shifted upward in both 2008 and 2010 (Figure 3a). The increases were more pronounced in the longer run (an average increase of 1.2 percentage points for 2013 projections in the 2008 and 2010 paths, compared with 2.1 percentage points on average for the 2024 projections). In the first instance, the increases in new debt disbursements likely reflect the increase in borrowing space accommodated by prior debt relief initiatives and more stable macroeconomic conditions and improved policies, and driven by pressing infrastructure needs that would help LICs achieve the millennium development goals. In the second period, the global crisis implied an increase in financing needs projections, both externally (through projected decreases in export

revenues and FDI), as well as internally (through countercyclical fiscal spending and lower revenue projections). It may also reflect the impact of changes in Fund policies on borrowing by LICs around the time of the global crisis. In particular, the Fund introduced a new architecture of facilities for LICs in 2009, designed to make the facilities more flexible and responsive to the diverse needs of LICs (see IMF 2009e). It doubled access limits on concessional lending (IMF 2009f), and introduced more flexible guidelines on external debt limits in Fund-supported programs (IMF 2009c). Although the Fund's financing role in LICs is normally designed to be catalytic and typically covers a smaller portion of LICs' protracted financing needs, these combined measures enabled LICs to take on more debt in some cases to finance investment in high return, macro-critical infrastructure.

Figure 4 shows the projected evolution of average financing needs¹⁵ in billions of US dollars. 2008 vintage medium- to long-term paths follow closely those of 2006. The emerging effects of the food and fuel shock may be partly reflected in the temporary spike in 2009. There is a notable increase in projected financing needs in the 2010 vintage DSAs throughout the horizon, reflecting the combined food/fuel shocks and global crisis. In aggregate terms, the increases in financing needs over the projection period in large part stem from higher debt service burdens—principle and interest payments on outstanding debt (Figure 3b). Almost all countries had positive financing needs in 2010 and, for some countries, the crisis led to sharp upward revisions. Moreover, the share of debt-service in financing needs increased in both 2008 and 2010 DSAs: for 2010 DSAs, it represents in aggregate terms between 60 percent and 80 percent of total annual financing needs. While the majority of LICs' external debt is from official bilateral and multilateral sources, and typically longer-term, the increasing share of shorter-term non-concessional debt held by private external creditors may present greater rollover risks.

¹⁵ In the external DSA, financing needs refers to the country's gross external financing needs: debt and debt service falling due plus the non-interest current account deficit.

**Figure 4. Financing Needs, 2006–29
(In billions of US\$)**

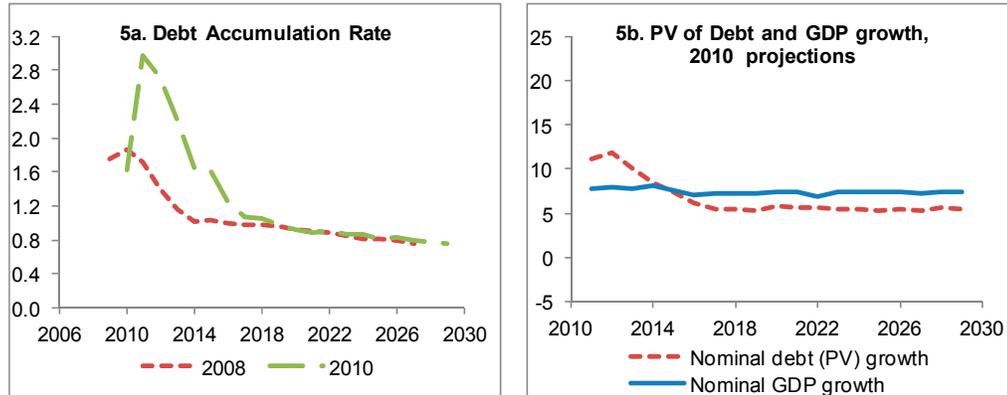


Sources: Country authorities; and staff estimates and projections.

The increased financing needs in 2010 DSAs are reflected in higher projected debt accumulation rates for a number of countries over the short- to medium-term (Figure 5a). The crisis drove the projections of growth of the NPV of PPG external debt temporarily above that of nominal GDP growth for some countries¹⁶ (Figure 5b), but its projected reversal over the long run helps ensure debt trajectories are not explosive. It is explained both by a slowdown in debt accumulation and by a quick recovery in growth of the scaling variables. Post-crisis scenarios perhaps also reflect a belief that LICs, even as the global outlook remains very uncertain, are able to implement appropriate (fiscal) policy adjustments following their countercyclical responses to the shock.

¹⁶ Bolivia (until 2017), Burkina Faso (2016), Cameroon (2024), Ghana (2016), Guyana (2013), Honduras (2014), Lesotho (2018), Mozambique (2015), Tajikistan (2016), Tanzania (2017), Tonga (2012), Vietnam (2013), and Yemen (2016).

**Figure 5. Debt Accumulation Dynamics, 2006–29
(In percent)**



Sources: Country authorities; and staff estimates and projections.

C. Changing structures of indebtedness

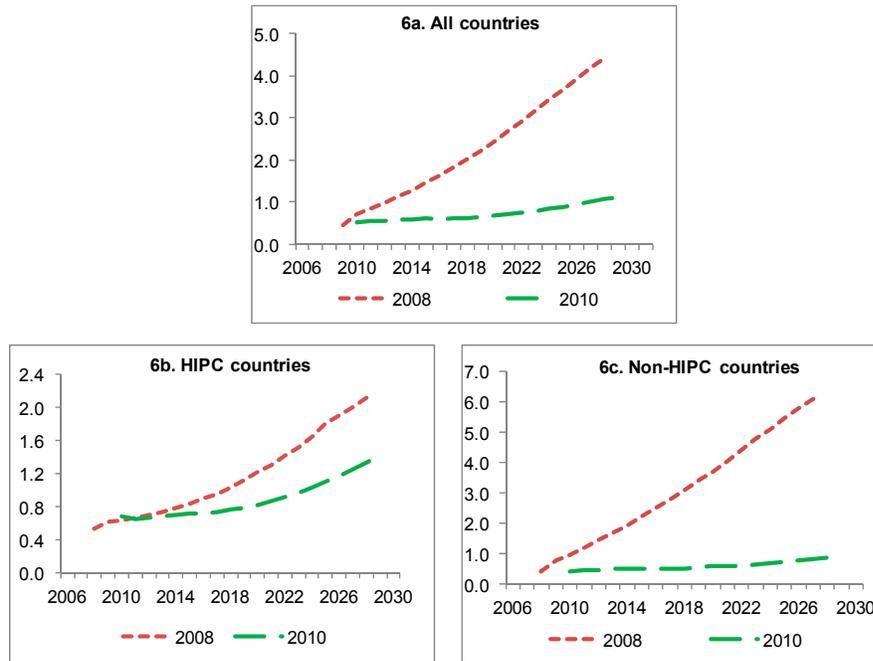
While this paper focuses on PPG external debt, there is evidence that the composition of LICs' external debt itself has shifted towards greater reliance on non-concessional sources of financing. This may have resulted from the aforementioned changes to the IMF's debt limits policy in 2009, which provided more flexibility to LICs to take on non-concessional debt.¹⁷ It may also partly reflect cut-backs in aid flows and commitments to LICs due to crisis-induced budgetary pressures in donor countries, forcing greater reliance on non-concessional sources.

Projected aid flows in DSAs were revised sharply downward in the aftermath of the crisis (Figure 6a), although the pattern differs for different groups of countries. The downward revision to projected aid flows appears to be much more pronounced for non-HIPC than HIPC countries¹⁸ (Figures 6b-c) perhaps reflecting the effort of the international donor community to ensure financing at good conditions for the latter group of countries.

¹⁷ See IMF (2009c) and IMF (2009d).

¹⁸ HIPC-eligible countries included in the sample are: Bolivia, Burkina Faso, Cameroon, Chad, Comoros, Ghana, Guyana, Honduras, Kyrgyz Republic, Mauritania, Mozambique, and Tanzania.

Figure 6. Aid Flows, 2006–29
(In billions of US\$)

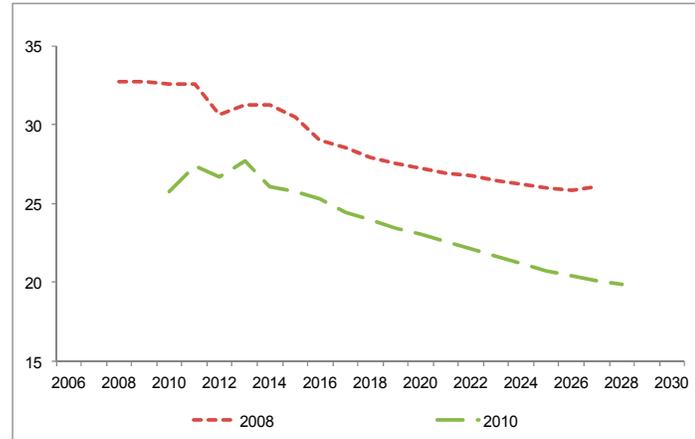


Sources: Country authorities; and staff estimates and projections.

The average grant element of new disbursements has been revised downward between 2008 and 2010 (Figure 7). In the earlier vintage DSAs, the average grant element in new disbursements was about 32 percent over the short run,¹⁹ about 5 percentage points above that projected in the first few years in the 2010 vintage, possibly reflecting the growing share of non-concessional financing in LICs' external debt. The concessionality of new disbursements is projected to decrease sharply over the DSA horizon, perhaps reflecting graduation by some LICs to market access status.

¹⁹ Fund programs for LICs typically stipulate minimum concessionality for new disbursements of 35 to 50 percent.

**Figure 7. Average Grant Element in New Disbursements, 2006–29¹
(In percent)**

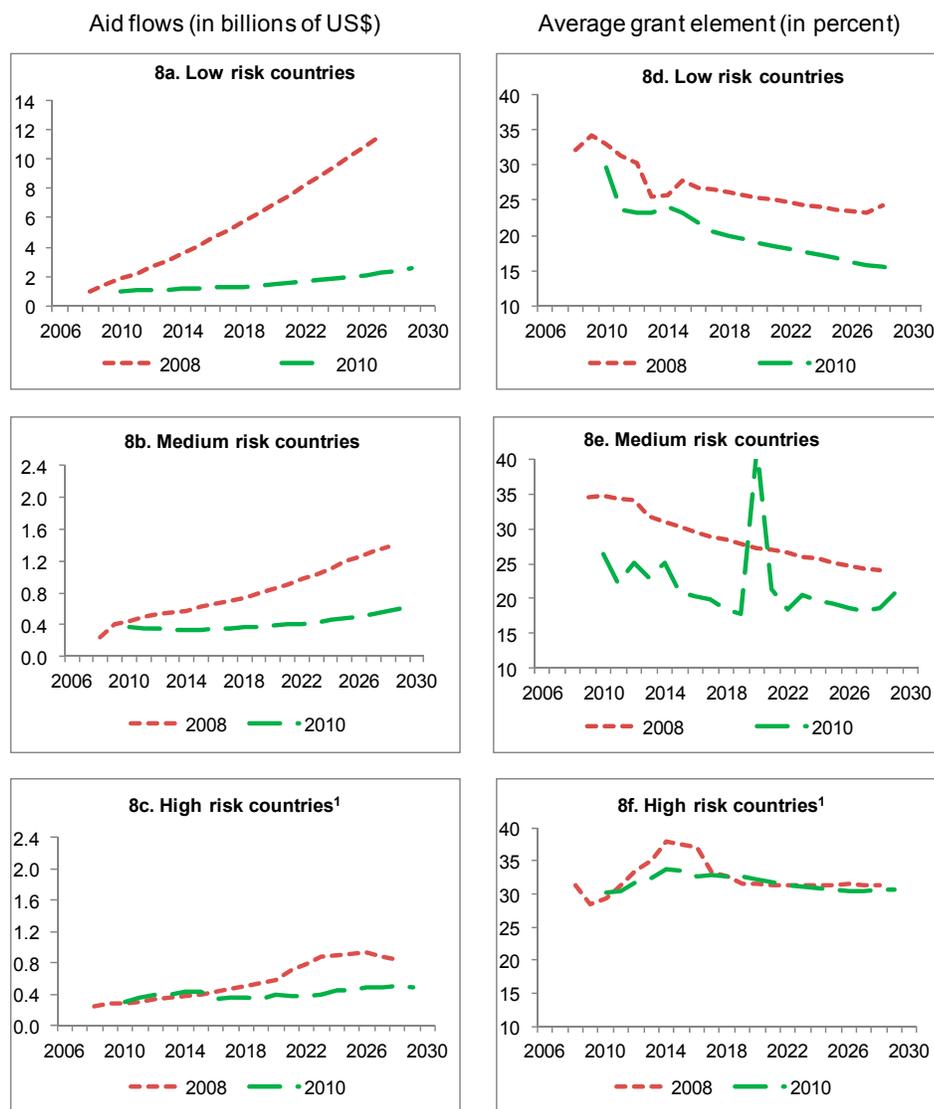


Sources: Country authorities; and staff estimates and projections.
¹ Excluding Lesotho due to outliers in 2020 and 2030, in 2010 DSA.

Dividing the sample according to countries' DSA risk ratings reveals some differences (Figure 8).²⁰ The average grant element of high-risk countries exhibits no downward trend through time (Figure 8f), but declines for low- and medium-risk countries, which would be consistent with the market access/graduation hypothesis (Figures 8d and 8e). It could also be influenced by changes in the Fund's debt limits policy, as noted above, although the timing of the policy change (late 2009) may not yet have had a strong influence on 2010 DSAs. Interestingly, the projected grant element for high-risk countries shifts upward in 2010 post-crisis vintage DSAs,²¹ but downward for low- and medium-risk countries. Projected average aid flows dropped for all groups of countries in 2010 vintage DSAs (Figures 8a-c).

²⁰ As noted in Box 1, the DSA assigns each country a risk rating based on the results of the external DSA analysis. The four categories are low-, moderate-, and high-risk, or in debt distress. In the 2010 sample, 8 countries were judged low-risk, 13 moderate-risk, and 8 as high-risk or in debt distress. The observations in this paragraph are especially tentative owing to the small subsamples.

²¹ This result seems to be driven mainly by the following countries: Burkina Faso, Comoros and Djibouti.

Figure 8. Aid Flows and Average Grant Element, 2006–29

Sources: Country authorities; and staff estimates and projections.

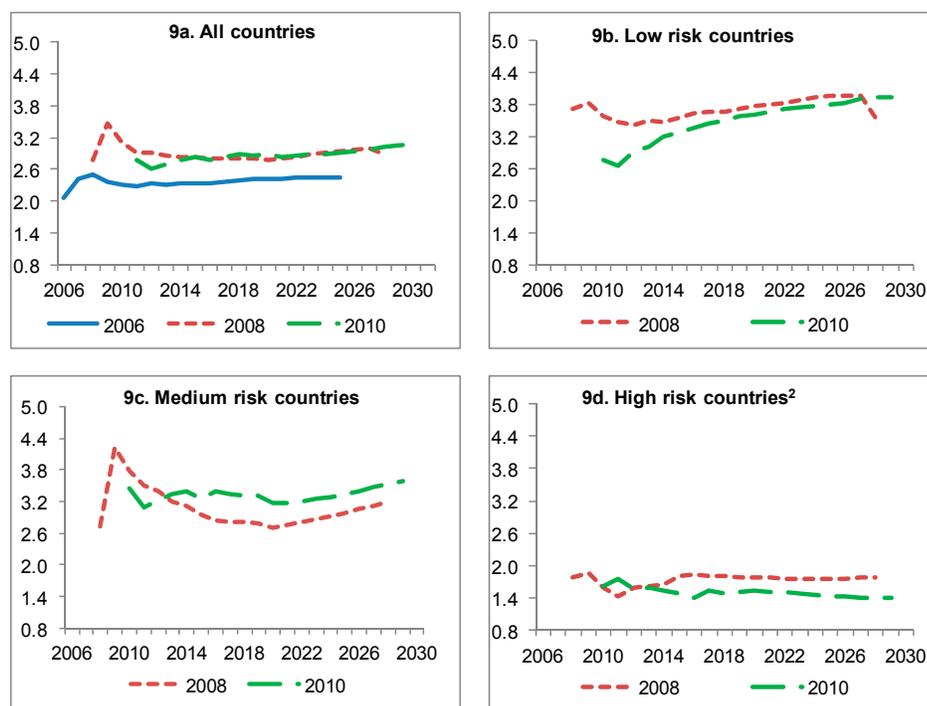
¹Including countries in debt distress.

Interest rates paid on debt have increased. Interest rates applicable to LIC external borrowing are to a large extent disconnected from market yields, as most LIC debt is concessional and from official sources. The average projected effective interest rate²² on external borrowings for sample countries rose from about 2.4 percent in 2006 DSAs to about 3.0 percent in 2008/2010 DSAs (Figure 9a). This may partly reflect the previously discussed shift in the

²² Defined in the DSA as current-year interest payments divided by previous period debt stock.

composition of debt from aid and grants to non-concessional borrowing. As expected, the projected path of the average interest rate for high-risk countries is significantly lower than for low- and medium risk countries (Figures 9b-d), reflecting the former's greater recourse to concessional borrowing.

Figure 9. Average Interest Rate, 2006–29¹
(In percent)



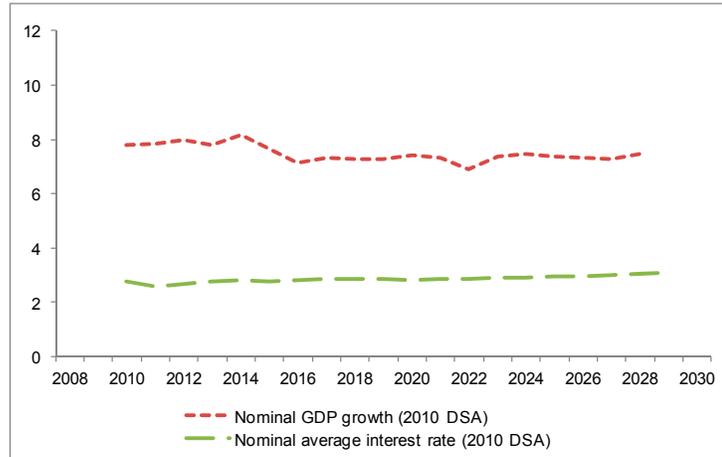
Sources: Country authorities; and staff estimates and projections.

¹Grouping according to CPIA rating is not available for 2006 due to lack of data.

²Including countries in debt distress.

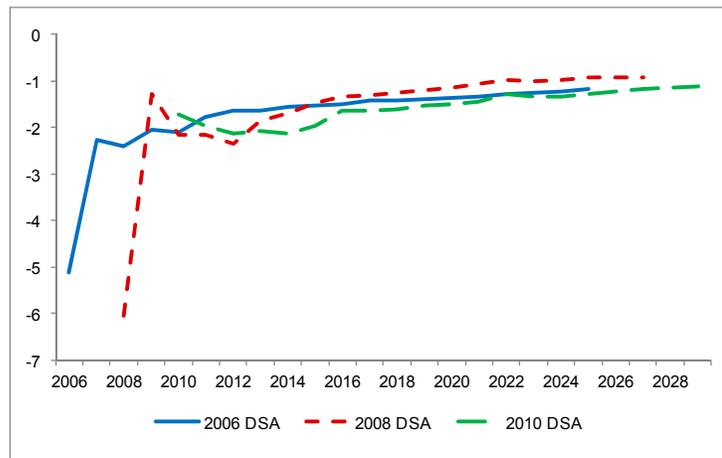
Projected average nominal interest rates lie comfortably below nominal GDP growth for most countries (Figure 10). In all three DSA vintages, endogenous debt dynamics are negative throughout the projection period (Figure 11). Endogenous debt dynamics describe the evolution of debt-to-GDP ratios depending on the prevailing nominal interest rate and the expected evolution of real GDP growth, prices and the exchange-rate, independent of new financing. This means that the evolution of real GDP growth, inflation and the exchange-rate relative to the nominal interest rate on the existing debt leads to a decrease in the existing debt-to-GDP ratio. This trend is explained by the fact that average interest rates are low for LICs, while nominal GDP growth prospects in USD terms are substantially higher. The endogenous debt dynamics contribute to explain why, despite higher new borrowing, LICs debt ratios continue on a downward trend.

**Figure 10. Nominal GDP Growth-Interest Rate Differentials, 2010–29
(In percent)**



Sources: Country authorities; and staff estimates and projections.

**Figure 11. Endogenous Debt Dynamics, 2006–29
(In percentage points)**



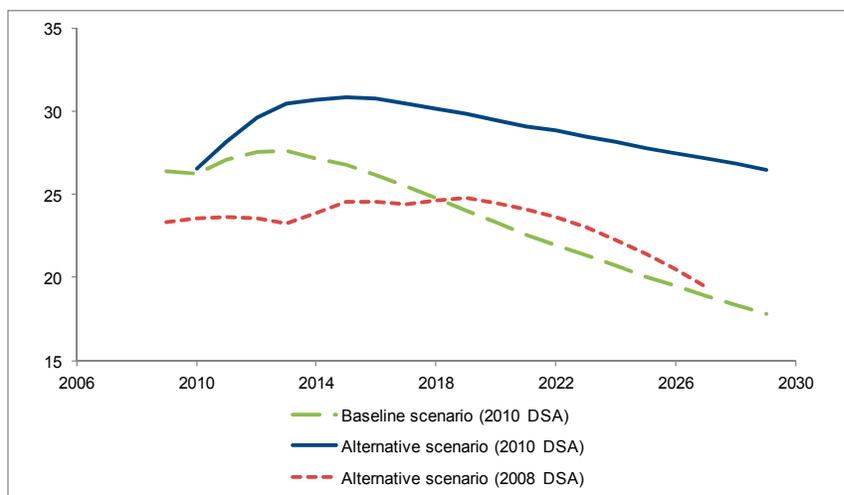
Sources: Country authorities; and staff estimates and projections.

DSA stress tests highlight the risks associated with higher interest charges (Figure 12). For the greatest number of sample countries, the highest debt ratio path is obtained with the less favorable financial conditions scenario.²³ Furthermore, the deterioration of debt ratios associated with this alternative scenario is stronger in 2010 DSAs due to a higher base

²³ The alternative scenario of less favorable financial conditions assumes a nominal interest rate 200 basis points higher than in the baseline scenario (see Box 1).

interest rate. This underscores the vulnerability of LICs to the structure of their indebtedness, and the need for concessional lending to support debt sustainability, as small changes in financing conditions can have a strong impact on future debt ratios. LICs' debt profiles also appear to remain particularly vulnerable to exchange rate shocks, which would automatically lead to a rise in the debt burden, given the foreign currency denomination of external debt.

Figure 12. PV of Debt-to-GDP Ratio: Comparative Analysis of Alternative Scenario of Less Favorable Terms on Public Sector Borrowing, 2006–29 (In percent)



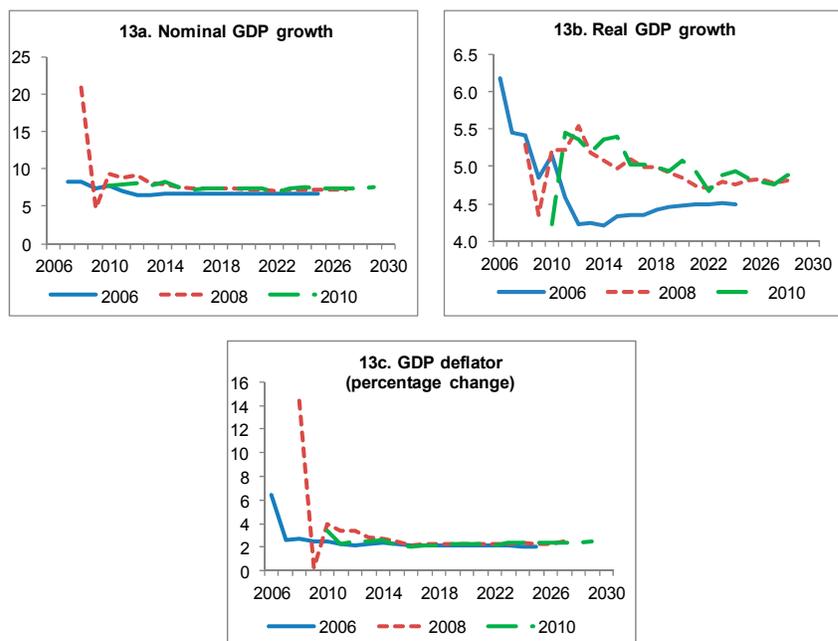
Sources: Country authorities; and staff estimates and projections.

D. Denominators: adjustments in macroeconomic projections

Despite being affected by the global crisis shocks in the short term, scaling variables converge to their pre-crisis level in the long run and even improve in some cases (Figure 1). In the first part of the decade prior to the onset of the food and fuel crisis, many LICs posted strong economic performance aided by a favorable global environment. The multiple shocks after 2007 altered the outlook and led to sharp, temporary adjustments in key macroeconomic variables. The inflation spike (Figure 13c) that resulted from the food and fuel shock significantly altered the projected path of LICs' nominal GDP in 2008 DSAs (Figure 3c). While GDP deflators for all vintage DSAs quickly converge to long-run values of about 2 percent (Figure 13c), the assumed long-run paths for real GDP growth show a significant break between 2006 and 2008/2010 vintage DSAs. Specifically, average projected real growth in the latter DSAs slumps in 2009 and 2010, but shifts significantly higher throughout the remaining projection period (Figure 13b), some of which in the earlier years could possibly reflect cyclical convergence toward full employment positions following the presumed rebound out of the global recession. Almost half of the countries in the sample

have had upward revisions of real GDP growth projections in 2010.²⁴ For some countries, the increase in nominal GDP is due to upward revisions in inflation and exchange rate forecasts (domestic currency appreciation in US dollar terms).²⁵

**Figure 13. Macroeconomic Forecasts, 2006-29
(In percent)**



Sources: Country authorities; and staff estimates and projections.

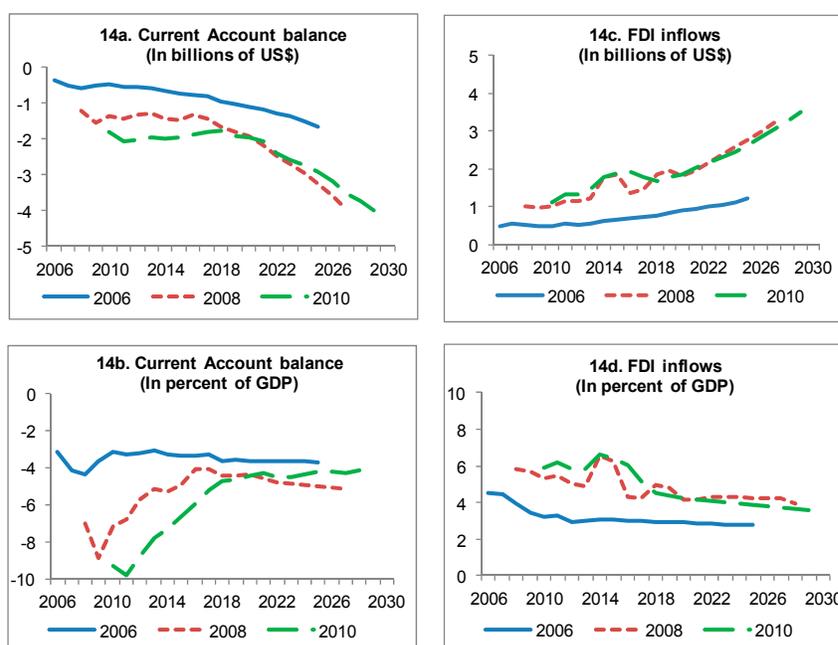
While the absolute annual differences in projected GDP growth are small—averaging about $\frac{1}{2}$ of one percent per year—these changes are compounded over the horizon, boosting nominal GDP significantly. Moreover, the persistent, if only slight, increase in nominal GDP growth projections help explains why, in the face of combined shocks that drive short-run debt burdens higher (Figures 3a and 3b), debt-to-GDP ratios remain on a manageable, downward path (Figure 1a). The persistent increase in nominal GDP growth projections offsets debt shocks: for the baseline ratios, the positive change in the growth in scaling variables (denominators) is in 2010 DSAs projected to exceed changes in the growth in debt variables (numerators).

²⁴ Bolivia, Burkina Faso, Cambodia, Comoros, Djibouti, Georgia, Guyana, Lesotho, Mauritania, Mozambique, Myanmar, Tanzania, Tonga, and Vietnam.

²⁵ Angola, Cambodia, Comoros, Georgia, Lao PDR, Mauritania, Mozambique, Nepal, Tajikistan, Tonga, and Vietnam.

On the external side, LIC exports are seen to fall in the short-run in 2008 and 2010 DSAs, plausibly in response to the unfolding global slowdown (Figure 3d). Average exports however at the distant horizon in 2010 DSAs noticeably exceed those for 2006 and 2008 vintages. This helps explain the stronger end-of-projection outcomes of debt-to-exports (Figure 1b) and debt service-to-exports (Figure 1d) ratios. While current account balances suffer in response to the shocks (Figures 14a and 14b), in aggregate terms scaled to GDP they stabilize at slightly higher deficit levels (-4.1 percent of GDP in 2010 DSAs against -3.7 percent in 2006 DSAs). Meanwhile, there is no strong evidence in DSA projections of a sharp fall off in FDI inflows in the wake of the global crisis—2008 and 2010 FDI flows follow similar paths (Figures 14c and 14d).

Figure 14. External Accounts Forecasts, 2006–29



Sources: Country authorities; and staff estimates and projections.

E. Country-level heterogeneity

To this point this paper has presented aggregate data based on key DSA variables for the 29 sample countries. These simple averages mask the diversity in the evolution of the variables across the sample countries, whose circumstances are strongly influenced by idiosyncratic domestic characteristics, including socio-political conditions, institutional capacity, and natural disasters. This diversity is partly reflected in heterogeneous DSA risk ratings. Nevertheless, common underlying trends do appear to explain the evolution of DSA results.

Tables 3a and 3b present a simple “heat map” of changes in key projections of DSA variables over the period 2010/15-2025 for each country. Table 3a compares the *average* projected

value for ten variables over the 15 year period starting from 2010 for 2008 DSAs against 2006 DSAs for all sample countries (for which published results are available). Table 3b compares 2010 DSA projections against 2008 DSA projections over the period from 2015-25. Projections that have moved in a “positive” direction (e.g., lower debt-to-GDP ratio, stronger real GDP growth, lower current account deficit) are shown in green (dark color), while “negative” evolutions are shown in red (light). The heat maps highlight common trends in the sample as well as country-level heterogeneity.

As noted, projected debt-to-GDP ratios improved in 2008 compared with 2006 DSAs (Table 3a., column a.), driven by stronger GDP outlooks (columns b. and c.). This was despite higher projected external debt burdens in about half the sample (column d.). In contrast, these ratios worsened in 2010 DSAs compared to 2008 for most countries due to higher debt projections and less favorable output growth prospects for most sample countries (Table 3b).

Debt service (column i.) trended higher for most countries across both periods, reflecting in part higher debt stocks. Projected financing needs (column f.) rose in 2010 DSAs for more than two-thirds of the countries. Meanwhile, the average grant element of new disbursements (3a., column j.), which improved in 2008 forecasts compared with 2006, worsened for most sample countries in the later period (3b., column j.), reflecting the deterioration in external financing conditions in the post-crisis period. On the external side, current account projections (column g.) deteriorated in 2008—financed partly by stronger foreign direct investment (FDI, column h.), a situation that was largely reversed in 2010.

Table 3. Evolution of Key Variables in DSAs

Table 3a. Variation in average projections over 2010-2025 in 2008 DSAs compared to 2006

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	
	NPV PPG debt to GDP ratio	Nominal GDP (in USD)	Real GDP growth (in local currency)	PV PPG external debt (in USD)	Interest rate (in percent)	Financing needs (in USD)	CA (in USD)	FDI (in USD)	Debt service (in USD)	Grant element of new disbursements (in percent)	DSA Risk Rating 2008
Bangladesh											Low
Bolivia											Low
Burkina Faso											High
Cambodia											Moderate
Cameroon											Low
Chad											Moderate
Comoros											In debt distress
Dominica 1/											
Georgia											Low
Ghana											Moderate
Honduras											Low
Kyrgyz Republic											Moderate
Lao PDR											High
Lesotho											Moderate
Mauritania											Moderate
Moldova											Low
Mozambique											Low
Nepal											Moderate
Papua New Guinea											Moderate
Solomon islands											Moderate
Tajikistan											High
Tanzania											Low
Tonga											High
Vietnam											Low

1/ No risk rating was explicitly specified in the 2008 DSA.

Table 3b. Variation in average projections over 2015-2025 in 2010 DSAs compared to 2008

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	
	NPV PPG debt to GDP ratio	Nominal GDP (in USD)	Real GDP growth (in local currency)	PV PPG external debt (in USD)	Interest rate (in percent)	Financing needs (in USD)	CA (in USD)	FDI (in USD)	Debt service (in USD)	Grant element of new disbursements (in percent)	DSA Risk Rating 2010
Bangladesh											Low
Bolivia											Low
Burkina Faso											High
Cambodia											Moderate
Chad											Moderate
Comoros											In debt distress
Dominica											Moderate
Georgia											Moderate
Ghana											Moderate
Honduras											Low
Kyrgyz Republic											Moderate
Lao PDR											High
Lesotho											Moderate
Mauritania											Moderate
Moldova											Low
Mozambique											Low
Nepal											Moderate
Solomon islands											Moderate
Tajikistan											High
Tanzania											Low
Tonga											High
Vietnam											Low
Yemen											High

	Projections worsened.		Projections improved.
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Five countries (Dominica, Georgia, Ghana, Mauritania, and Mozambique) have seen their debt-to-GDP ratios worsen across both sets of DSAs: 2008 external debt projections for each of these countries exceeded those from 2006; in 2010 the outlook for nominal GDP (in USD) was revised downwards for four of the five, which resulted in the deterioration in the debt ratio (in Mozambique, the increase in debt outweighed the improvement in GDP). In contrast, three other countries (Nepal, Solomon Islands, and Tonga) experienced debt-to-GDP ratio improvements from 2006 to 2010, driven primarily by stronger nominal GDP projections.

The Appendix includes separate charts showing evolution of a number of key DSA variables for each of the sample countries, which highlights the diversity across countries and evolution across DSAs (Figures A1–A22).²⁶ The panels may suggest some risks.

- In 2010, more than half of the sample countries were expected to face debt growth rates that exceeded GDP growth over the near term (Figure A14—Bolivia, Burkina Faso, Chad, Dominica, Georgia, Ghana, Guyana, Honduras, Kyrgyz Republic, Lesotho, Moldova, Mozambique, Tajikistan, Tanzania, Tonga, Vietnam, and Yemen). This underscores the risk that shocks or overestimation of long-run GDP growth could pose for these countries' debt outlooks.
- Nominal growth exceeds the average interest rate (Figure A18), though in several countries the average nominal effective interest rate has been revised materially higher since the first DSA (Figure A17—Bolivia, Chad, Lesotho, Mauritania, and Tanzania).
- Some sample countries are projected to pay high debt service costs in percent of export earnings (Figure A4—in excess of 10 percent for Angola, Comoros, Dominica, Ghana, Nepal, Tajikistan, and Tonga).
- Financing needs are positive and increasing in more than half of sample countries (Figure A11—Burkina Faso, Chad, Comoros, Dominica, Georgia, Ghana, Honduras, Kyrgyz Republic, Lao PDR, Moldova, Mozambique, Tajikistan, Tanzania, Tonga, Vietnam, and Yemen).
- Aid flows were projected to be scaled back significantly in some sample countries in 2010 compared with 2008 (Figure A15—Bangladesh, Burkina Faso, Chad, Comoros, Dominica, Georgia, Ghana, Honduras, Kyrgyz Republic, Vietnam, and Yemen).
- The grant element in new disbursements falls below 20 percent in the near term in five sample countries (Figure A16—Angola, Bolivia, Chad, Ghana, and Vietnam).

²⁶ Figures exclude Myanmar, for which DSAs were not published, and data for other sample countries which were not published or available (as noted in Table 1 and the accompanying footnotes).

IV. CONCLUSIONS

This paper analyzed the evolution of debt sustainability in LICs as assessed in external DSAs. It is based on a broad sample of DSAs available for the years 2006, 2008 and 2010, corresponding to the periods before and after the peak of the global financial and economic crisis. The paper expands on the work on LIC DSAs in two important ways:

First, it analyzes the evolution of projected indicators of debt sustainability in LICs since the implementation of the framework, and more particularly in the context of the global crisis. It shows that in the context of favorable domestic and external growth cycles in the decade prior to the crisis, LIC debt burdens fell. In the wake of the crisis, however, key indicators of debt sustainability deteriorated noticeably on average over short- to medium-term horizons. Nevertheless, long-term projections changed less, and projected ratios have tended to converge to pre-crisis levels.

Second, the paper highlights some trends in DSA assumptions themselves. It shows that DSA projections were sensitive to the contemporaneous global outlook, including over the long term, and this led to significant revisions from one DSA to another. Furthermore, the effect of rising indebtedness projections on ratios has tended to be offset by more favorable macroeconomic prospects.

The aggregate data suggest that LIC debt sustainability improved on the whole during the period prior to the crisis, and that the crisis had a strong short-run impact on key ratios of debt (debt-to-GDP, -to-exports, and -to-fiscal revenues) and debt service (debt service-to-exports, and -to-revenues). Debt indicators following the shock over the longer run are seen on average to return to their pre-crisis levels. Although we do not test for the underlying cause, the longer term trends could result from one or more implicit underlying DSA assumptions, which could be the subject of further study:

- First, that significant fiscal and debt management policy adjustments (lowering debt ratio numerators) will take place in the future, or possibly that LICs will shift borrowing towards domestic debt. This requires LIC government to have the capacity and political will to recover the policy space and consolidate public finances after the countercyclical measures implemented to face external shocks in the period 2007-2009.
- Second, positive outlooks regarding the investment-growth dividend (raising debt ratio denominators), implying higher future growth prospects as a result of current indebtedness. As noted in IMF (2012), the importance of gaining a better understanding of the public investment-growth nexus is well recognized, and work is ongoing, though the issue goes beyond the scope of the DSF. Nevertheless, DSAs should make careful assessments of the expected returns on the specific projects that are financed with new borrowing (and especially those financed on non-concessional terms) and their impact on growth.

- Third, and closely related to the preceding point, positive long-run growth scenarios (also raising debt ratio denominators) based on recent LIC performance and stronger resilience to external shocks demonstrated during the global crisis. Nevertheless, many LICs still face important challenges and remain highly vulnerable. These countries face growing financing needs in the future. The mobilization of external resources will remain a key challenge, and the availability of concessional financing will remain crucial for debt sustainability.

As the trends described in this paper are common to a number of LICs, further study of the underlying assumptions behind these patterns seems warranted. In particular, we think that IMF and World Bank DSAs should place greater emphasis on the evolution of projected debt paths by comparing successive results through time. This could usefully inform discussions on public financing decisions and policy choices, as well as better highlight the appropriateness of underlying assumptions.

With the steady stream of LIC DSAs, the analysis in this paper could be extended and perhaps systematized. The data would allow for more rigorous testing beyond the observations in this paper, including comparison of the DSA projections with actual outturns over time.

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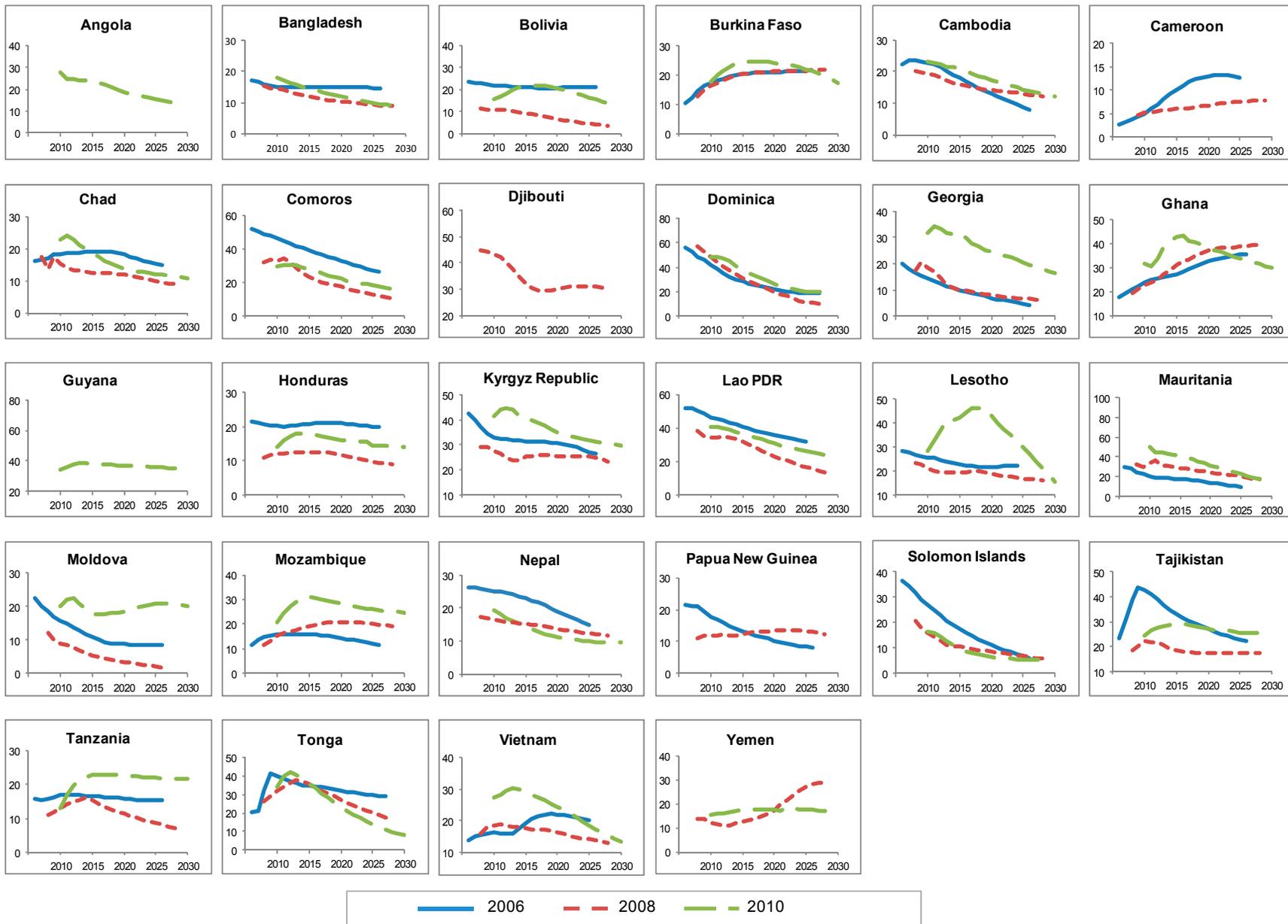
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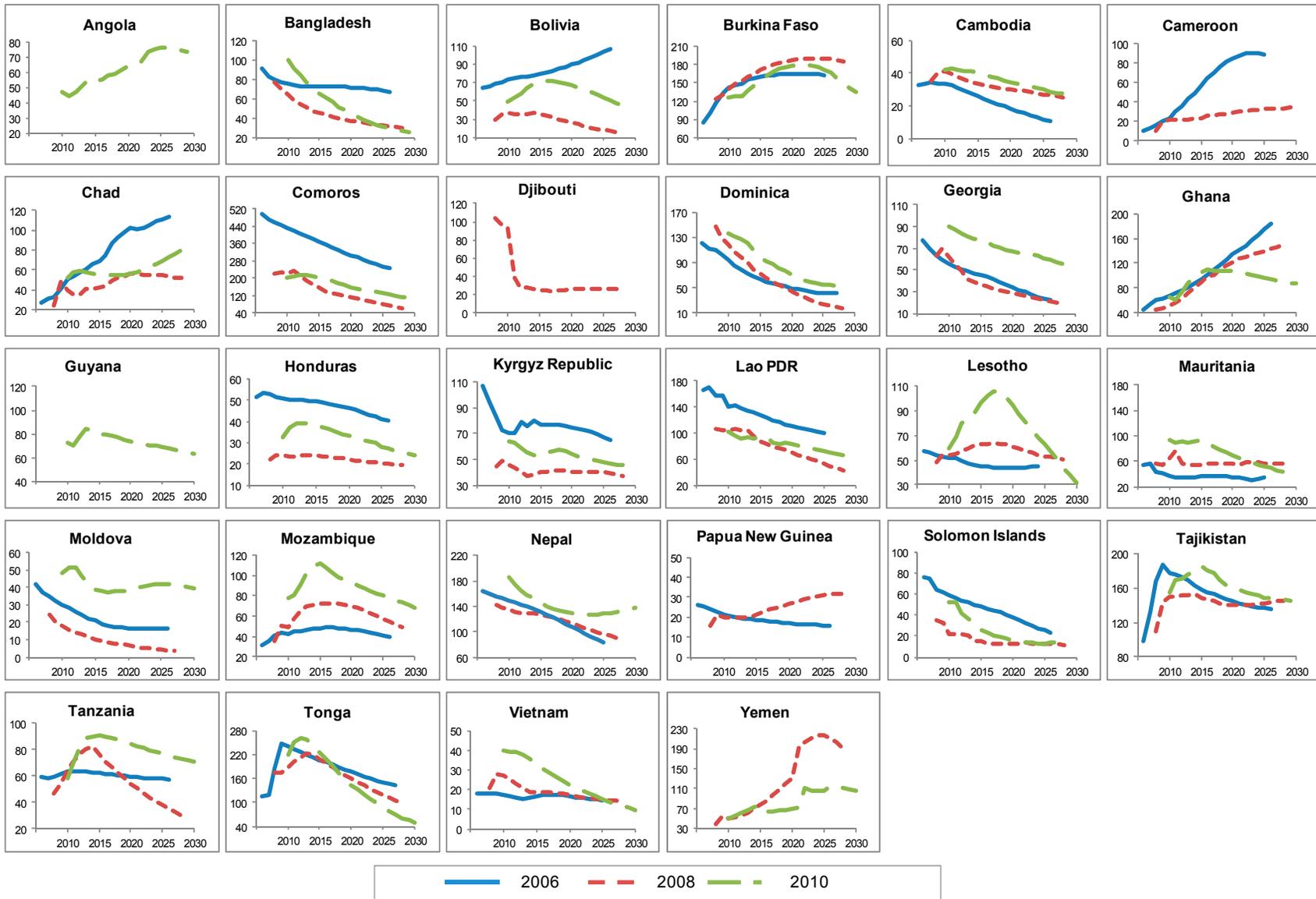
Appendix Figures

Figure A1. PV of Debt-to-GDP Ratio, 2006–29
(In percent)



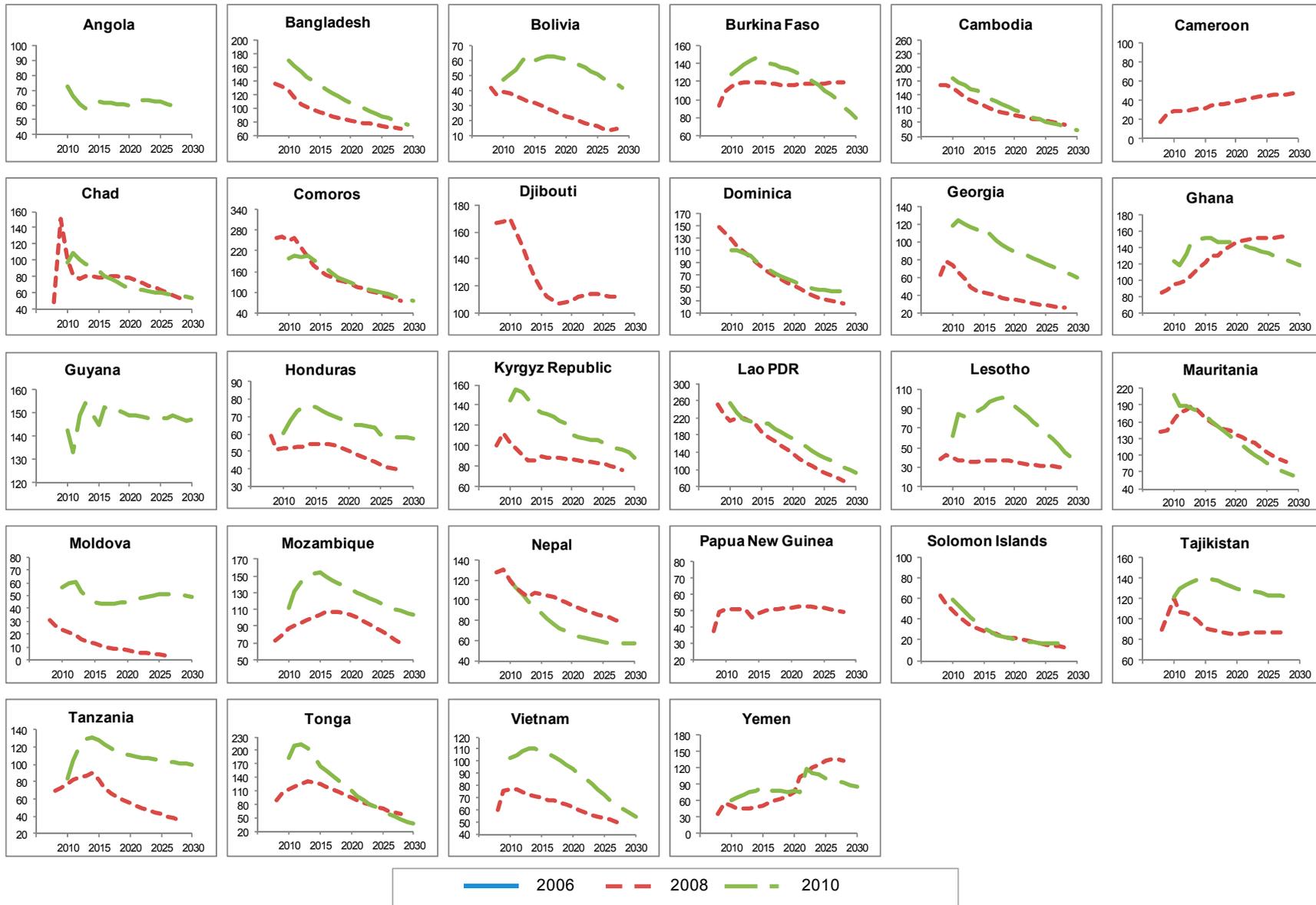
Sources: Country authorities; and staff estimates and projections.

Figure A2. PV of Debt-to-Exports Ratio, 2006–29
(In percent)



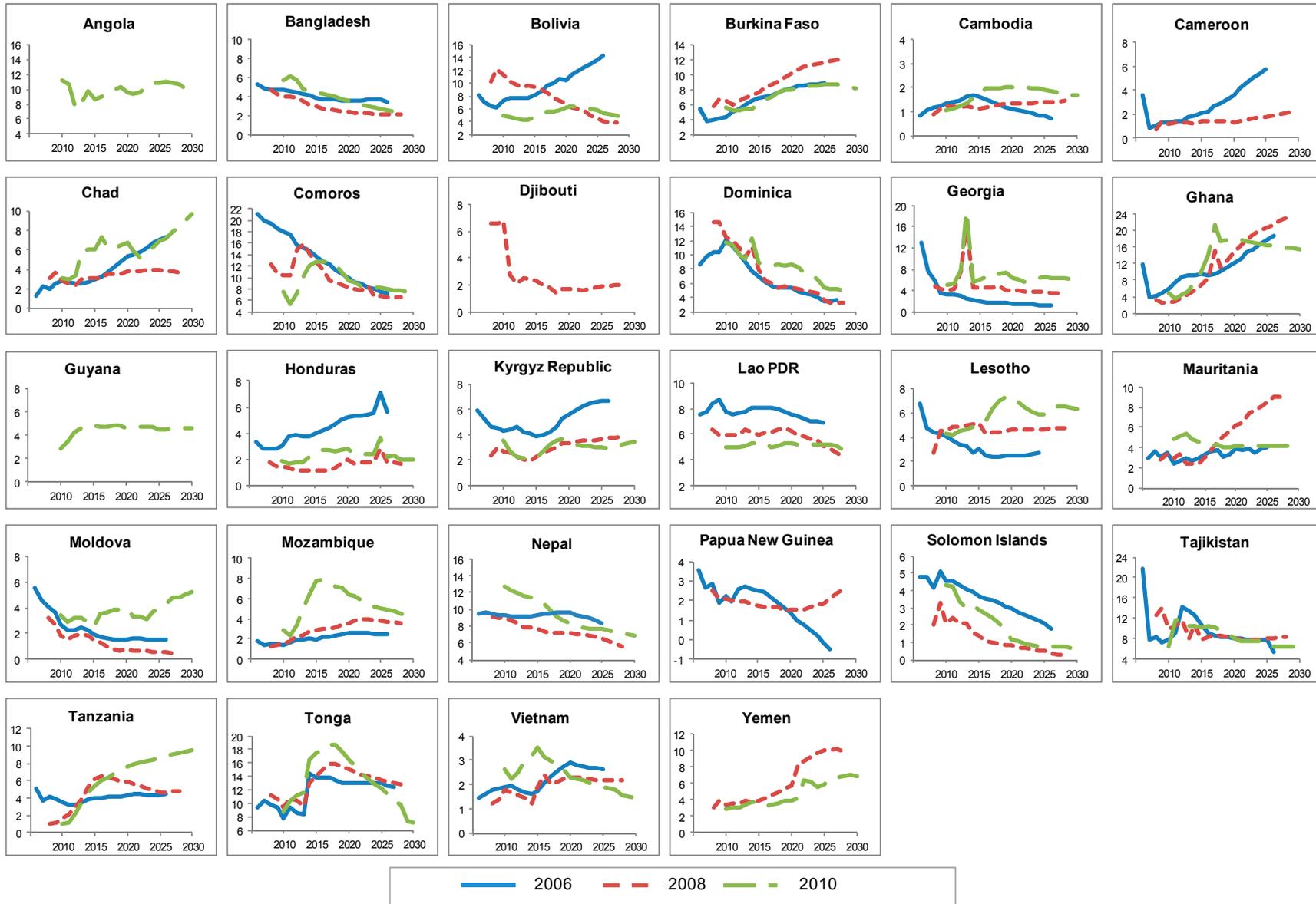
Sources: Country authorities; and staff estimates and projections.

Figure A3. PV of Debt-to-Revenue Ratio, 2006–29
(In percent)



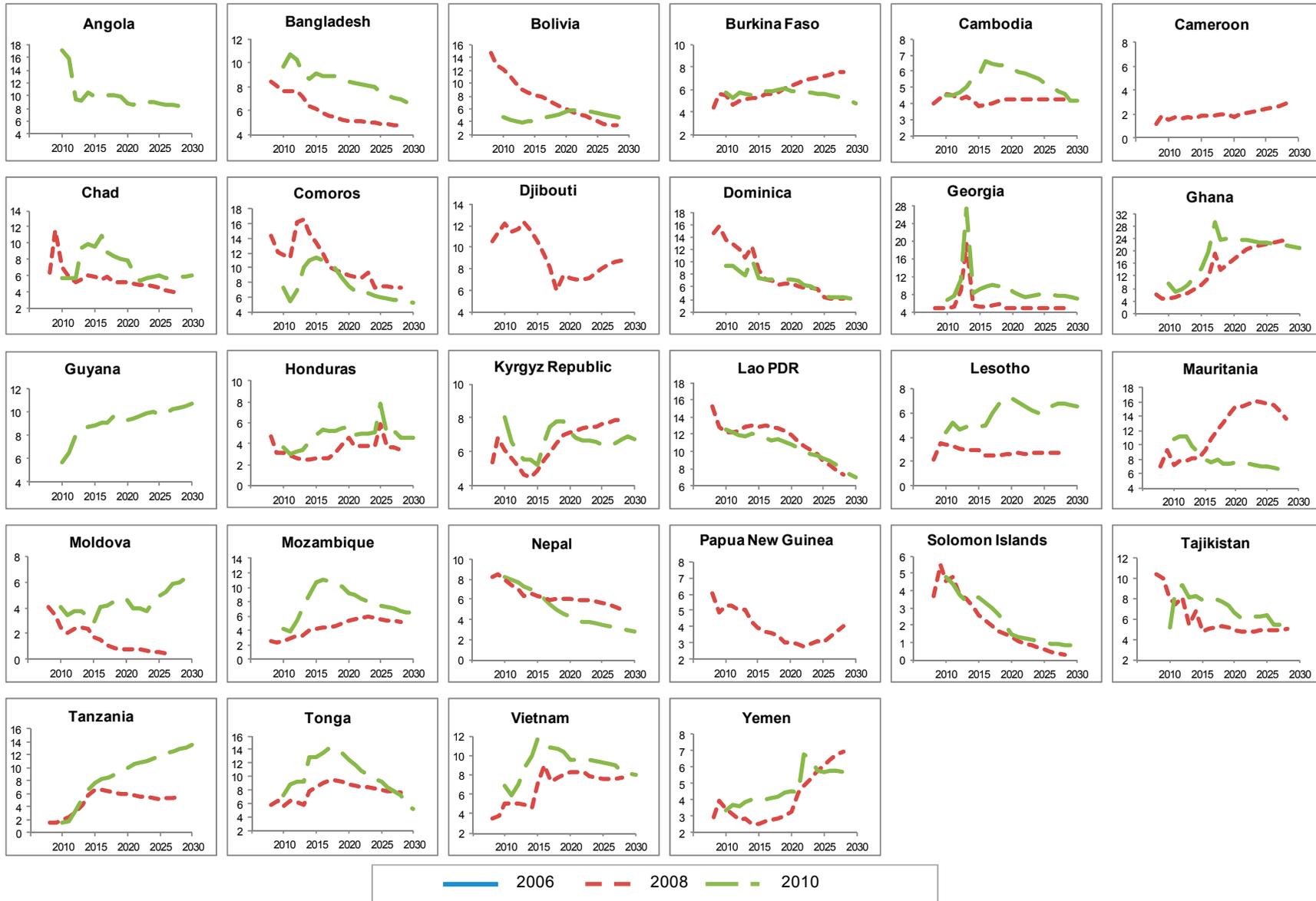
Sources: Country authorities; and staff estimates and projections.

Figure A4. Debt Service-to-Exports Ratio, 2006–29
(In percent)



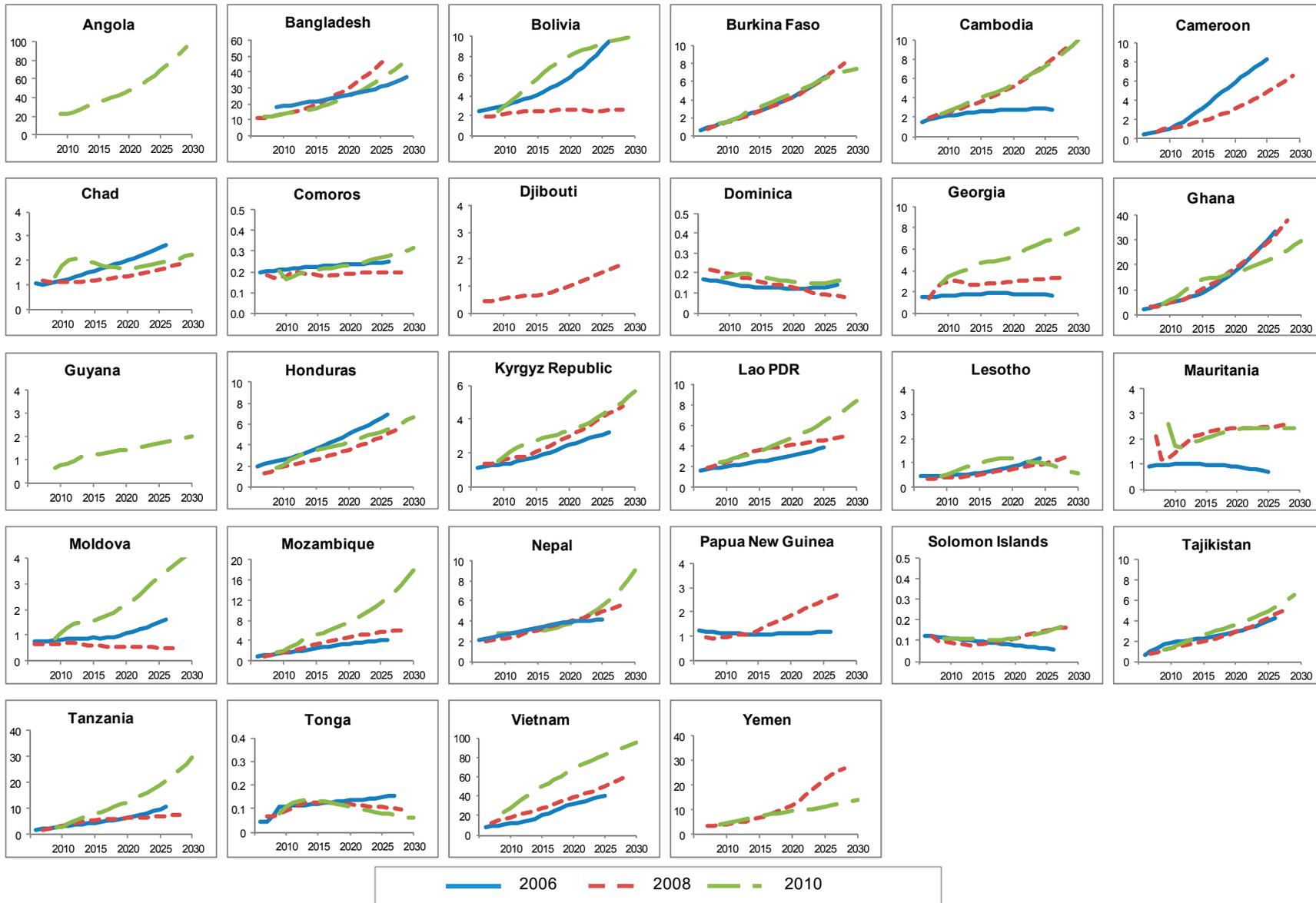
Sources: Country authorities; and staff estimates and projections.

Figure A5. Debt Service-to-Revenue Ratio, 2006–29
(In percent)



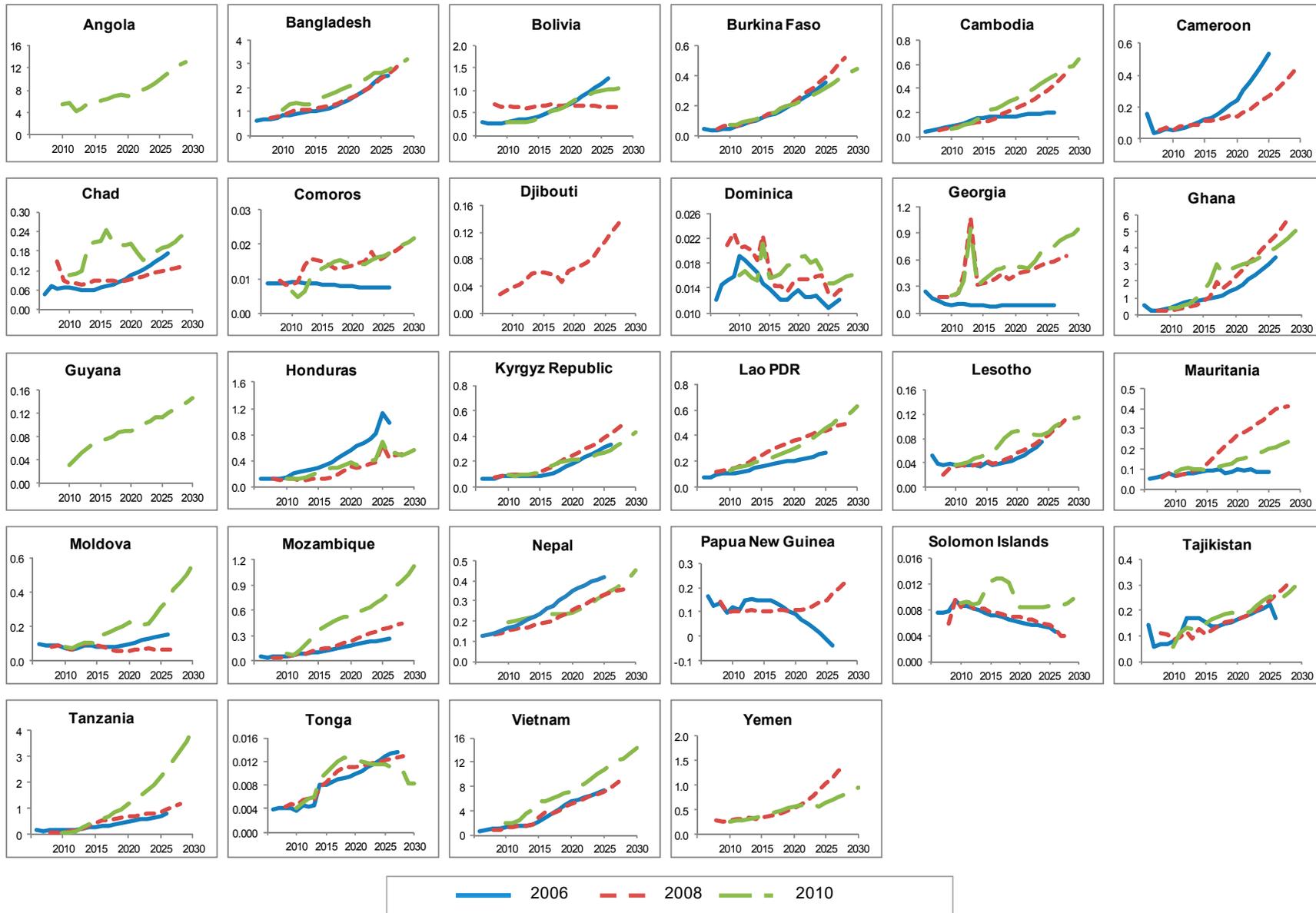
Sources: Country authorities; and staff estimates and projections.

Figure A6. PV of PPG External Debt, 2006–29
(In billions of US\$)



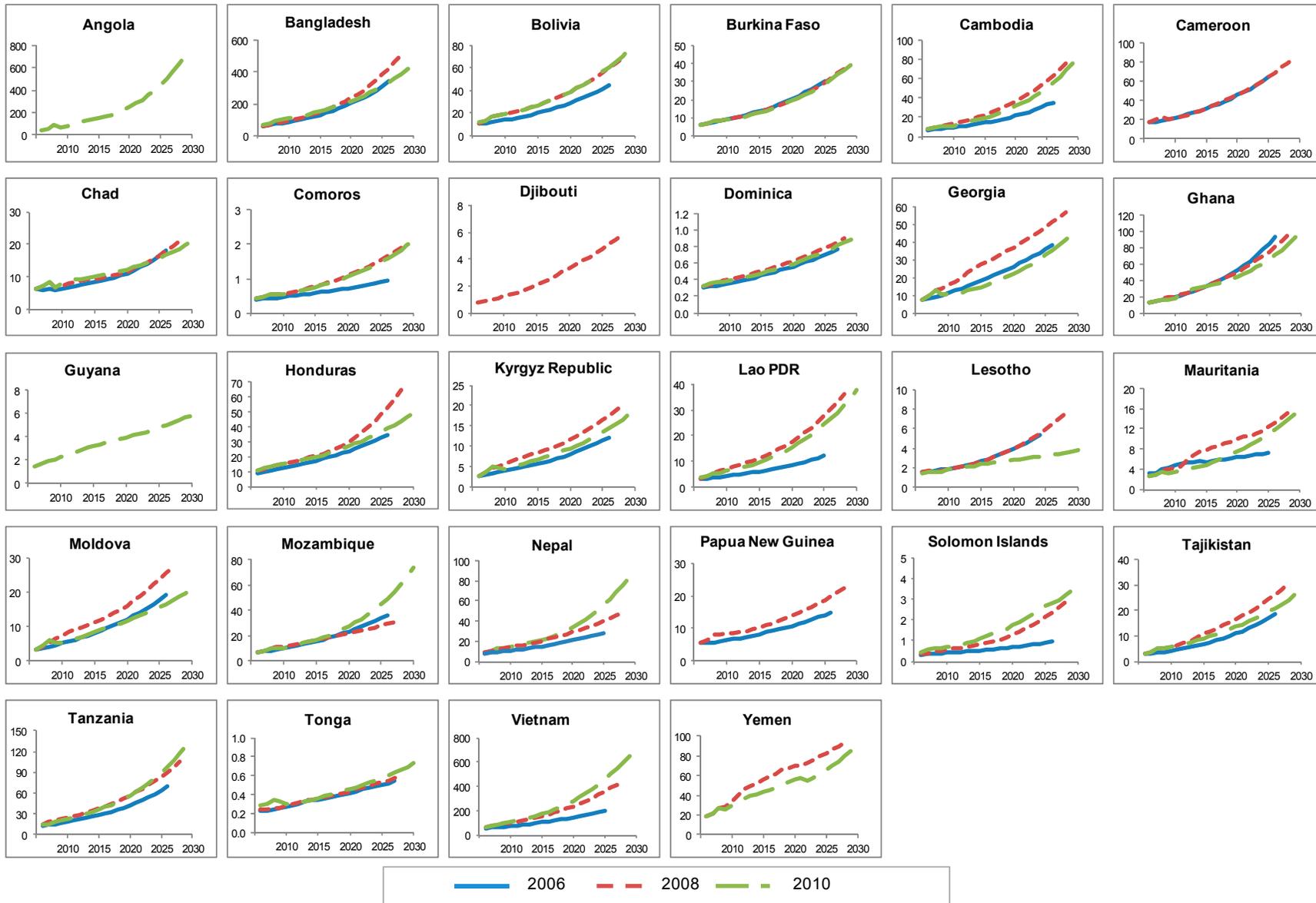
Sources: Country authorities; and staff estimates and projections.

Figure A7. Debt Service, 2006–29
(In billions of US\$)



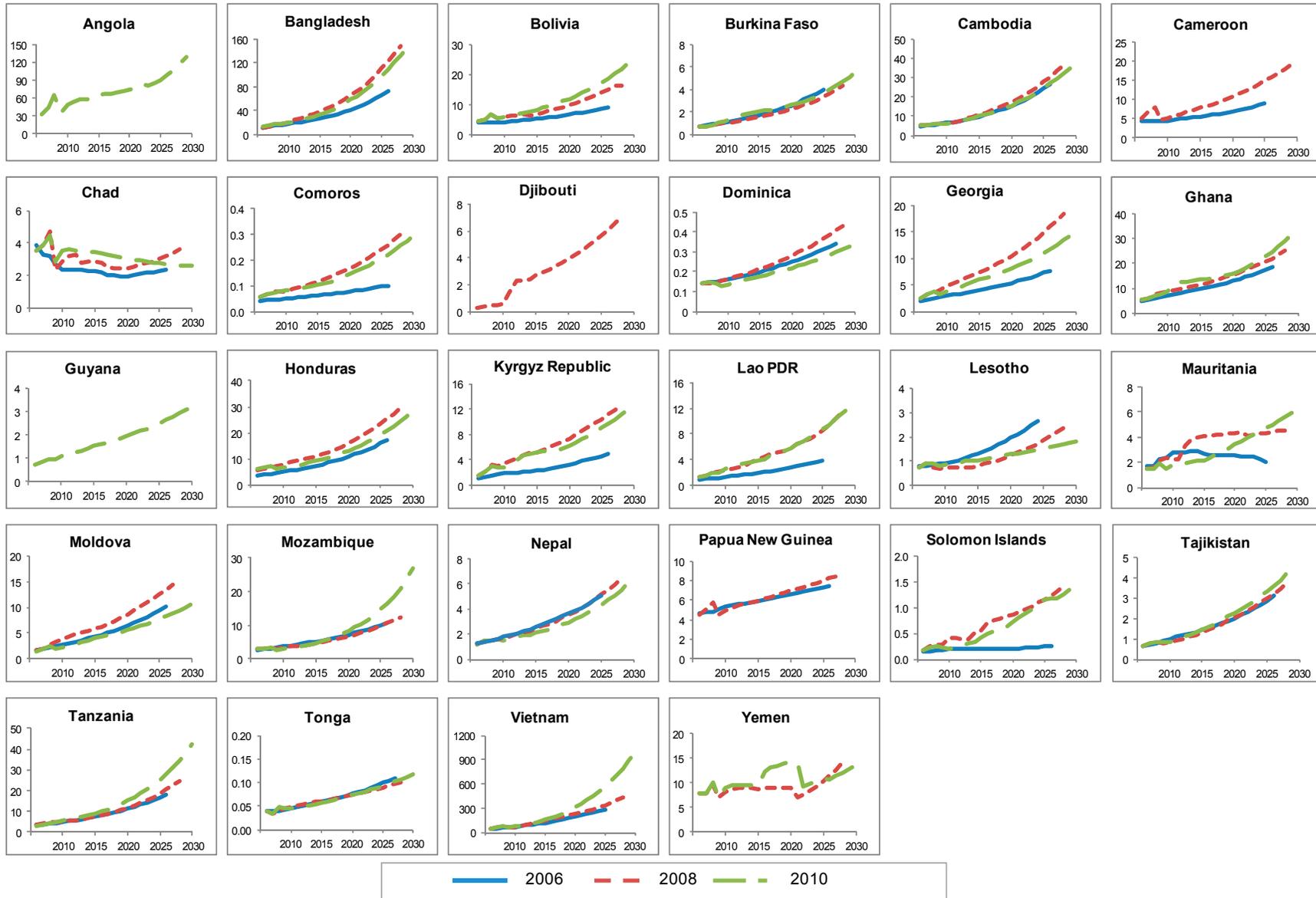
Sources: Country authorities; and staff estimates and projections.

Figure A8. Nominal GDP, 2006–29
(In billions of US\$)



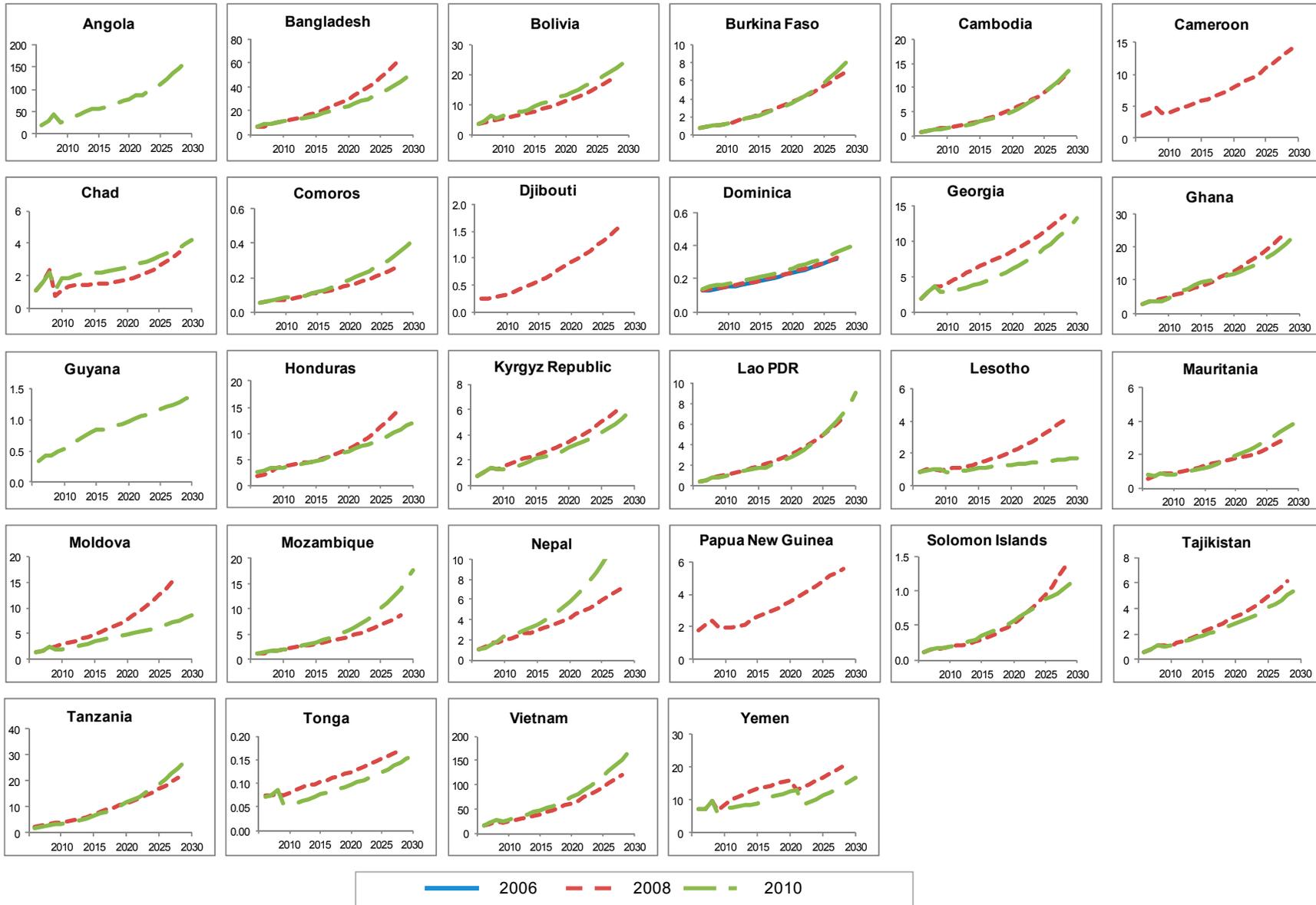
Sources: Country authorities; and staff estimates and projections.

Figure A9. Exports of Goods and Services, 2006–29
(In billions of US\$)



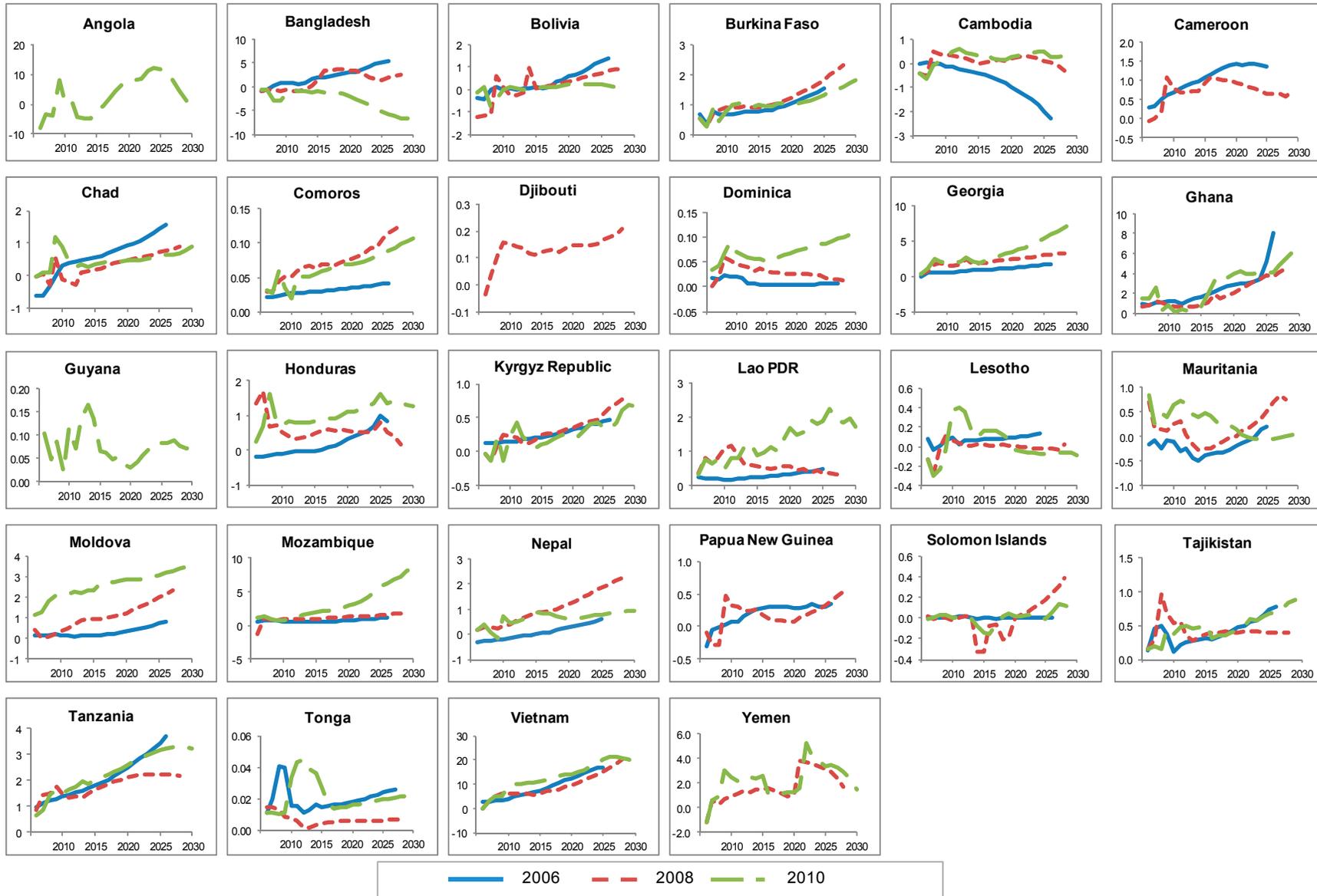
Sources: Country authorities; and staff estimates and projections.

Figure A10. Government Revenue, 2006–29
(in billions of US\$)



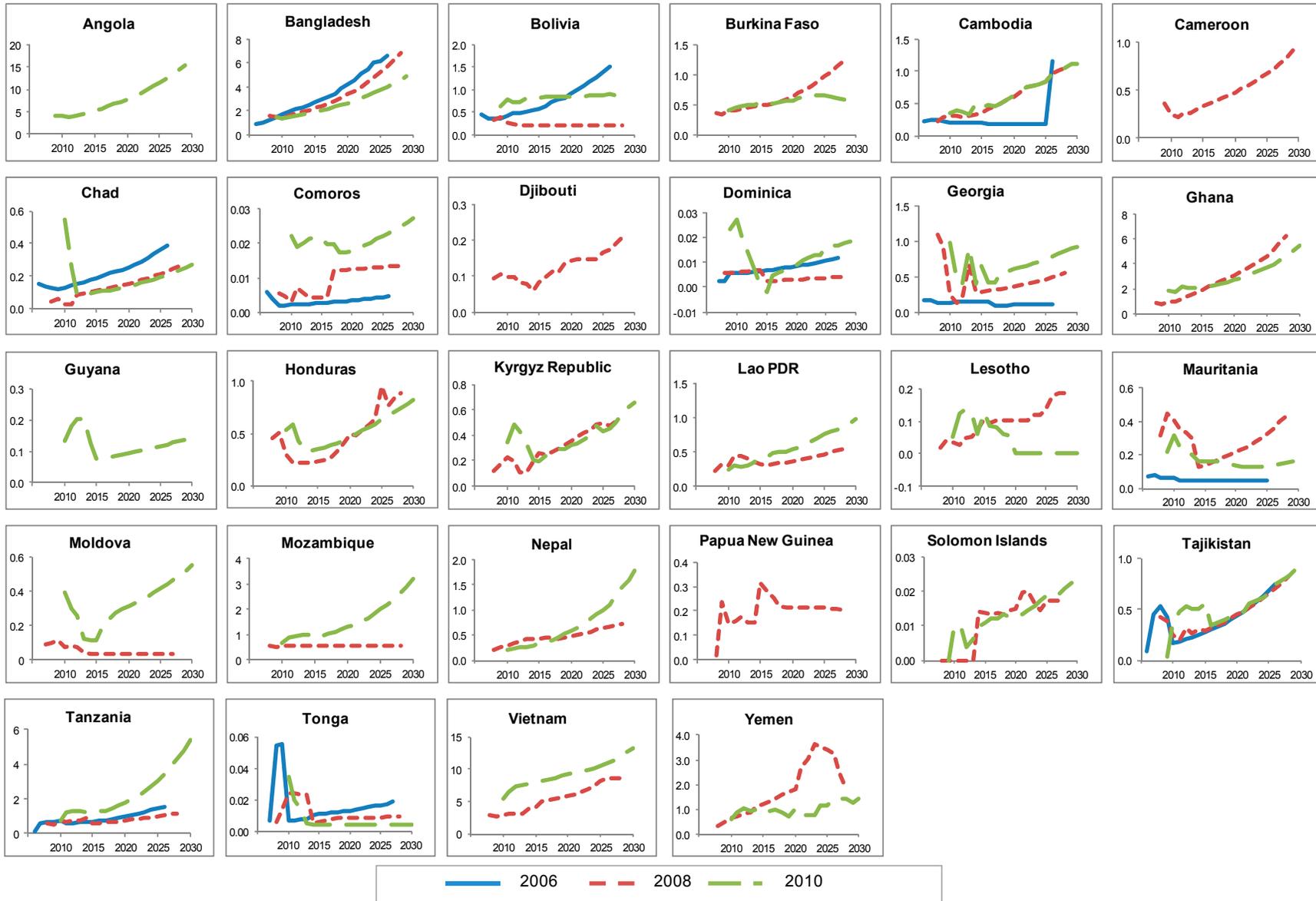
Sources: Country authorities; and staff estimates and projections.

Figure A11. Financing Needs, 2006–29
(In billions of US\$)



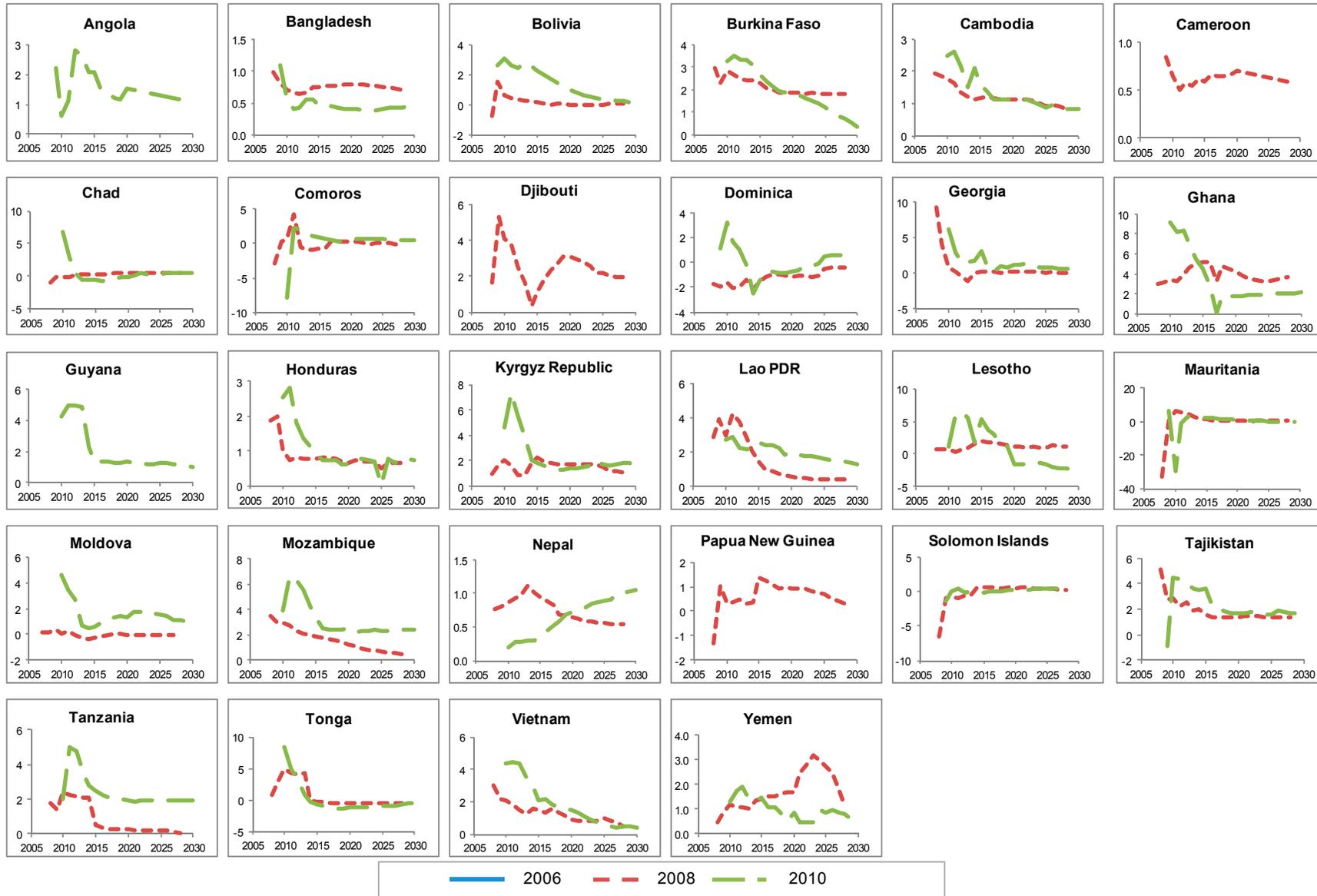
Sources: Country authorities; and staff estimates and projections.

Figure A12. New Medium and Long Term Disbursements, 2006–29
(In billions of US\$)



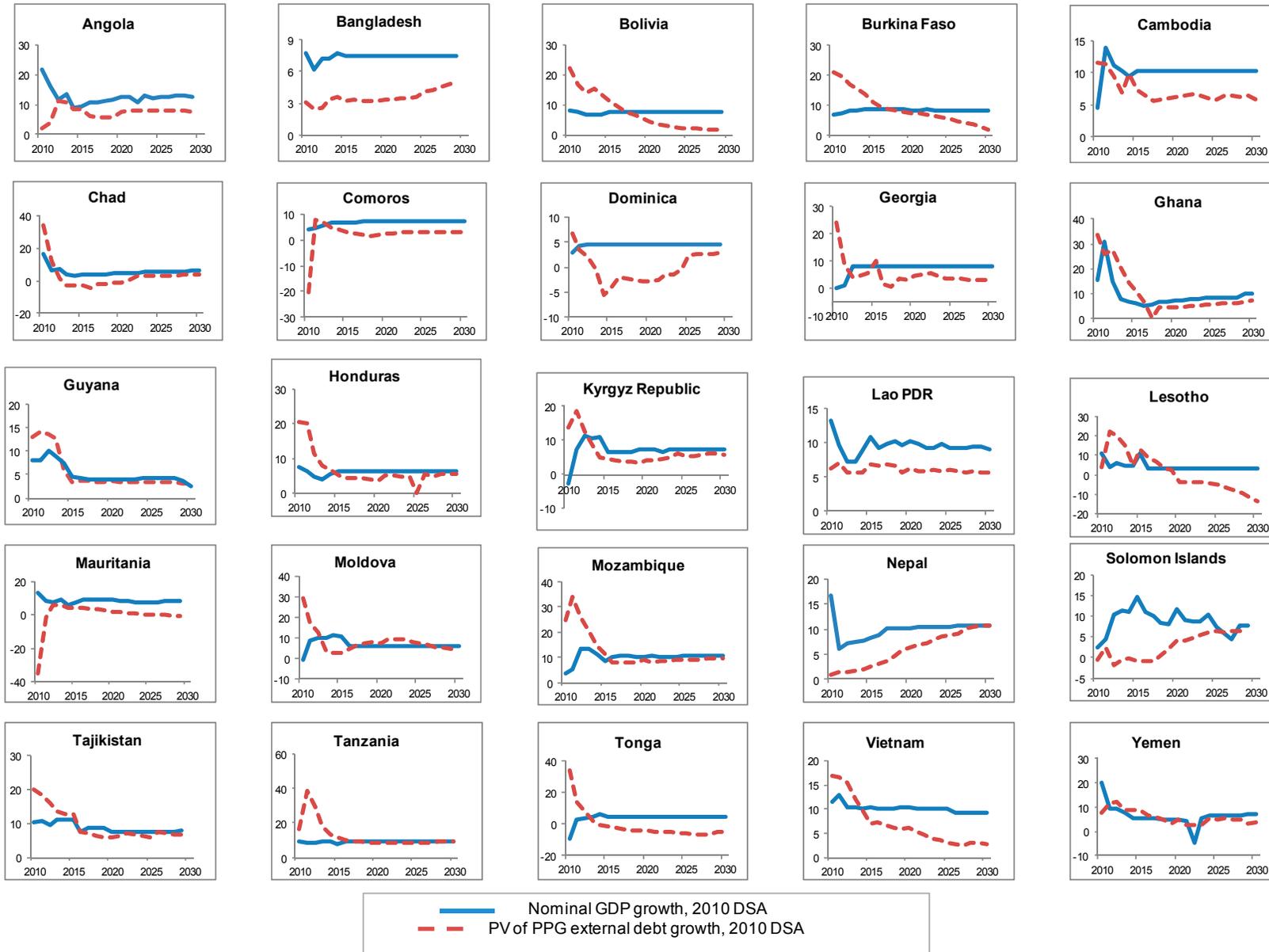
Sources: Country authorities; and staff estimates and projections.

Figure A13. Debt Accumulation Rate, 2006–29
(In percent)



Sources: Country authorities; and staff estimates and projections.

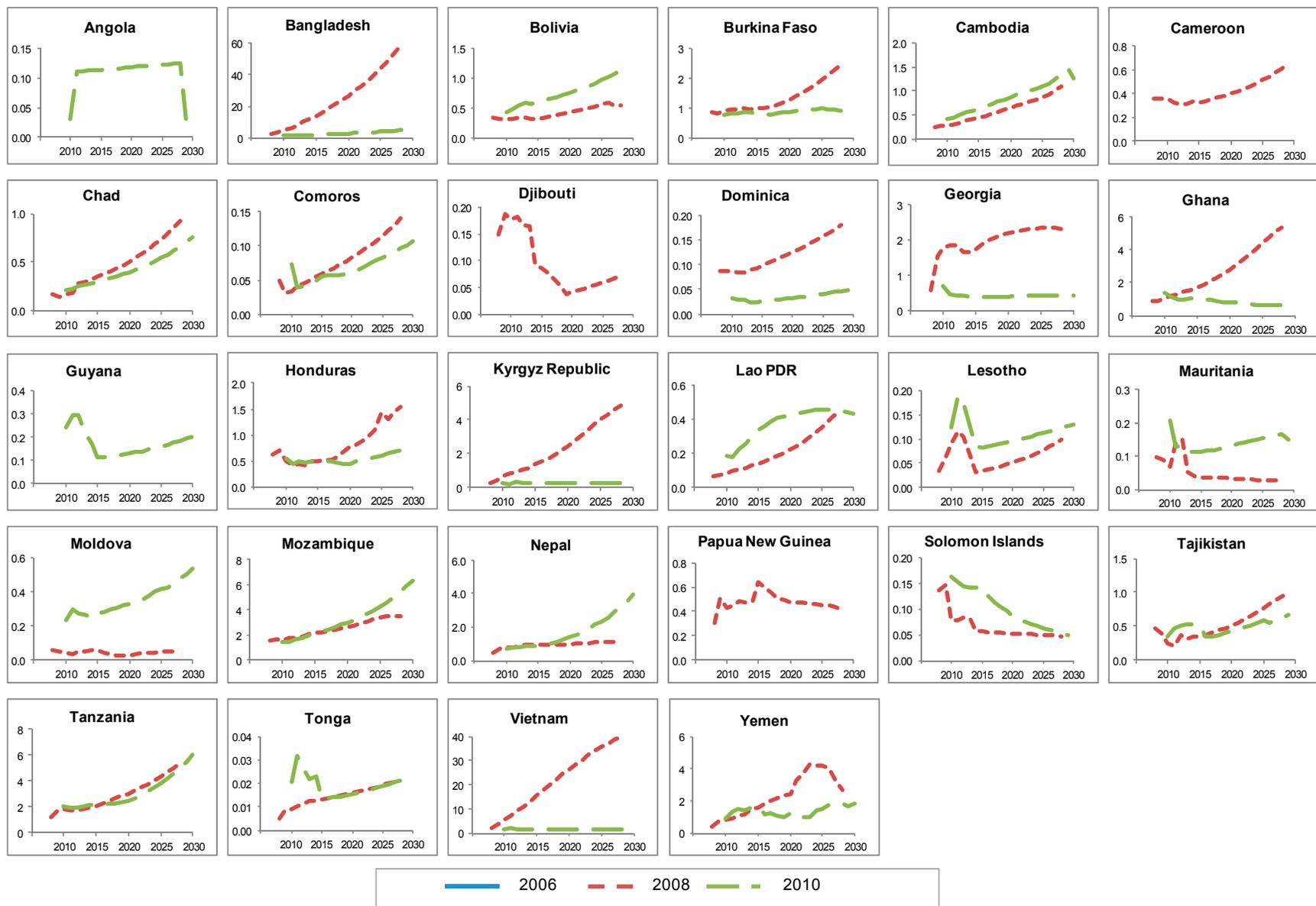
Figure A14. Nominal Debt and Nominal GDP Growth, 2010–29¹
(In percent, 2010 DSAs)



Sources: Country authorities; and staff estimates and projections.

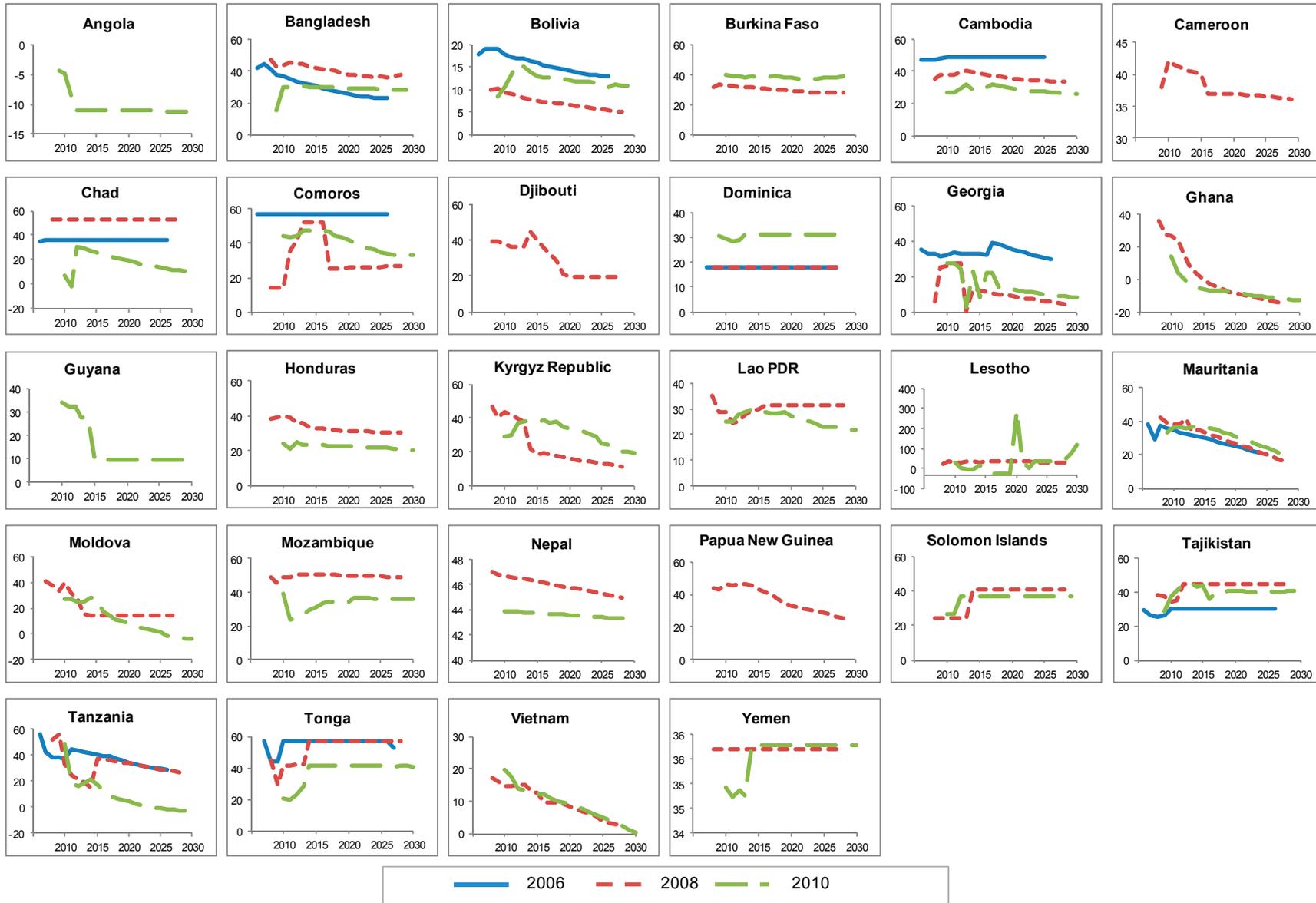
¹Excludes countries, for which 2010 DSAs were not published.

Figure A15. Aid flow, 2006–29
(In billions of US\$)



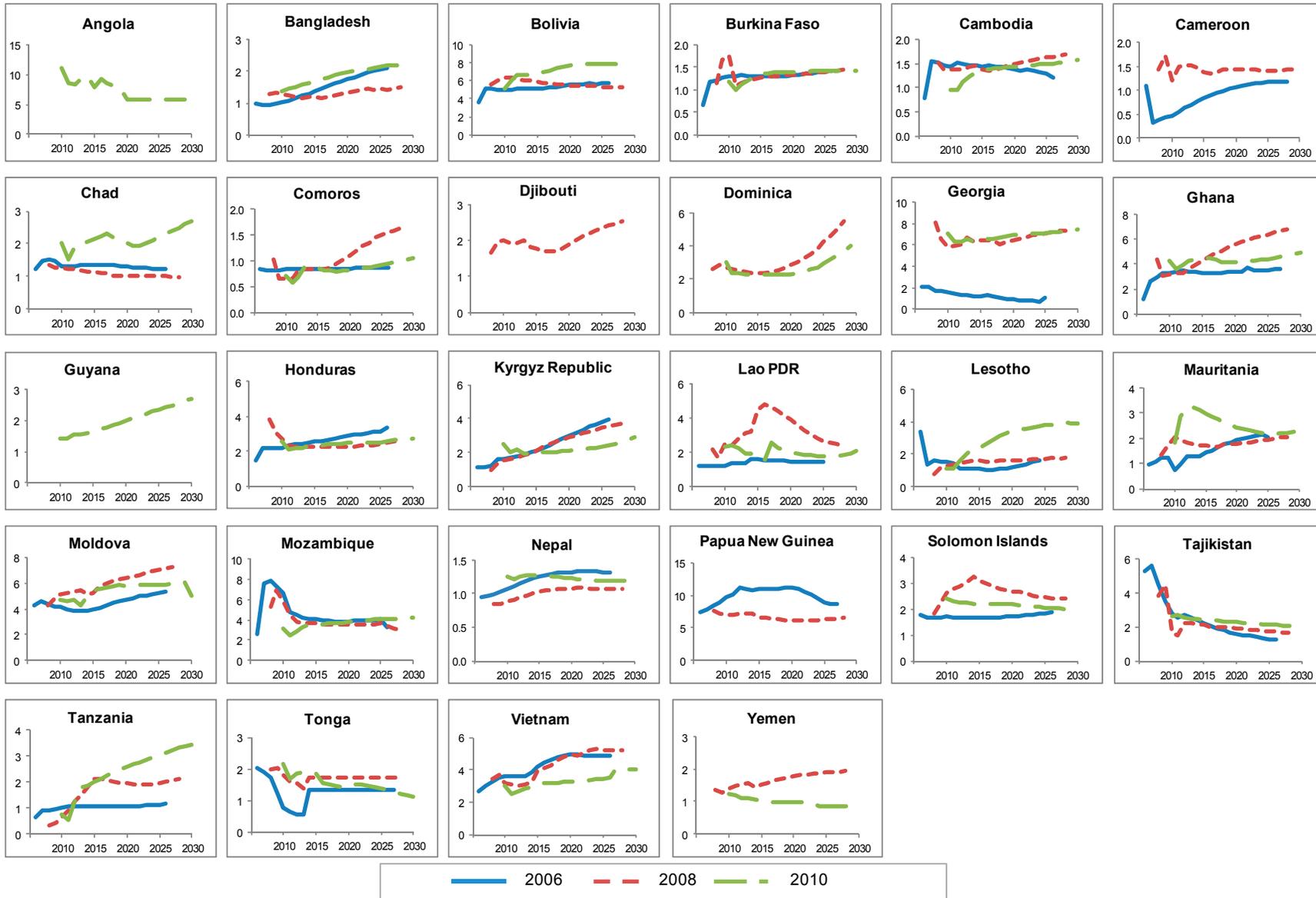
Sources: Country authorities; and staff estimates and projections.

Figure A16. Grant Element in New Disbursements, 2006–29
(In percent)



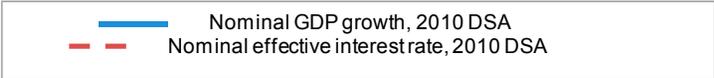
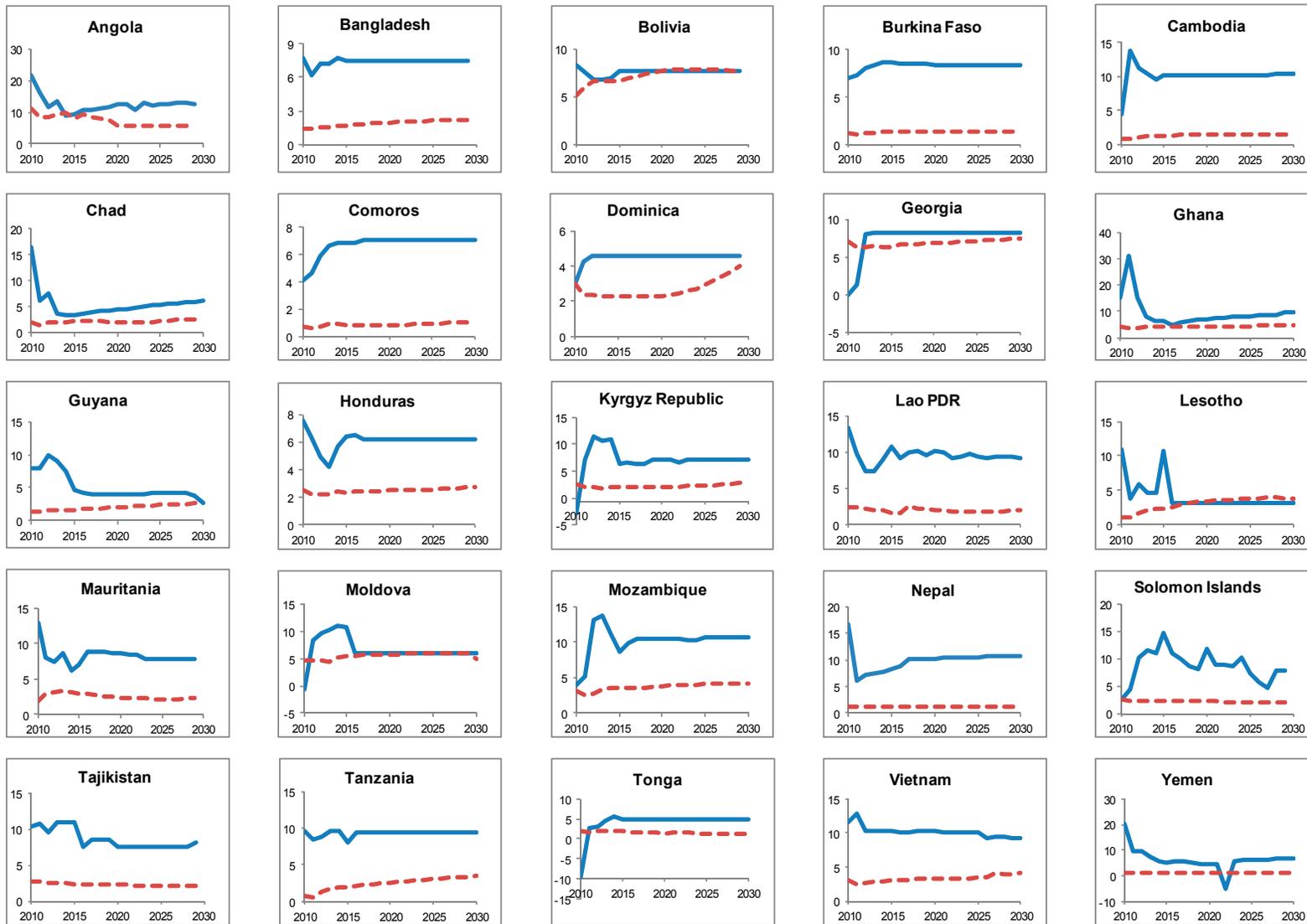
Sources: Country authorities; and staff estimates and projections.

Figure A17. Nominal Effective Interest Rate, 2006–29
(In percent)



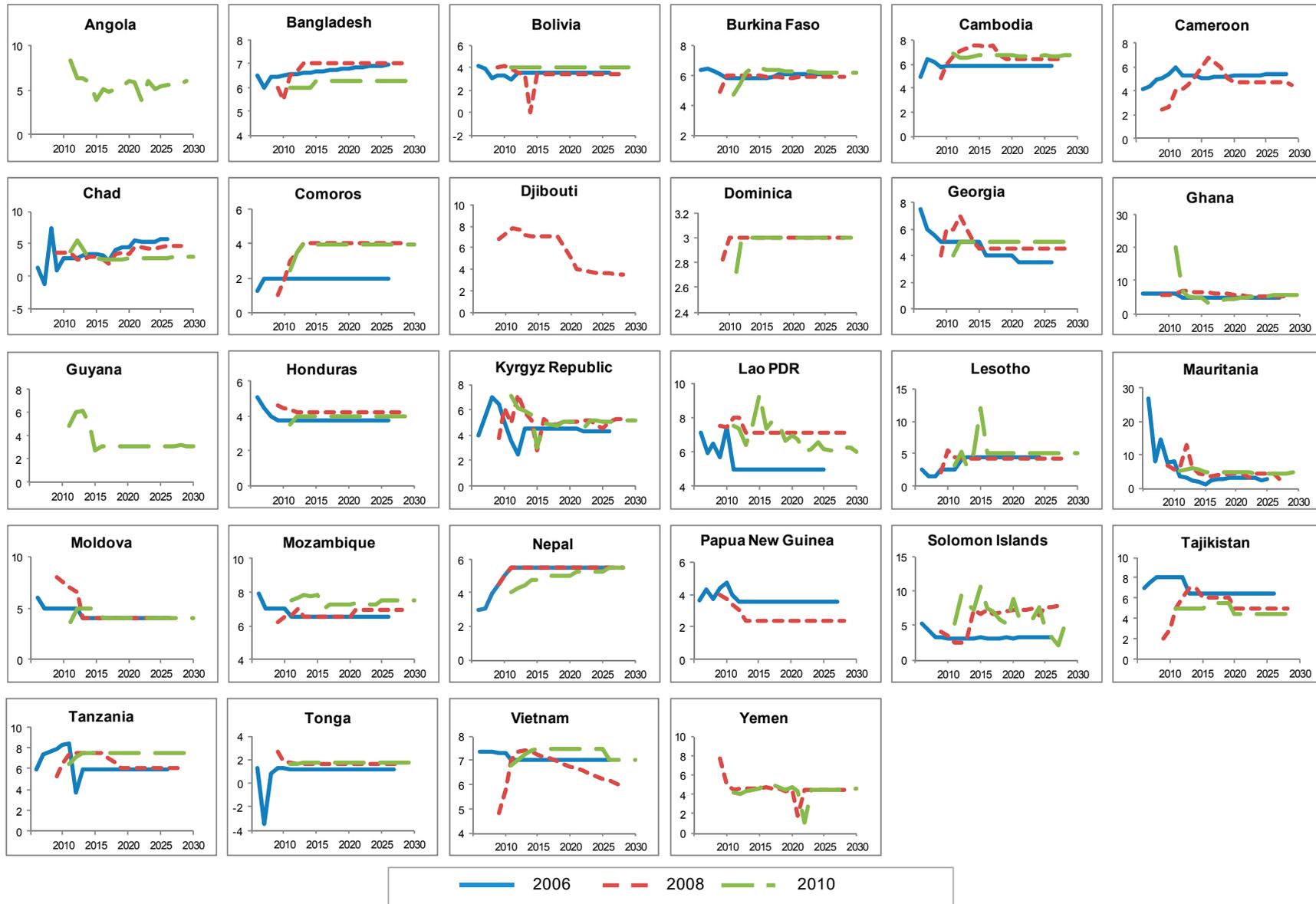
Sources: Country authorities; and staff estimates and projections.

Figure A18. Nominal GDP Growth and Nominal Effective Interest Rate, 2010–29¹
(In percent, 2010 DSAs)



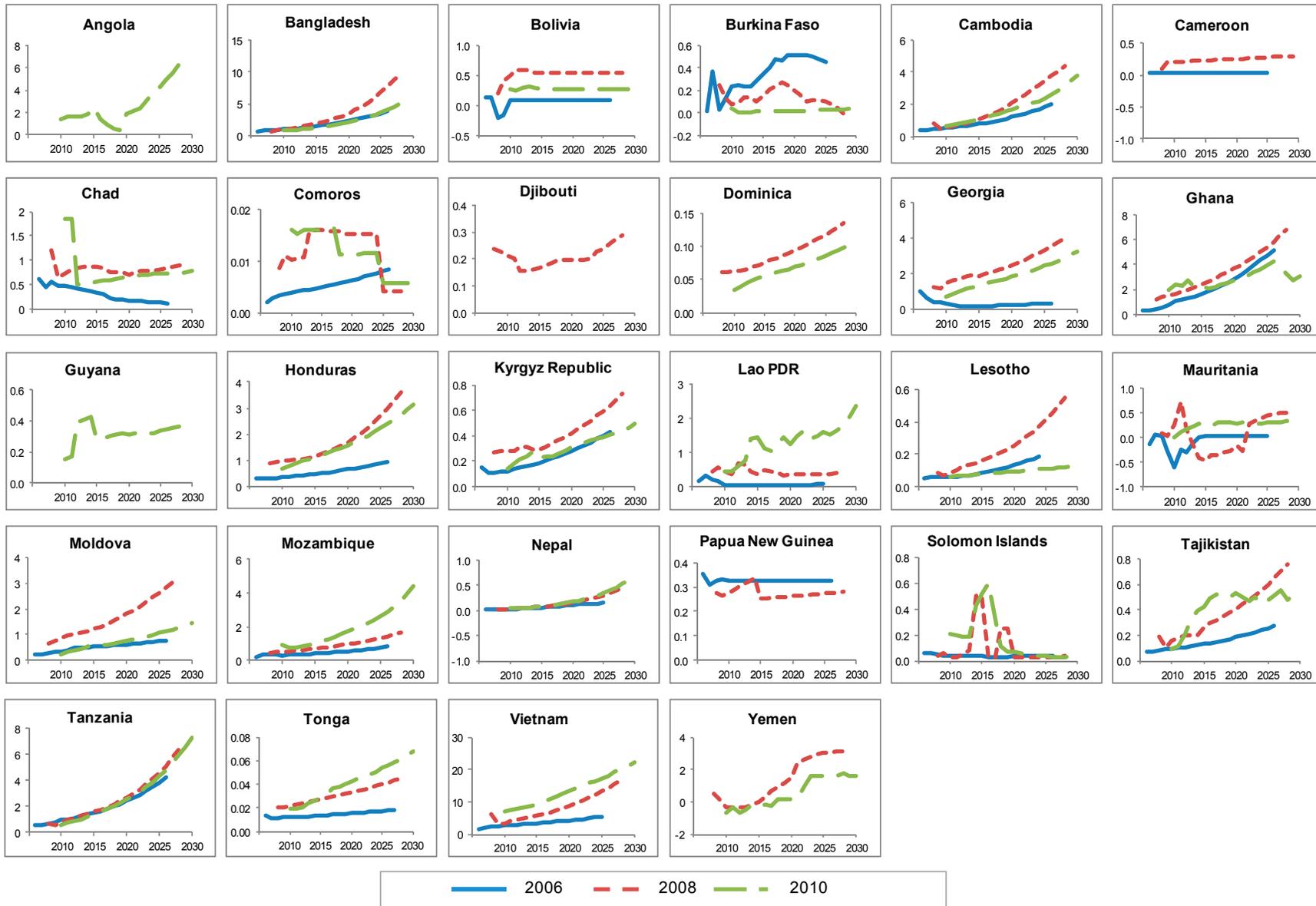
Sources: Country authorities; and staff estimates and projections.
¹Excludes countries, for which 2010 DSAs were not published.

Figure A19. Real GDP Growth, 2006–29
(In percent)



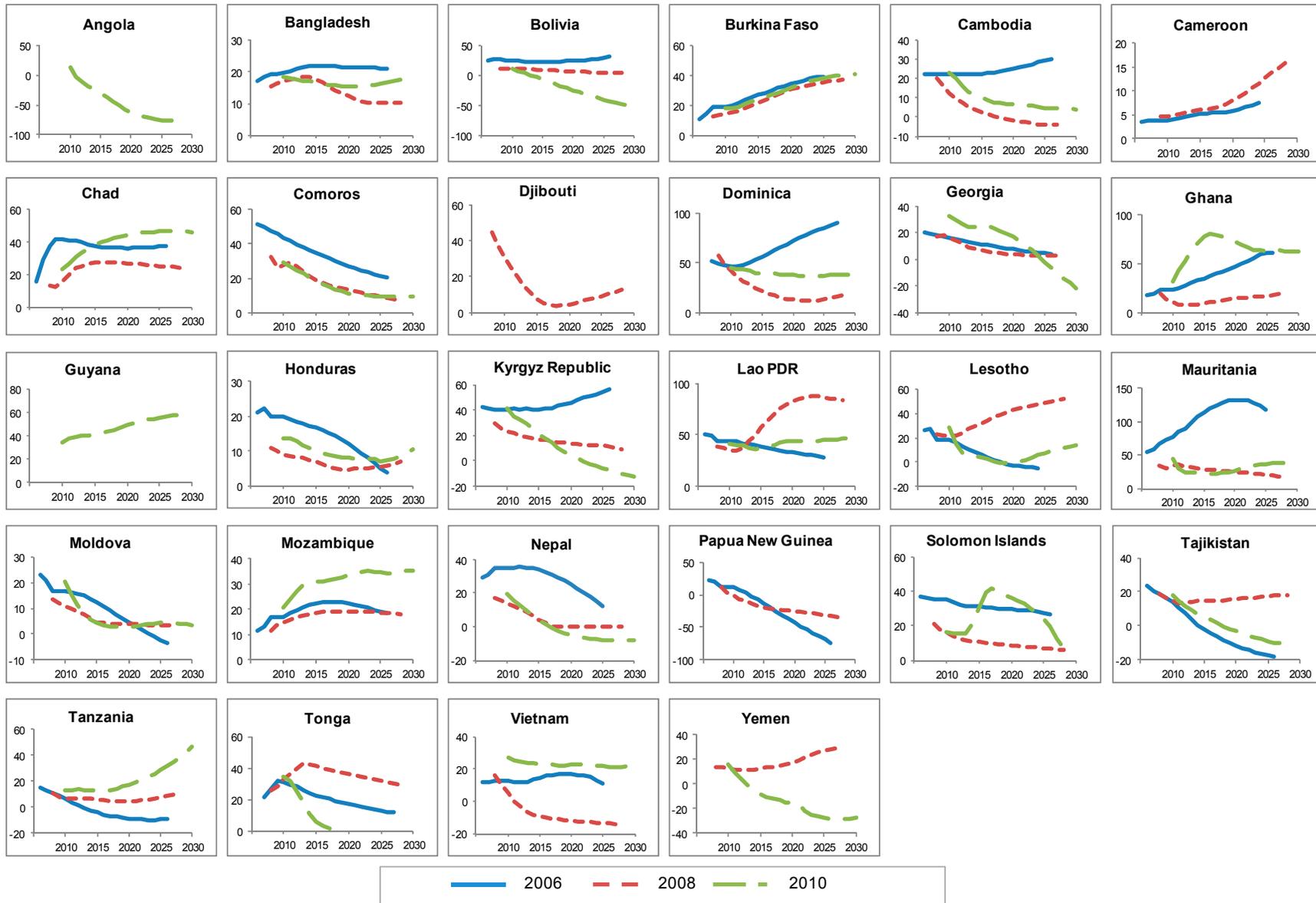
Sources: Country authorities; and staff estimates and projections.

Figure A20. Foreign Direct Investment (FDI), 2006–29
(In billions of US\$)



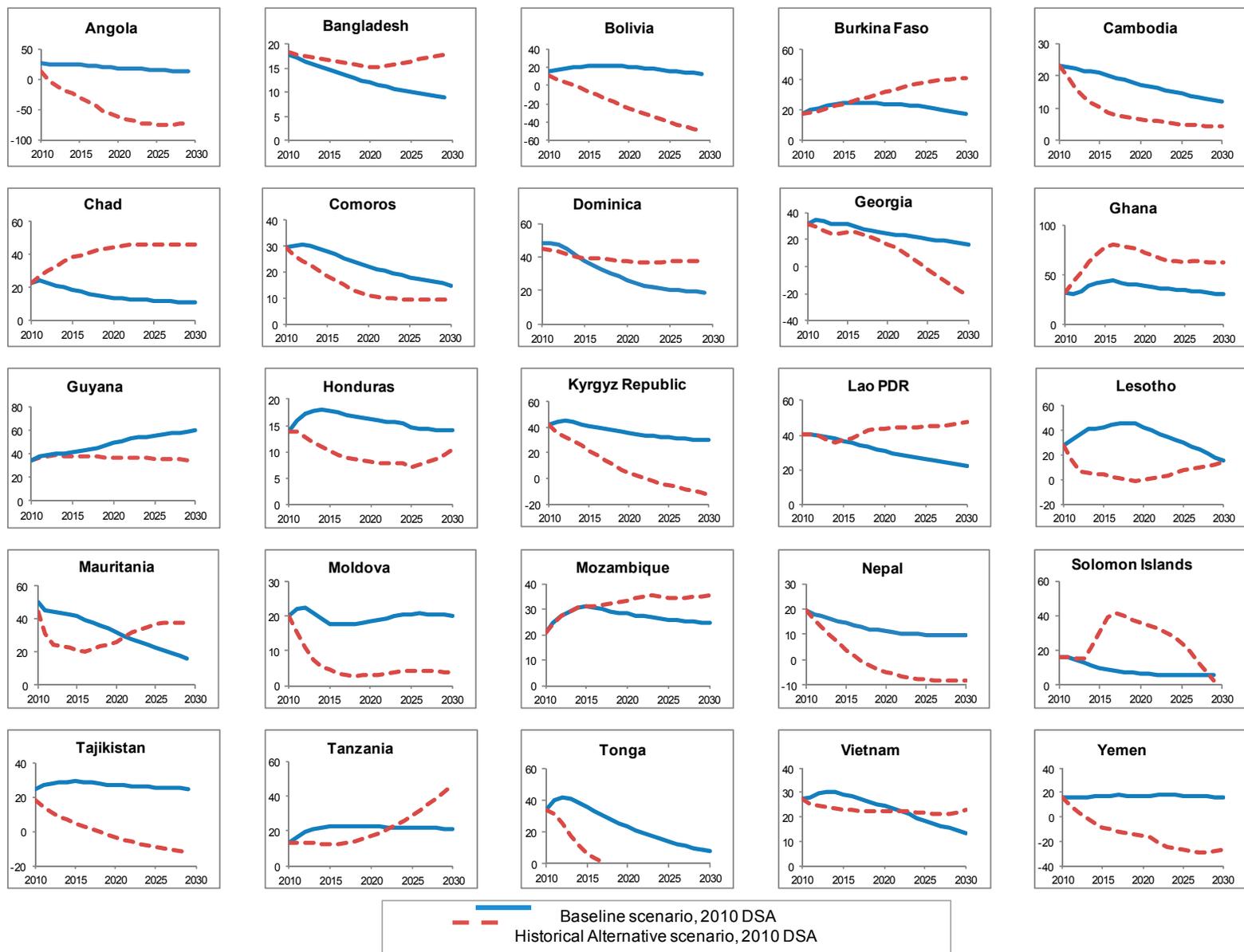
Sources: Country authorities; and staff estimates and projections.

Figure A21. PV of Debt-to-GDP Ratio under Historical Alternative Scenario, 2006–29
(In percent)



Sources: Country authorities; and staff estimates and projections.

Figure A22. PV of Debt-to-GDP Ratio: Baseline vs. Historical Alternative Scenario, 2010–29¹
(In percent, 2010 DSA)



Sources: Country authorities; and staff estimates and projections.

¹Excludes countries, for which 2010 DSAs were not published.