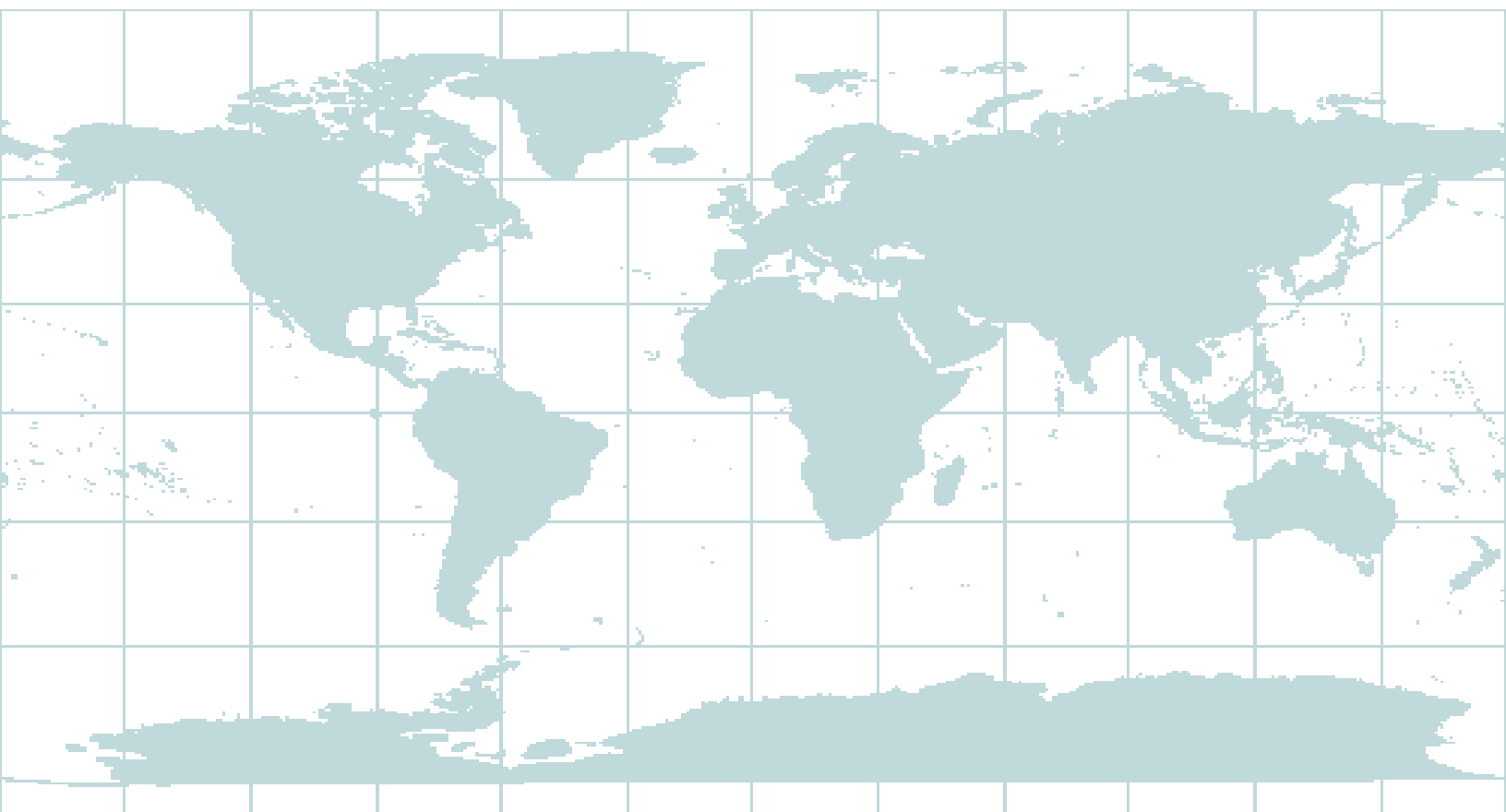


Global Policy Model: An application

Public and private investment in a low-carbon, high growth policy scenario for the world economy



Box IV.4

Crowding in of private investments in a low-emissions, high-growth development path

As demonstrated by the analysis provided in chapter I, simple continuation of past growth patterns would fail to generate sustained high growth for developing countries and would also fail to generate the energy saving and emission reduction needed to avert potentially catastrophic consequences for the world as a whole. To effect a change in course towards a low-emissions, catch-up development pathway, high, upfront public investments are needed. A big push of public investment, along with other measures, is expected to “crowd in” the private investments that are also needed to achieve the desired structural change. However, as the mobilization of large amounts of public resources would be needed, it could well be that the measures would induce some private investors to direct their spending towards the greening of the economy, while discouraging others from investing, inasmuch as interest rates might rise and available savings in financial markets might be “crowded out” by public sector demand for such resources. The prospect of possibly substantial increases in public debts could further erode private investor confidence in respect of making long-term investments.

Existing global models used for the economic analysis of climate change typically do not capture these financial dimensions. The greatest difficulty lies in modelling investment and financial behaviour adequately in a context of great uncertainty and over long periods of time, as required by climate change analysis. The United Nations Global Policy Model (GPM) has been designed to analyse global macroeconomic interactions, but inasmuch as it encompasses the global production and use of different sources of energy, it contains the elements needed to analyse the global financial implications of a big energy and technology push aimed at addressing climate change. The Global Policy Model considers the channels through which a public investment push could crowd in private investment (namely, growth and targeted incentives) and crowd out private resources (namely, interest rates and changes in market confidence and expectations along with shifts in levels of public debt, inflation, the value of private assets and other financial variables).

The figure shows the results of simulations with the Global Policy Model in a scenario with three types of policy adjustment: (a) one where countries worldwide are assumed to increase public spending levels by between 1 and 5 per cent of GDP;^a (b) one where high-emission energy demand is constrained (reflecting, for instance, a cap-and-trade mechanism) to yield lower emissions and greater energy efficiency;^b and (c) one where economic resilience of developing countries is strengthened by providing them, especially the poorest countries, with full and duty-free market access to developed-country markets, leading to greater economic diversification.^c

The policy changes would yield faster growth (2.5 per cent per year in developed countries and 6 per cent per year in developing countries), allowing for growth in private incomes and consumption spending and promoting private investments. By the model's parameter estimates,^d these positive effects of the public investment-led strategy towards achieving low-emissions economies outweigh the crowding out effects through the financial channels. By 2030, the level of private investment would be 1-4 per cent higher than in the business-as-usual scenario. The crowding-in effect would be stronger in the least developed countries, where the fiscal stimuli are greater. Rising private incomes would also help increase the tax base, but not enough to prevent public debt ratios from increasing to relatively high levels. Over the longer run, public indebtedness would stabilize in the developed countries, but at levels of over 100 per cent of gross domestic product (GDP) (see the three right-hand graphs), which many Governments may consider too high for comfort. By 2030, public indebtedness in developing countries would also have risen significantly (by 26 percentage points of GDP over the baseline scenario). In virtue of the assumed international coordination of these strategies, the model suggests that, even at these levels of public indebtedness, continued economic growth, energy saving and trade impulses would continue to crowd in private investment. Nonetheless, public debts cannot rise infinitely. Complementary measures will need to be considered to prevent public indebtedness from becoming explosive. For developed countries, these would need to be sought in the form of new taxes (such as a carbon tax), while developing countries might utilize both fiscal measures and alternative non-debt creating financing support (for example, through a foreign direct investment stimulus in some cases or foreign aid in the case of the poorest countries). The various financing options are discussed further in chapter VI.

a In the model, aggregate public expenditures are adjusted, but—in conjunction with the second policy component—these may be seen to have been allocated for achieving greater energy efficiency and low-emissions energy production in the developed countries and for a combination of public investment projects for low-emissions energy, adaptation and general developmental infrastructure in the developing countries. The size of the fiscal stimulus varies by needs, with greater spending increases for the poorer countries, especially the least developed countries, which have greater infrastructural deficits and adaptation needs.

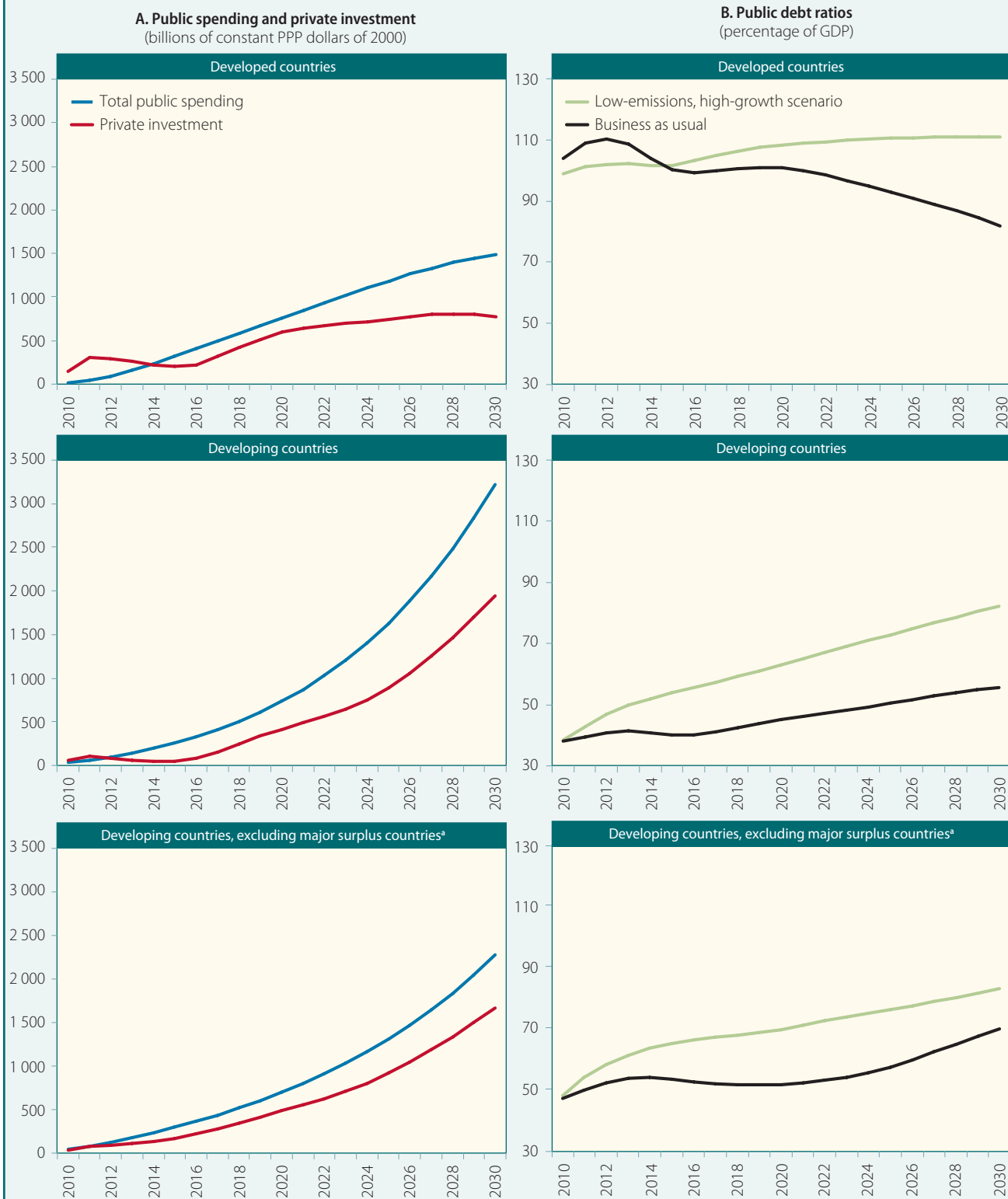
b The constraint is set to induce a reduction in the use of fossil-fuel energy by at least 4 per cent per year.

c The first policy component (public investments in infrastructure, energy and human capital) is also expected to support trading capacity and economic diversification. In addition, greater commodity price stability would support long-term investments towards diversification. In the model, this is achieved by triggering supply and demand adjustments under international trade agreements.

d Please note that all behavioural relations of the model were estimated econometrically, yielding robust and plausible parameter values (see Cripps, Izurieta and Vos (forthcoming)).

Box IV.4 (cont'd)

Public spending, private investment and public indebtedness in a low-emissions, high-growth scenario, developed and developing countries, 2010-2030



Source: UN/DESA, based on simulations with the United Nations Global Policy Model.

^a Namely, China, major oil exporters in Western Asia, and newly industrialized countries of East Asia.