GLOBAL IMBALANCES, UNDER-CONSUMPTION AND OVER-BORROWING: THE STATE OF THE WORLD ECONOMY AND FUTURE POLICIES

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Abstract

This paper addresses the question of whether growth convergence can be sustained in the global economy without compromising welfare and without causing major crises. It employs a simplified stock-flow analytical framework to examine the proposition that the pace and pattern of global growth is conditioned by 'under-consumption' in some regions of the world and 'over-borrowing' in other regions. A baseline projection using the Cambridge-Alphametrics model (CAM) illustrates consequences of resumed global imbalances after the 2008-2009 crisis. An alternative scenario exemplifies the case in which China and India shift towards internal income redistribution and domestic demand orientated policies and suggests that this will not be sufficient to correct global imbalances or induce improved growth rates in other developing regions. Finally a more ambitious development perspective is simulated. Such a scenario requires internationally-coordinated policy efforts, with greater role for governments in the management of demand, income distribution and environmental sustainability, as well as measures to reduce instability of exchange rate and commodity markets.

JEL codes: E2, F1, F3, G1, N2, O16

Keywords: Global economic imbalances, under-consumption and over-borrowing, income distribution, internationally-coordinated policies.

1. Introduction

This paper seeks to shed some light onto the central question of our times, namely whether, given the state of the world economy, growth convergence can be achieved without compromising welfare and without causing global economic crises with the potential to wipe out advancements in the desired direction. More specifically, the analysis here focuses on the structure of global demand and the underlying process of accumulation. The central proposition is that as global growth is preconditioned on 'under-consumption' in some regions of the world and 'over-borrowing' in other regions, global imbalances will continue to emerge, crises will unravel, and thus neither welfare nor sustained growth can result. Against this background, a set of alternative scenarios requiring pro-active policies are discussed and their outcomes, simulated with a global macro-econometric model, are compared.

The acute reader may have immediately noticed that the approach may be too narrow to be taken at face value, since fundamental issues of supply constraints may be left unresolved. Indeed, this article is a sequel to Izurieta and Singh (2010), in which the question of whether, if India and China expand their economies at their desired and recently achieved rates of growth of 9 per cent per annum and 11 per cent per annum respectively, there is room for the US economy to expand at its full employment rate of 3 per cent per annum. The analysis included simulation scenarios using the Cambridge-Alphametrics Model (CAM) of the world economy, the same tool used in this article, succinctly described again below. Although the model is primordially demand-orientated in the sense that it seeks to identify demand-side constraints on world economic growth, it deals with supply in fundamental ways as explained in the earlier paper. Thus, Izurieta and Singh (2010) addressed specifically the issue that, left to the operation of free markets and current patterns of production, supply-side constraints will be binding and the postulated growth rates for the three countries may turn out to be incompatible. Such growth rates would lead, over time, to huge energy, raw materials and food shortages, commodity prices would sky-rocket and the growth path would become unsustainable.

It was argued in that paper that the three objectives — growth in India, China and the United States — were each quite reasonable and socially sensible in themselves. US growth is required for full employment in that country and fast growth in India and China are needed to reduce the very large numbers employed in traditional low productivity activities. Much of this labour force needs to be transferred to higher productivity, modern manufacturing and service sectors. The paper concluded that growth goals in the three countries

could be made compatible provided there was cooperation between them, with emphasis on technological progress and industrial policy. Particularly useful in this context would be technical progress in India and China on energy saving, more economic use of raw materials and greater food production. The main message of the paper was that cooperation and policy coordination are an imperative as much for the US, even though it is a technical leader, as for India and China.

The present contribution is concerned with the same basic issue of possible North–South contention but concentrates on a rather different set of analytical questions and presumptions. First it examines the question of world financial imbalances and their implications for achieving desired economic growth in the three countries, which may be regarded as surrogates for North–South interactions in the twenty-first century. Opinions differ on this subject. Many support the view that global imbalances were a primary cause of the current world economic slowdown. Others, however, suggest that since the dollar did not collapse and the foreign exchange markets remained relatively calm such imbalances cannot be regarded as a major cause of the recession. As will become clearer below, the potential for global imbalances is intrinsic to the underlying global growth process in the current state of the global economy and such potential remains a tangible threat unless addressed head-on.

This article also explores another issue that has generally been ignored in the literature, with notable exceptions (such as Akyuz, 2009, 2010a, and Patnaik, 2008, 2010). At one level the argument is very simple. There has been rising income inequality around the world, including in China, India and the US. This is attributed partly to the fact that under globalization the balance of power has shifted decisively from labour to capital, mainly because capital is highly mobile and labour is highly immobile. This in turn has led to a rising share of profits in national income in many countries and has been accompanied by workers' real wages falling behind growth of productivity. The final result, at a global level, is a shortfall in the level of consumption expenditure and reliance on rapid expansion of trade, investment and government spending to maintain the momentum of economic growth.[1]

These and other variants of the under-consumption thesis are examined in the light of stock-flow modelling of savings and investments in developed and developing countries and are quantified in the last section of this article through a new set of simulation studies that relate demand policies and growth rates in the US, China, India and the rest of the world, and examine potential impacts across regions. Of particular interest is a case in which only the two major

countries in the developing world, China and India, shift towards income distribution and domestic demand orientated policies in trying to achieve sustained growth, but in so doing do not make a meaningful contribution to correct global imbalances or trigger growth elsewhere in the developing world. Thus, a more ambitious, yet economically plausible scenario is simulated, in which a congenial combination of public policy and technology changes brings about a desired outcome for the world as a whole. The analysis emphasizes the merits of coordination and cooperation between nation states through short-term pacts to deal with individual issues within a market-determined global environment.

2. Global Imbalances and Explanations of The Current Recession

During the years prior to the world recession of 2009, the build-up of global financial imbalances, specifically the huge deficit of the US, was seen as a major threat to economic stability. The lack of agreement about the central causes of such imbalances is apparent in a variety of studies,[2] yet, despite the diversity of explanations, most studies argued that 'what cannot continue forever must one day stop'. It was feared that the drastic unwinding of imbalances might take the form of a slowdown of world growth or a 'free-fall of the dollar'. Policy prescriptions to avert the catastrophe were as varied as the alleged causes of the imbalances, and included coordinated exchange rate realignment, monetary and fiscal expansion in surplus countries, fiscal contraction in the US and other deficit countries and monetary policy targeted at asset price inflation.

In the event, instead of a slowdown of growth or free-fall of the dollar, there was a meltdown of US and European financial systems, a collapse of global stock markets and a sharp recession of a magnitude unseen since the Great Depression. Attention focused on the meltdown, explained by the proliferation of credit derivatives and the US sub-prime mortgage crisis. Furthermore, the recession reduced global imbalances to the extent that to many the imbalances appear to be a problem of the past.

Our central thesis is that the recession did not result primarily from a proliferation of 'bad mortgages' or lack of oversight in the financial markets,[3] but from structural inequalities in global demand and income. Imbalances may be expected to return again unless new mechanisms are adopted to coordinate national policies, a development that remains something to wish for rather than an item on the mainstream political agenda. Two contrasting patterns of

behaviour generate ongoing financial imbalances in the globalized economy, which could be explained by two complementary theses. On the one hand, international competition organized by global capital with labour forces and governments in different countries as the chess pieces intensifies the risk of 'under-consumption' by depressing wages, eroding working conditions, reducing budgets and limiting social protection. This process has been happening in high-, middle- and low-income countries alike, feeding a groundswell of protest against ill-effects of globalization. It tends to generate surpluses in the most competitive countries where profits and wealth are highly concentrated.
On the other hand, the liquidity of the world financial system and the search for maximum returns by an expanding class of global investors has given rise to incautious lending and 'over-borrowing' in many emerging markets and higher-income countries.

3. The Under-Consumption Thesis

Patnaik (2010) advances the under-consumption argument by comparing patterns of production and consumption in India and China with those of the US and other high income countries, observing that the growth of global imbalances to unprecedented levels before the crisis followed a process of 'diffusion of activities' (mainly, manufacturing and services) from 'core' countries, led by the US, to the 'periphery', notably China and India. The diffusion of activities from the core to the periphery is consistent with strategies of export orientation in the latter and cost reduction (by outsourcing) in the former. The export-led strategy, by increasing production and investment (both in the 'modern' sectors as well as in the commodity sectors integrated with them) resulted in increases of national income, which in the case of China has hovered around 10 per cent per year for many years, and in India has more recently accelerated to around 8 per cent per year. But wages in peripheral countries do not keep pace with rapid growth of productivity in the new industries. Therefore consumption does not increase at the speed of income, which translates into a tendency towards under-consumption in the country as a whole. Unless this tendency is compensated by ever-increasing investment or government deficits, the end result is a rising current account surplus *vis-à-vis* the rest of the world.[4]

Patnaik further suggests that the high profit rate in the periphery implies pressure to increase profit rates elsewhere and thus contain wages in the modern sector of the world as a whole. Moreover the continuing shift of activities from

the core to the periphery leads to a slowdown in employment creation and growth of gross domestic product (GDP) in core countries, increasing the pressure for wage repression and cost saving.[5] Singh and Zammit (forthcoming, 2011 corroborate this thesis:

> Under globalization, the power of workers in most advanced countries has been sharply reduced while that of capital has increased due largely to the free movement of capital. As real wage growth would be increasingly lower than notional productivity growth for the world as a whole, the process threatens to result in global under-consumption which, other things equal, will reduce both global growth and employment.

The authors go on to suggest the direction for policy action. 'A more equal distribution of income, wealth and social protection, as well as returns to capital and labour, are desirable, not only for their own sake but also to resolve the incipient world under-consumption problem before this becomes a serious obstacle to fast economic growth.' The under-consumption argument is also examined empirically in Onaran (2009), showing long-term patterns of real-wage income in a number of developed and developing countries. Many other studies have shown how income distribution patterns either worsened or remained disappointing during the build-up of global imbalances. [6]

4. Sustained Deficits and Over-Borrowing

A pause is required at this point as the general tendency towards under-consumption and a rising profit share does not seem to have led to a tendency towards rising surpluses in core countries other than Germany and Japan. Evidently surpluses cannot be achieved in all countries at the same time. Nevertheless large and increasing current account deficits generated in the US, the UK and a few other developed countries require further explanation. Another reflection with regard to the global under-consumption thesis is that, until the global economic crisis, world income had been growing rapidly and global employment had been rising (ILO, 2010). Although growth in some core countries (Japan and some parts of Europe) had been disappointing, income and employment had been on the rise in the countries that incurred deficits. Thus, we need to square the 'under-consumption' thesis for the world as a whole with the facts that world income and employment were growing in the years prior to the crisis and that the US and some other countries were fuelling world demand by spending more than they earned.

Stagnation of real wages in the US, due to the process of profit inflation / wage repression noted above, did not need to lead to under-consumption in the aggregate. One important reason for this was 'over-borrowing' in a context of cheap credit and rising real estate valuations. Holding gains allowed households to spend more without reducing their wealth. Moreover it appears that, for the US as a whole, external assets (investments in other countries) increased in value much faster than liabilities, generating holding gains that enriched US investors and partially compensated for current account deficits.[7] Finally the US government contributed to the current account deficit and stimulus to world demand by cutting taxes and running sustained budget deficits that were financed by global investors. A similar story can be told for the UK and other core countries that sustained external deficits before the crisis.

It may be asked why similar 'over-borrowing' stimulated by holding gains did not take place to the same extent in export-led countries in the periphery. These countries have certainly experienced rising prices of real estate and business valuations that might have been expected to generate credit booms similar to the one in the US. One explanation for the absence of 'over-borrowing' in the periphery since the late 1990s is that prior episodes in the late 1980s and 1990s had already caused localized crises and overhangs of toxic assets that made governments, monetary authorities and financial institutions in the periphery much more cautious about credit expansion and financial risk. Another explanation may be that the substantial role of the state as landowner and investor in state enterprises and the high concentration of private wealth meant that holding gains were less important for the population at large.[8]

5. A Theoretical Perspective on Financial Imbalances, Capital And Wealth

To examine the changing pattern of global imbalances and the impact of 'under-consumption' and 'over-borrowing' more systematically, we will first examine accounting relationships and simplified characterizations of behaviour that provide a logical foundation for analysis of global imbalances and growth of income and wealth in a multi-country model of the world as a closed economy. The following sections of this article examine model simulations for major countries and world regions to consider the scale of imbalances and requirements for policy intervention that may emerge in future beyond the present recession.

Conventional accounting relations that link global imbalances with the pattern of income and demand state that, for any country or bloc *j*, the external balance is equal to the difference between income, *Y* and spending, *H*; and this in turn is exactly equal to the net acquisition of financial assets, *NA*: [9]

$$(1) \qquad CA_j \equiv Y_j - H_j \equiv NA_j$$

Since a surplus is by definition matched with a deficit somewhere else, the combined current account for the world as a whole and the combined net acquisition of financial assets sums to zero. From this it follows that fluctuations of world income are exactly matched by fluctuations of world spending:

$$(2) \qquad \begin{aligned} & CA_w \equiv 0 \equiv Y_w - H_w \qquad w = \sum_{world} j \\ \Rightarrow \qquad & Y_w \equiv H_w \end{aligned}$$

At any given time the excess of income over spending in some countries must be matched by under-spending elsewhere and world income is equal to world spending.

To examine the contributions of individual countries to global spending and the pattern of surpluses and deficits it is necessary to make behavioural assumptions about the relationship between income, spending and acquisition of financial assets. Firstly we may note that spending decisions are made in an uncertain environment. They are based on expected, rather than realized, flows of income and the resulting gap between income and spending may be different from the expected or target rate of acquisition of financial assets that different institutions judge to be appropriate. Analytically, extending the notation above, spending in each country level is determined on the basis of objectives for net accumulation of financial assets *NA** and assumptions about expected income Y^e:

$$(3) \qquad H_{j_t} = Y^e_{j_t} - NA^*_{j_t}$$

From (2) and (3) summed over all countries it follows that:

$$(4) \qquad \begin{aligned} & \sum_j H_{j_t} = \sum_j Y^e_{j_t} - \sum_j NA^*_{j_t} \\ \Rightarrow \qquad & Y_{w_t} = \sum_j Y^e_{j_t} - \sum_j NA^*_{j_t} \end{aligned}$$

Or, in other words, realized income in the world as a whole will exceed or fall short of the expected level depending on whether the sum of targets for

financial assets in the world as a whole represents a deficit or a surplus. Thus intended deficits tend to accelerate global growth while intended surpluses tend to retard growth. If all countries try to achieve surpluses at the same time, income will fall until some countries accept ongoing deficits.

In an economy with a limited or controlled credit system the net financial position of households and businesses may be largely driven by liquidity needs with the government creating money and the private sector holding deposits. There is then a close relationship between the government's budget balance and the external balance (current account) as could be observed in the 1950s and 1960s. From the 1970s onwards financial systems in most countries have been liberalized and merged into a global financial system, creating a situation in which the relationship between capital investment, borrowing and financial wealth is more flexible and processes determining the net accumulation of financial assets in each country require further analysis.

To investigate the formation of financial objectives in stock-flow terms,[10] let us introduce the wealth identity (*W*), which comprises both financial (*A*) and physical assets including land (*K*)[11]:

$$W_{j_t} \equiv A_{j_t} + K_{j_t} \tag{5}$$

and assume a wealth target W* and an adjustment process, similar to Godley (1999). Net acquisition of financial assets in the absence of binding credit constraints may then be represented as an attempt to reconcile the wealth objective with the expected value of real capital:

$$\begin{aligned} A^*_{j_t} &= W^*_{j_t} - K^e_{j_t} \\ NA^*_{j_t} &= \rho_j . \left(A^*_{j_t} - A_{j_{t-1}} \right) \end{aligned} \tag{6}$$

Recalling (1) and (3) we obtain an expression for the ex-post acquisition of financial assets:

$$NA_{j_t} = \left(Y_{j_t} - Y^e_{j_t} \right) + NA^*_{j_t} \tag{7}$$

And using (6):

$$NA_{j_t} = \left(Y_{j_t} - Y^e_{j_t} \right) + \rho_j . \left(W^*_{j_t} - K^e_{j_t} - A_{j_{t-1}} \right) \tag{8}$$

Thus the observed net acquisition of financial assets is the outcome of three factors:
i) unanticipated changes in income $Y - Y^e$
ii) the gap between the wealth target W^* and the expected value of real capital K^e
iii) whether the wealth gap (ii) exceeds or falls short of the inherited financial position A_{-1}.

This and other similar models make wealth objectives and the value of real capital the long-run drivers of financial positions (see, for example, Izurieta, 2005). By analogy with savings / investment models, a country will tend to accumulate external assets if the private sector's wealth objectives are not fully satisfied by the rising value of real capital or government debt.[12] Perhaps more pertinently, at least for high-income countries, the country will tend to accumulate external liabilities if the value of real capital or government debt increases faster than private sector wealth objectives. To put this another way, when governments follow conservative fiscal policies and liberalize the financial system, the private sector becomes the arbiter of domestic credit creation and external financial balances, which in the context of a world with global capital and product markets generates sustained imbalances and presents ongoing risks of instability with alternating recessions and periods of recovery as fluctuations in asset valuations, increasingly synchronized, impact financial flows in each country.

As noted above, most of the discussion about the causes of the current crisis has focused on unsound mortgages, poorly-understood credit derivatives, financial de-regulation, etc., but it should now be clearer that these phenomena cannot be taken to be independent of the build-up of global imbalances and opposing tendencies towards under-consumption and excess borrowing driven by global trade and investment. As Baker (2010) has already warned, 'over-borrowing' is not to be understood as a marginal phenomenon of citizens without proper jobs applying for unaffordable mortgages; Singh and Zammit (forthcoming, 2011) highlight this by comparing the formation of asset bubbles in the US with the classic 'tulip-mania'. Rather, over-borrowing needs to be understood in the accounting sense of spending in excess of income.

Before summing up, a couple of clarifications are due regarding sector and income distribution within countries. The analysis so far has been concerned with aggregate behaviour in each country and the world economy as a whole. A more realistic analysis, but one which is difficult to implement systematically for the periphery, will take account of the role of different institutional sectors.

For example, rich households may be predominantly concerned with accumulating financial wealth, poor households with preserving spending and social entitlements, local firms with building up their financial position, international firms with expansion of capacity or cost-saving strategies.

In addition to income distribution considerations within the household sector or between productive sectors, there is also the role of policy makers in influencing aggregate income and wealth by fiscal and monetary policy. In the US, for example, broadly relaxed monetary policy over the last decade contributed to a rise in asset prices and wealth revaluations, leading to a continuous rise in private spending while government spending (including military) helped to sustain aggregate income.[13] In China, India and other industrializing countries, an important growth driver has been fixed capital investment. Yet, in most countries of the periphery, including India, fiscal policy is constrained by the risk of adverse reactions by international investors. To base economic policies on enlarging the fiscal deficit the government would have to get out of the vortex of globalized finance 'which requires a basic regime shift of a sort that we are ruling out *ex hypothesi*' (Patnaik, 2006: 1770). A bias against fiscal expansion and growth of government debt has been institutionalized by the European Union in general and the Euro zone in particular and there is currently strong pressure in Europe to claw back the impact on government debt of rescue measures during the crisis by imposing more or less drastic cuts in government expenditure and deficits even if this implies significant damage to employment prospects and social programmes.

We can sum up by making three observations. First, there seem to be empirical and theoretical grounds to back the under-consumption thesis[14] applied to the last decades of globalization and growing imbalances. Central to this thesis is the pressure to maintain a high rate of profit for the world as whole, which, as noted by Singh and Zammit (forthcoming, 2011), implies a tendency towards global deflation. In terms of imbalances, that would mean a competitive race to the bottom in which country after country strives to rebalance and achieve a surplus by contracting demand. Yet, the world economy seems to have escaped from this predicament by a combination of factors promoting over-borrowing in a few major countries. To sustain this, asset prices and public or private borrowing and deficit spending must keep rising. However, neither global deflation nor large financial imbalances are sustainable in the long run. The policy response that emerged in the current recession could be termed 'muddling through' as market forces quickly reassert themselves after costly but short-lived government intervention. This is not good enough. Even if some countries are able to incur net deficits, raising their income and securing holding

gains at other countries' expense, it does not follow that satisfactory growth of world income can be sustained on this basis. Furthermore, as shown by Akyuz (2008), systemic instability will increase and this will hit many developing countries as crises erode earlier gains and may on occasion produce longer periods of stagnation.

The second observation follows from the first. Since the combined result of plans and expectations played out through the markets does not warranty a satisfactory outcome, there is a need for policy action at the country level. More specifically, fiscal and monetary policy and an environment conducive to stability in financial, goods and labour markets are required in order to adjust or compensate the autonomous behaviour of households, firms, banks and foreigners. However, the extent to which the policies of countries taken separately can achieve significantly better outcomes for the world as a whole is limited, and the risk is high that new imbalances or periods of low growth will re-emerge. For example, Akyuz (2010b) argues that a strategy based on domestic reflation and income redistribution in China, which would seem the natural course of policy action given the discussion above, may not be good enough for the world as a whole and may leave trading partners worse off. This is because shifting from export demand to domestic demand implies a large change in China's import propensities and may not provide much stimulus to demand in the world as a whole.

Thus, our third observation is that policies at the national level need to be coordinated systematically and in different fields of action in order to achieve sustained and satisfactory rates of growth and of employment for the world as a whole. This is the position taken by leading institutions, like the UN (UNCTAD, 2009; UN-DESA, 2006a, 2007, 2008, 2009; UN-GA, 2009), institutes like the South Centre in Geneva (Khor, 2010) and to an extent by the Group of 20.[15] The interest in strategies of international policy coordination is not new, however. In the late 1970s and the first half of the 1980s, in the face of recurring crises after the breakdown of the Bretton Woods system, comprehensive proposals for global demand management were argued (e.g. Cripps and Godley, 1978) as academics and policy makers intensified the search for new policy rules for the world economy (Bryant et al., 1989). However, rising confidence in market-driven solutions since the mid-1980s contributed to subsequent neglect of the need for active and coordinated government intervention.

6. World Economy Scenarios: Global Imbalances and Future Policies

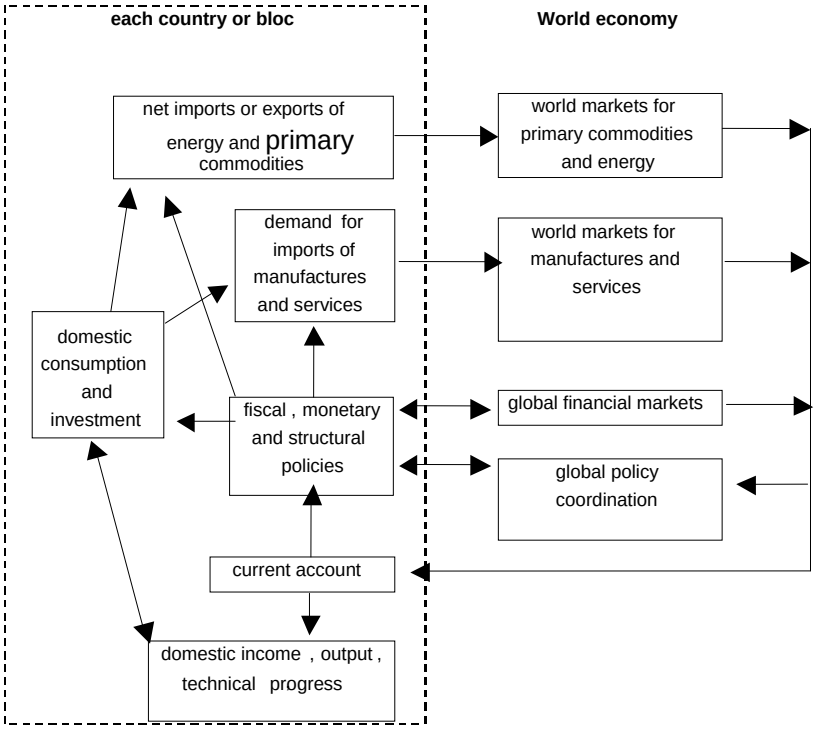
In this section we seek to quantify implications of the preceding discussion with the help of simulations for the world economy over the next two decades. Our aim is, firstly, to construct a long-term projection for the world economy (the 'baseline'), conditional upon the assumption that no relevant changes of policy take place and the additional assumption, perhaps more artificial, that the triggers that usually lead to economic crises (shocks to confidence or regime changes caused by rapid rises of asset or commodity prices, or over-indebtedness) are not activated. The properties of the outcome obtained under such conditions will be inspected in order to assess its viability, the extent to which tendencies towards under-consumption and over-borrowing are manifested, and the degree to which global imbalances re-emerge. On this baseline we then superimpose a scenario suggested by Akyuz (2010b); namely pro-active policies in China and India aimed at achieving high and sustained rates of growth by shifting away from reliance on export demand and towards domestic absorption. The results will be inspected to verify consequences for these two countries and the world as a whole with respect to the baseline. Thirdly, a more engaging but more hypothetical internationally coordinated policy package will be tested to assess requirements for a more equitable outcome for the world as a whole.

The simulations are constructed with the Cambridge-Alphametrics model (CAM), which is a derivative of a model originally developed at the Department of Applied Economics of the University of Cambridge (UK) in the late 1970s (see Cripps et al., 1979). Since the 1970s the model has been modified various times in significant ways taking advantage of the improved availability of statistics and reflecting more recent historical experience. In this article we use essentially the same version of the model as in the paper mentioned earlier (Izurieta and Singh, 2010) with a slightly different bloc aggregation and some improvements in the estimation of debt variables, fiscal and monetary policy, and the generation of institutional balances.[16]

Characteristics of the model worthy of mention here are:

a) The model uses official data from over 120 countries plus residuals for each continent (thus including the entire world economy). The main sources of data are the UN Department of Statistics, UNCTAD, the IMF, the OECD and a few other institutions. Missing data are estimated and inconsistencies reconciled according to customarily accepted practices for large accounting models. Historical estimations and simulations of the

future use a flexible bloc aggregation of data for individual countries. Simulations in this article use a nine bloc decomposition of the world. Developed countries are represented by the US, Western Europe and 'other high-income' (including Japan and the advanced countries in the Pacific, Canada, as well as the newly industrialized countries of East Asia). Among the developing and emerging economies China and India are taken individually. The bloc of 'resource-rich middle-income' countries includes the former USRR, West Asia and other middle-income countries of East Asia. Low-income countries in East and South Asia form another bloc. The remaining two blocs are Africa and Latin America.



b) The economic structure of the model can be represented by the following flow-chart, which is quite self-explanatory. A few qualifications are in order. At a country/bloc level, income, output and technical progress result from the interaction of domestic and external demand and constraints. Complementary to the underlying structure of demand that triggers technical progress according to historically observed patterns, supply continues to exercise a role as natural resource and energy constraints feed-back via domestic and international prices. World markets for manufactures are represented bilaterally and market shares

depend on inherited technology and costs. Markets for primary commodities, energy and services are unified.

c) Global financial markets match current account flows with the capital account and reserves and determine the valuation of external positions. In addition, the current account and external positions have a feedback on domestic spending decisions, where imbalances usually deter expansions of domestic demand.

d) Within this structure, model equations are defined by accounting rules, stock/flow dynamics and other adjustment processes representing private sector and government behaviour. Behavioural equations are estimated using pooled cross-section data from 1980 onwards. Residuals are examined and tabulated such that assumed shocks and policy adjustments in simulations are confined to the range of plausible values suggested by history.

e) As the model is fully endogenous (in the weak sense that to each variable there is an equation, even if an identity or at times a simple autoregressive process) an unadjusted baseline can be projected into the future without any explicit new assumptions, but in practice the baseline requires some adjustment in the light of current developments and anticipated changes in trend. Scenarios are constructed on top of the baseline by imposing shocks or policy packages (targets and instruments with various types of adjustment rule).

The model is well-suited for the task at hand for various reasons. First, the stock/flow structure ensures that income and expenditure, financial flows, holding gains and asset values are consistent for all countries and institutions and for the world as a whole. Wealth, inclusive of holding gains, influences consumption, and investment (an accelerator function) is additionally influenced by the stock of capital. Deficits and costs of past bail-outs accumulate to exert a constraining force on government spending. Second, international trade is sufficiently disaggregated into the relevant categories: primary commodities, energy, manufactures and services. Therefore, it is possible to assess the evolution of trade and GDP performance as countries diversify out of extraction activities as suggested in Patnaik's 'diffusion of activities'. In addition, exports and imports are influenced by inherited patterns of specialization and thus it is possible to trace changes in import demand as a country shifts between export demand and domestic demand. Third, policy is designed in a way that comprehends both endogenous patterns embedded in

historical relations, like rules for determination of the fiscal stance and monetary policy targets as well as ex-ante changes introduced as shocks or 'add-factors'. In addition, policy simulations are constrained by 'historical constancies' and require explicit specification of sets of instruments and patterns of adjustment to achieve desired targets. Finally, the model is historically determined and the model's structure is, to the extent possible, geared to capture variations from bloc to bloc and over time in ways that are endogenously determined. In other words, if a country's performance is different than elsewhere, it is generally because relative income, balance constraints, terms of trade, etc., exercise a discriminating difference and, to the extent that such differences narrow or widen over time, so do the implied changes in behaviour.

The way in which this model resolves the usual limitations of representing the dynamics of inflation and income distribution in realistic fashion also needs to be understood. For example, as a departure from the rather pervasive use of production functions à la Cobb-Douglas to represent growth,[17] in this model the fundamental conditions underlying supply are captured by historical estimation of technical progress triggered by the forces of domestic demand and export diversification. Supply constraints are reasonably well transmitted through volume and price changes by the estimation of capacity constraints leading to price escalations, but such changes do not trigger the usually rigid endogenous responses that can be observed in 'inflation-targeting' models. On the one hand, the often assumed impact of the interest-rate response to inflation attributed to such models disregards the problem of 'pushing from a string' as much as the perverse impact of interest rates on prices. Besides, as happens in other empirical models that cover a large number of countries, it is impossible to include important asset prices such as real estate and stock market indexes explicitly. On the other hand, the combination of inflation and interest-rate dynamics has, in reality, ambiguous interactions with the exchange rate and external demand. Thus, in this model there is a weak response from supply constraints via interest rates and therefore monetary policy is not as effective as textbook economics proclaims. Meanwhile, price inflation dynamics are sufficiently well captured and, apart from the endogenous impact on output, however weak, the modeller must take price escalations as 'amber lights' when inspecting the viability of a model solution.

With respect to income distribution, the CAM model lacks the typical wage–profit schedule that is usually at hand in other models that explicitly assess dynamics of income shifts as development proceeds. The latter kind of models, of which the most notable ones owe to the 'structuralist' tradition initiated by

Lance Taylor (Taylor, 1991; Naasetepad and Storm, 2006; Vos et al., 2002; etc.) offer a rich variety of insights by evaluating whether growth is profit-led or wage-led, and whether productivity growth is labour-displacing or labour-augmenting in different economies. But this is not the only way to analyse distribution dynamics in the context of development, particularly in instances where the focus is on the role of public policies which only indirectly inflict on wage or labour income (Storm and Naastepad, 2005), or where the structure of firms is critical for the aggregate outcomes (Singh, 1998); or where the wage–profit structure is not a fair representation of the income-generating process, as in many developing economies; or where the approximation of capital and wage income by the national accounting components of value added would rather obscure the basic facts on the ground. Moreover, the wage–profit schedule suffers, at present, from critical limitations given the excessively aggregated character of such statistics where available (a similar limitation applies to aggregate production functions, as correctly summarized in Temple, 2006), not to mention the practical unavailability of wage and profit data in many parts of the developing world. Thus, in this model the approach is to focus on aggregate demand and its components as resulting from the influence of policy measures, in line with the theoretical discussion outlined above, and to hold to the assumption, which would seem hard to question, that improvements of domestic consumption and government spending at par with the growth of national income cannot but reflect improvements in income distribution. In other words, the evolution of income and consumption aggregates in the context of development are assumed to follow 'Engel curve' patterns and government spending stimuli are assumed to be welfare-improving.[18]

7. The Baseline Projection

As hinted above, the baseline can be understood as an extrapolation of the past on given policy assumptions, ruling out any major changes of policy regime.[19] The growth of the main variables is summarized in Figure 1. The 'bounce-back' from recession continues into 2011. Although growth rates of trade and investment in the immediate recovery phase are no guide to what will follow, the baseline assumptions imply GDP growth sustained at a reasonably high rate thereafter while trade slows down, energy supply and use increase very slowly and inflation moderates after a peak in 2015. At first sight the global outcome looks good but we need to check how GDP growth is distributed between blocs and, recalling that the baseline is predicated on the absence of negative shocks, we need to examine the implied evolution of financial imbalances.

The baseline is not, however, a mirror of the past, even if the underlying patterns are similar. So far as GDP growth is concerned Figure 2 shows relative long-run slowdowns for China and India, weaker growth in the US after 2012 and disappointing growth in low-income Africa. As noted in the discussion above, price dynamics and supply constraints operating in the model influence the outcome. As China, and to a lesser extent India, have grown at a fast pace in the pre-crisis period, they have added to the global demand for raw materials, energy, transport services, and also food and basic needs. As a result, competitiveness at the low-end of the manufacturing chain (more heavily dependent on inputs) results as well in a partial deceleration of capital outflows which were supposed to help sustain over-borrowing in other regions like the US. The gradual acceleration of GDP growth in 'other high-income' countries is mostly driven by Japan, which will benefit from its export capacity and accumulated foreign assets. The 'resource-rich middle-income' bloc shows a sustained growth performance on the back of a relentless increase in the price of oil and relatively high prices of commodities (see Figure 3).

Figure 1. World Growth Rates

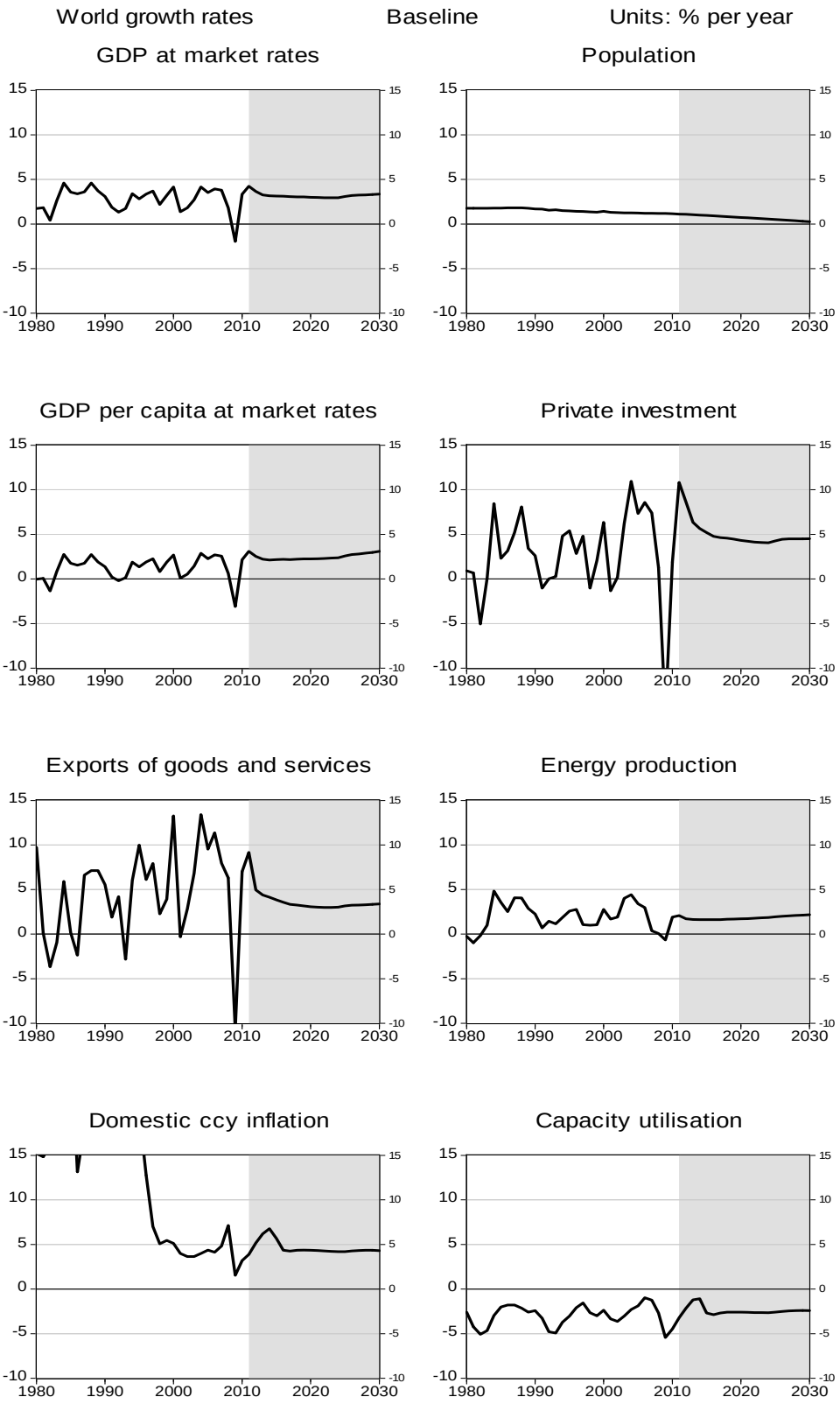


Figure 2. GDP Growth Rates in Each Bloc

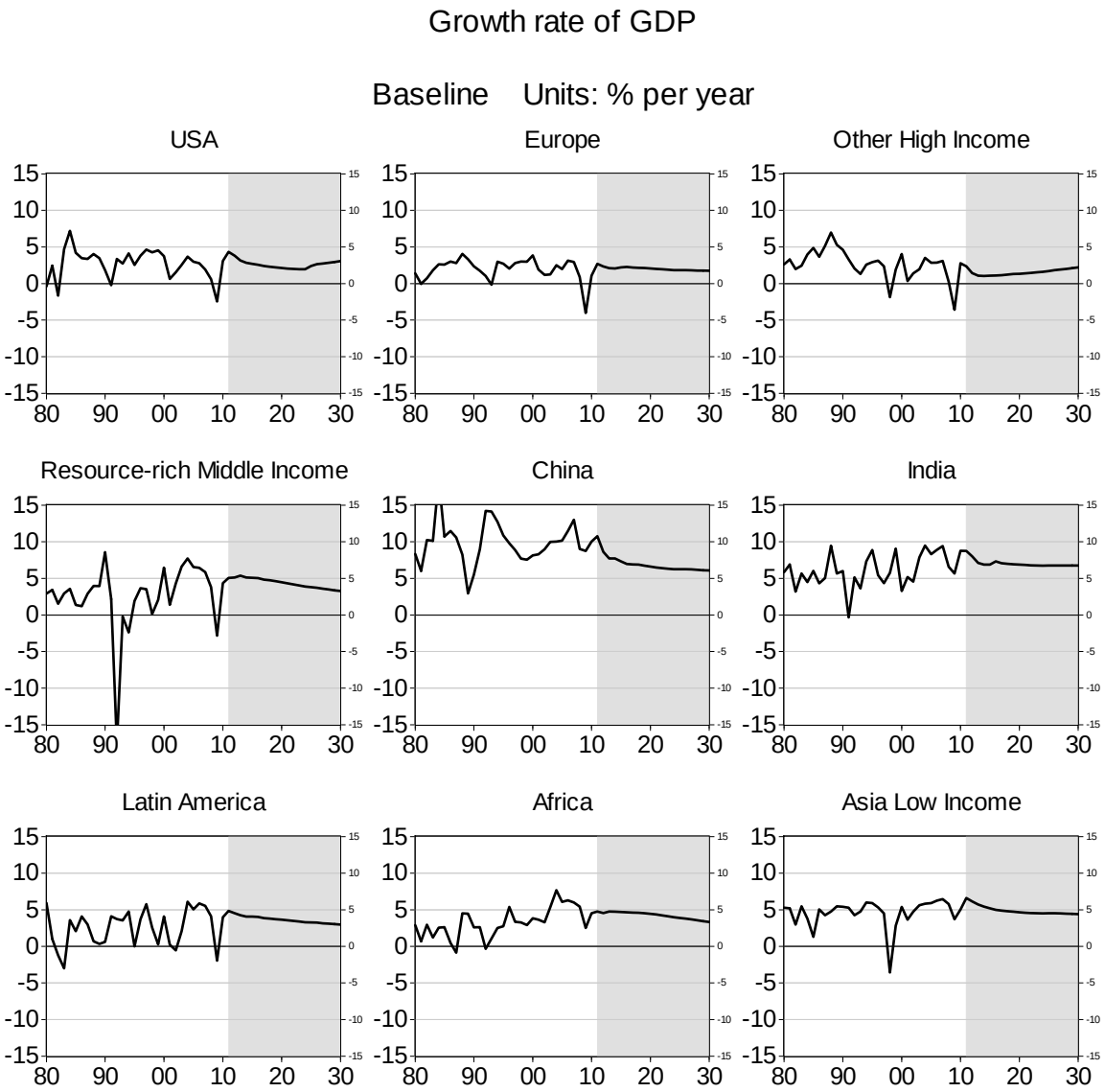


Figure 3. Relative Price Indexes

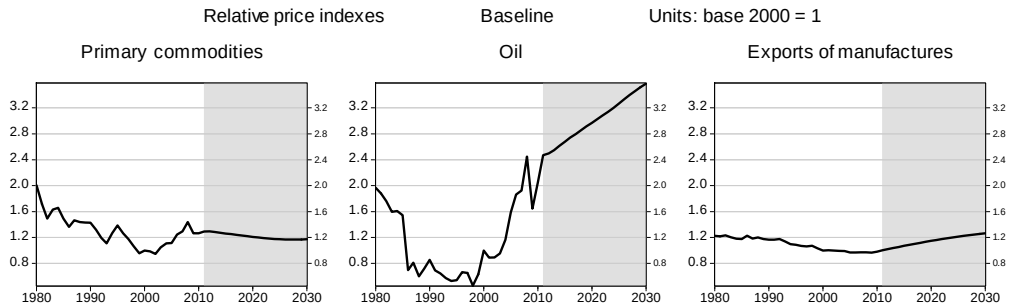


Figure 4. Current accounts as percent of GDP

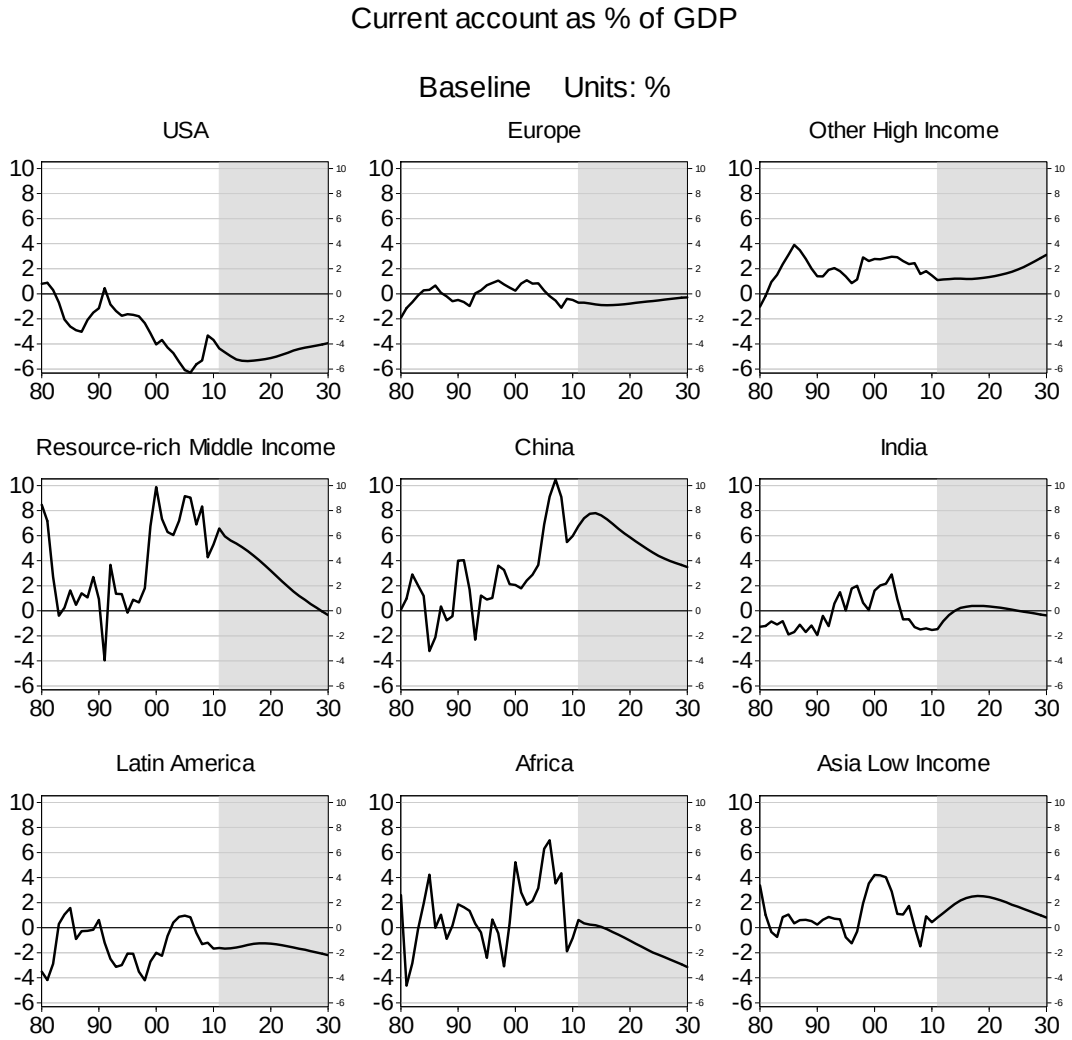


Figure 4 shows global imbalances reasserting themselves with a similar pattern to the past, subject to the relatively more gradual growth of demand in the main developed countries. It can be estimated that the US becomes a very large debtor with net liabilities rising to 100 per cent of annual GDP while Japan, China and some other East Asian countries acquire net assets of a similar magnitude.[20] Surpluses in resource-rich countries as well as in Africa will gradually fade away as growth will continue to require greater domestic spending (infrastructure and private investment) facing higher prices of manufacturing products (see above).

Given the slowdown in global market penetration by China and India projected in the baseline it is reasonable to ask whether these countries could compensate

by faster expansion of domestic spending and what the consequences of such a policy shift would be for the US and other high-income blocs on the one hand and other middle- and low-income blocs on the other.

8. Domestic Expansion in China and India

The next simulation assumes development strategies in China and India consistent with targeted GDP growth of 8 per cent p.a. for each country. Crucially, these strategies have to overcome under-consumption tendencies and be financially viable and acceptable to international and domestic investors.

The assumed measures in both countries include shifting the focus from export activities towards domestic consumption and investment by changing regulations and incentives. Initial stimuli are amplified by private spending multipliers, reducing government deficits and, pari pasu, eroding the current account. In the case of China the reduction of the current account surplus is marked and net accumulation of external assets eventually comes to an end. The impact on the current account and external position is much smaller in the case of India because of the relatively closed structure of the Indian economy.[21] In both countries the emphasis on faster growth of income through incentives to private consumption and investment reduces the ratio of government debt to GDP.

The most significant outcomes of this simulation are the implications for the US and other countries (see Figure 5). There is little increase in trade in the world as a whole because domestic expenditure in China and India has a low import content, as pointed out by Akyuz (2010b). Benefits, such as they are, accrue mainly to other rich countries, which presumably increase their market share in world exports of manufactures and services as China and India shift to domestic spending (Figure 6). There is almost no 'trickle-down' of domestic expansion in China and India to the rest of Asia or to developing countries in Africa and Latin America or even to oil and commodity exporters in the 'resource-rich middle-income' countries.

Indeed, China's current account surplus is transferred to other rich countries and likewise for the deterioration of the external balance in India (Figure 7). Accumulated net external positions follow a similar pattern (Figure 8). In sum, this scenario yields reasonably good growth patterns for China and India with

Figure 5. Change in global growth rates

World growth rates Baseline (broken line), Domestic reflation in CN + IN (solid line) Units: % per year

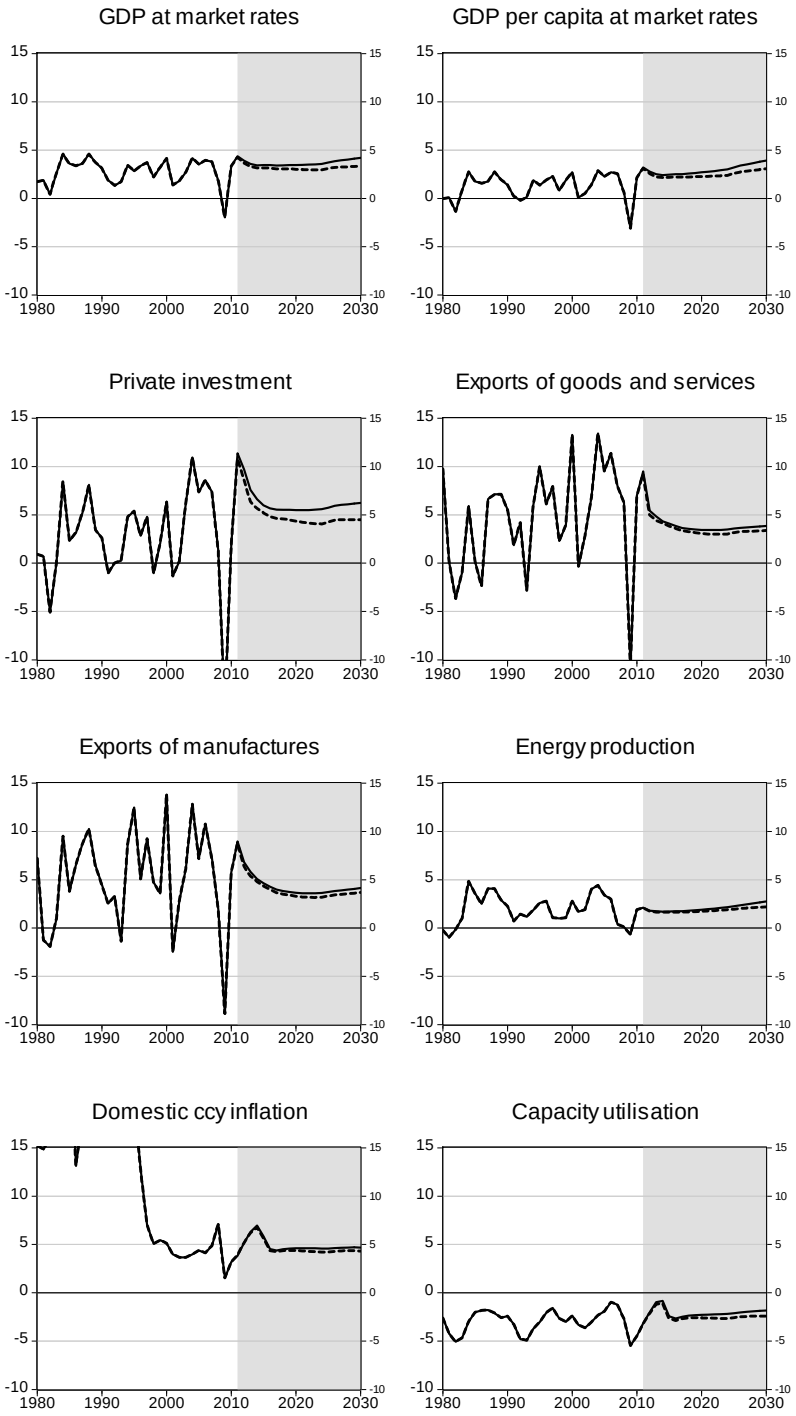
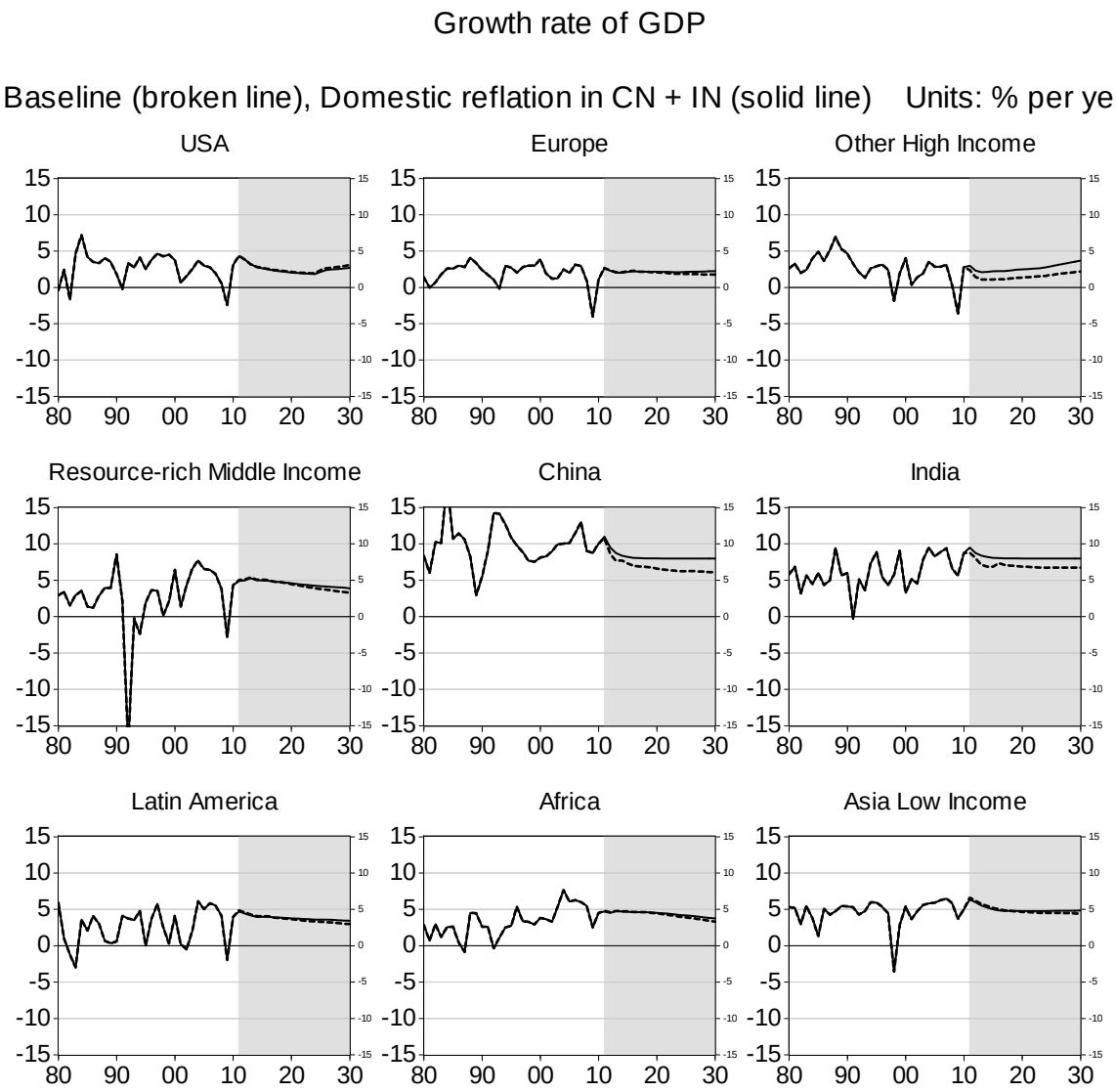


Figure 6. Higher GDP growth in rich countries, little benefit to other regions



potential benefits to internal income distribution. Thus, from their perspective alone results are satisfactory. But the outcome is less reassuring from a global perspective. Although financial surpluses in China and India diminish, the same cannot be said for imbalances in other countries (the current account deficit in the US remains dangerously high and the surplus in Japan and some other high income countries is unprecedented). Therefore the risk of renewed financial crisis remains as external positions become larger and increasingly unbalanced.

Equally important, this China–India growth scenario does not benefit the rest of the developing world and therefore does not contribute to the resolution of tensions implied by global inequality.

Figure 7. Surpluses of China and India transferred to other rich countries

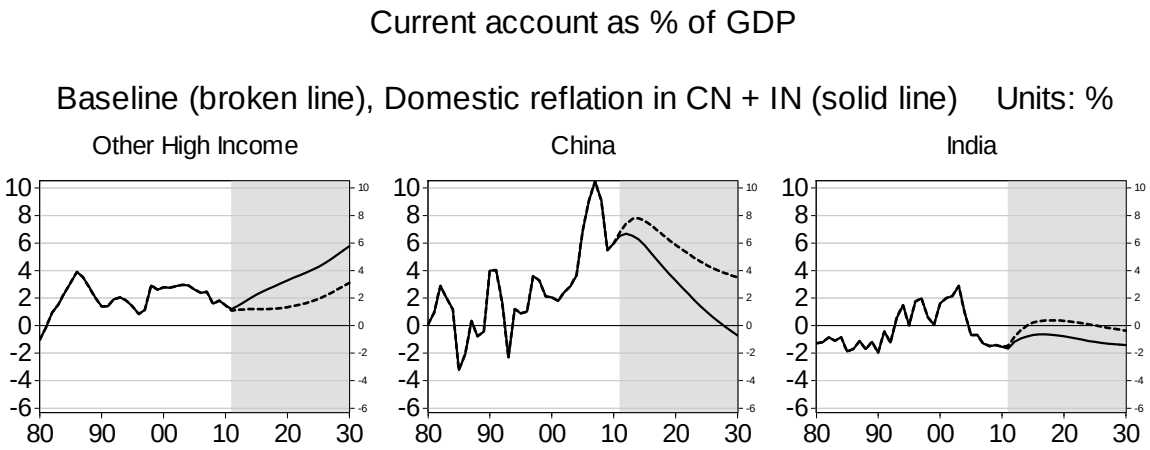
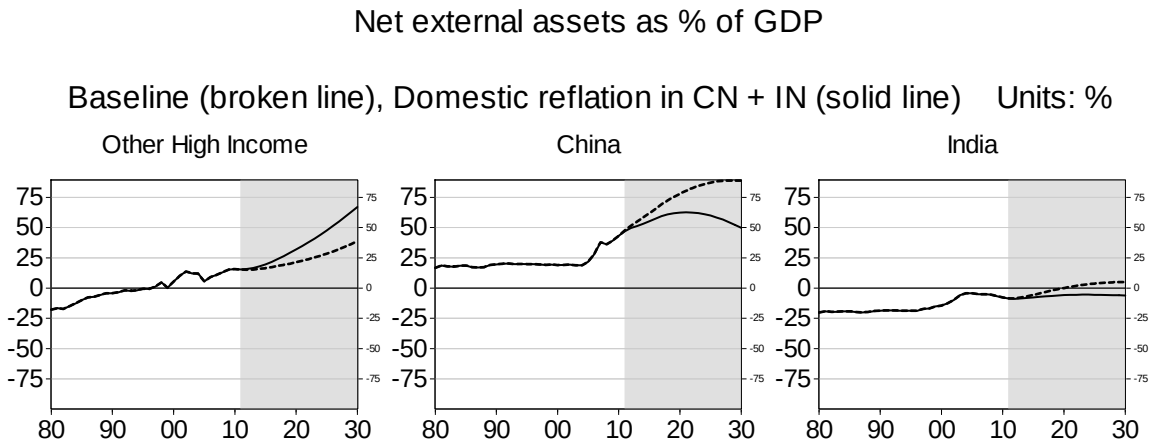


Figure 8. International positions follow a similar shift over time



9. A Global Development Scenario

If the baseline scenario is prone to crises and marked by a tendency towards under-consumption and over-borrowing in different blocs manifested in re-emerging global imbalances, and if the scenario by which China and India attempt to correct imbalances in their own countries by unilateral policy action in isolation fails to reduce global imbalances or contribute to the reduction of

global inequality elsewhere, a more sustainable global development perspective has to be differently designed. A global development scenario will require coordinated policy efforts by many countries across different policy areas. An empirical assessment of this kind is attempted below and should be interpreted as an illustration of a feasible and attractive scenario in its own economic terms, given that the previous ones are not, even if are politically more 'accessible'. After scrutinizing the reliability and internal consistency of this scenario, the onus rests on public opinion and on policy makers to take a model simulation of this kind to the next level.

Globally coordinated economic policies are potentially beneficial for all but require a high level of engagement and must attend to several issues simultaneously.[22] For example, as shown in Izurieta and Singh (2010), a major obstacle to a global growth convergence strategy is the pressure on world supplies of raw materials and energy. Policies targeted on renewable resources, efficiency of production and use of energy and primary commodities, and reduced pollution and emissions are required to alleviate this constraint. Likewise, if poorer countries in the developing world are going to grow at a fast pace, additional efforts have to be made to accelerate and diversify export growth and to avoid rising domestic and foreign deficits. Such developments will not happen spontaneously. For export-oriented development to succeed, infrastructure has to be put in place, and market access, technology and upfront investments must be secured. Also, to achieve a meaningful turn-around of the tendency towards under-consumption, export growth needs to be paralleled by rising domestic demand and rising real wages.

The global development scenario illustrated here is defined by a combination of:

- targets for government expenditure, public and private investment that supposedly facilitate a more equitable distribution of employment and income
- stable real exchange rates and greater efforts towards formation of regional trade areas in developing regions
- selective incentives and support for exports of commodities, manufactures and services by countries that lack a sufficient export base
- cooperation in management of energy resources and markets to maintain incentives for producers and users of energy to invest in green technologies and reduce long-run dependence on fossil fuels.

The targets for income growth and energy saving imply GDP growth in the world as a whole rising gradually from 4 per cent to 5 per cent with energy

Figure 9. A Global development scenario

World growth rates Baseline (broken line), Globally coordinated development (solid line) Units: % per year

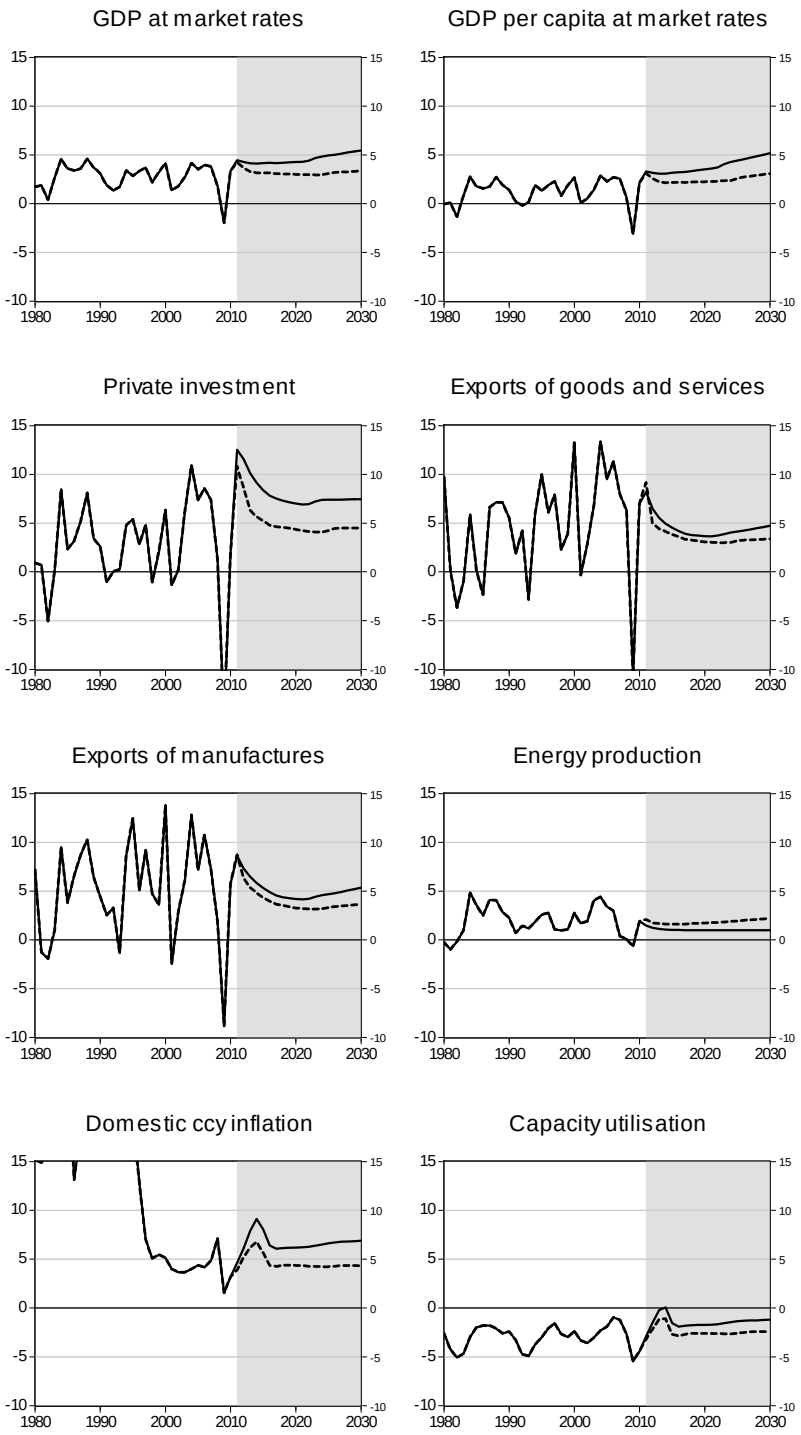
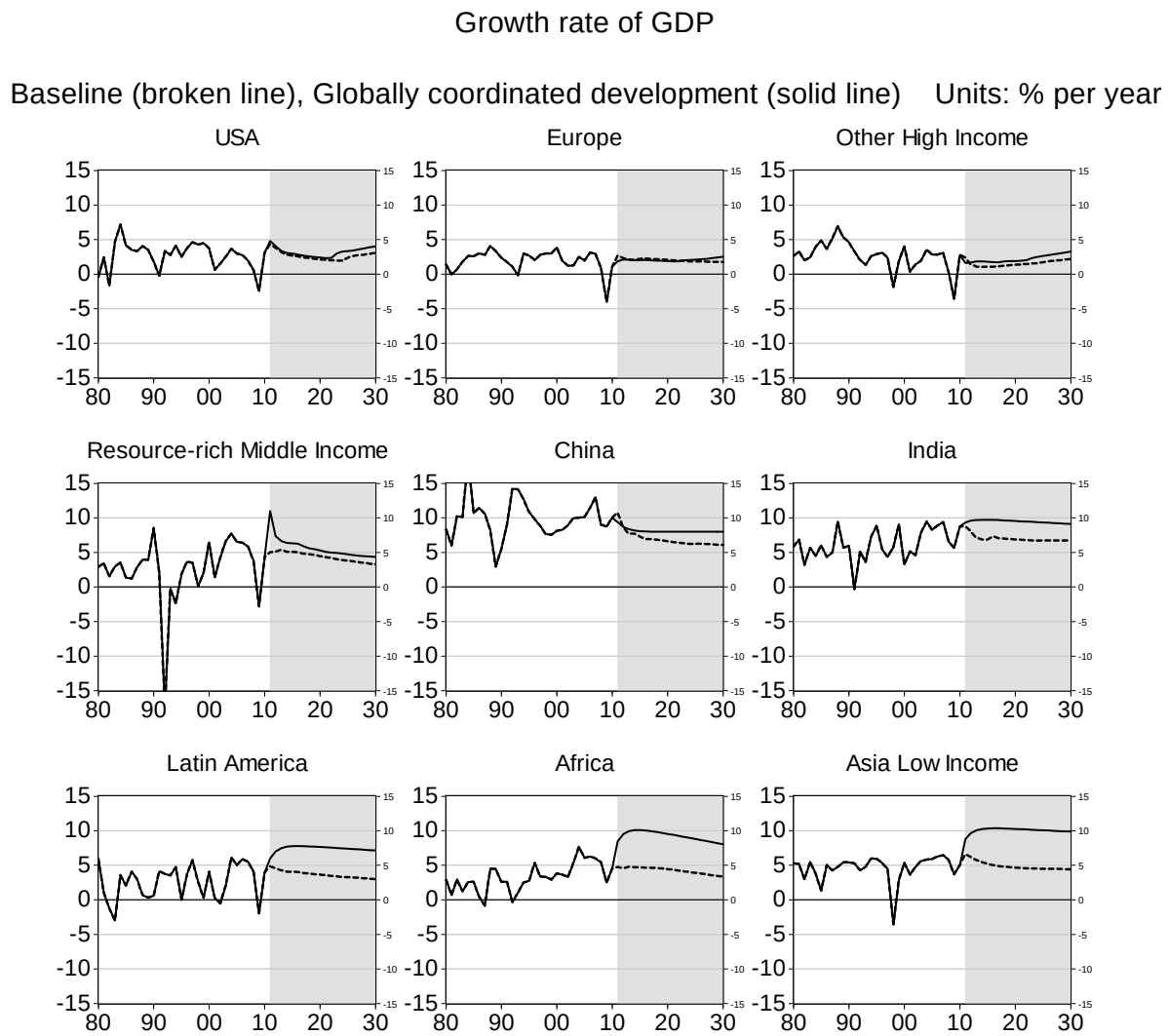


Figure 10. Convergence of growth rates without sacrifices



production and use restricted to about 1 per cent per year.[23] Growth of investment and trade is faster than in the baseline and capacity utilization is higher, resulting in somewhat higher inflation rates (Figure 9). The full complement of demand policies and structural policies, implemented by all countries working together, could potentially achieve target growth rates for all developing blocs (Figure 10), resulting in a major reduction in global inequality without requiring any reduction in growth rates in high-income countries.

Faster growth rates and greater reliance on export diversification in poorer blocs help to reduce the ratio of government debt to GDP in all developing regions as well as global imbalances in the form of current account surpluses and deficits

(Figure 11). Deficits in developing regions remain manageable. Accumulating external positions (Figure 12) are in most cases much less extreme than in the baseline.[24]

In summary, therefore, there is a huge potential for improving the performance of the world economy and achieving substantial convergence of GDP and income levels in low and middle income countries with levels already achieved

Figure 11. Significant reduction of global imbalances

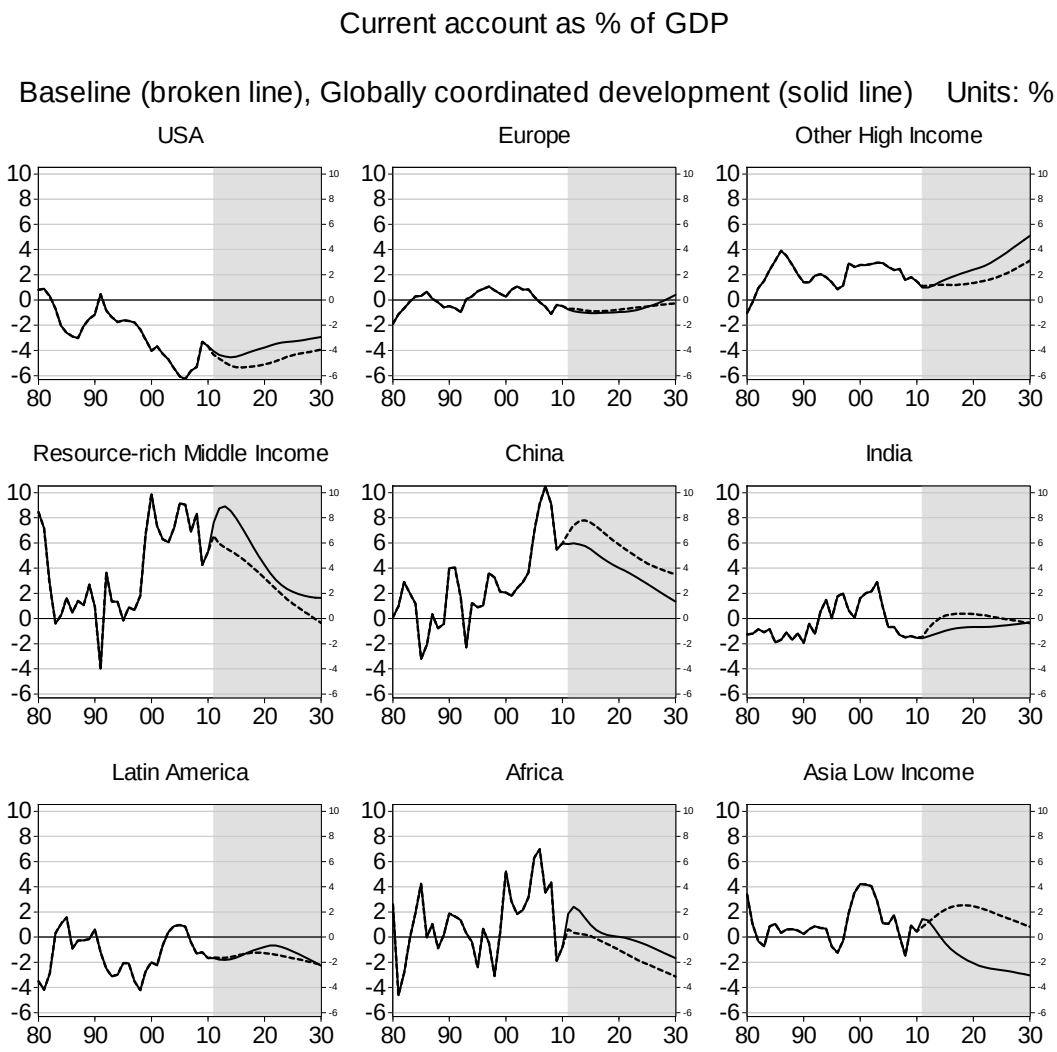
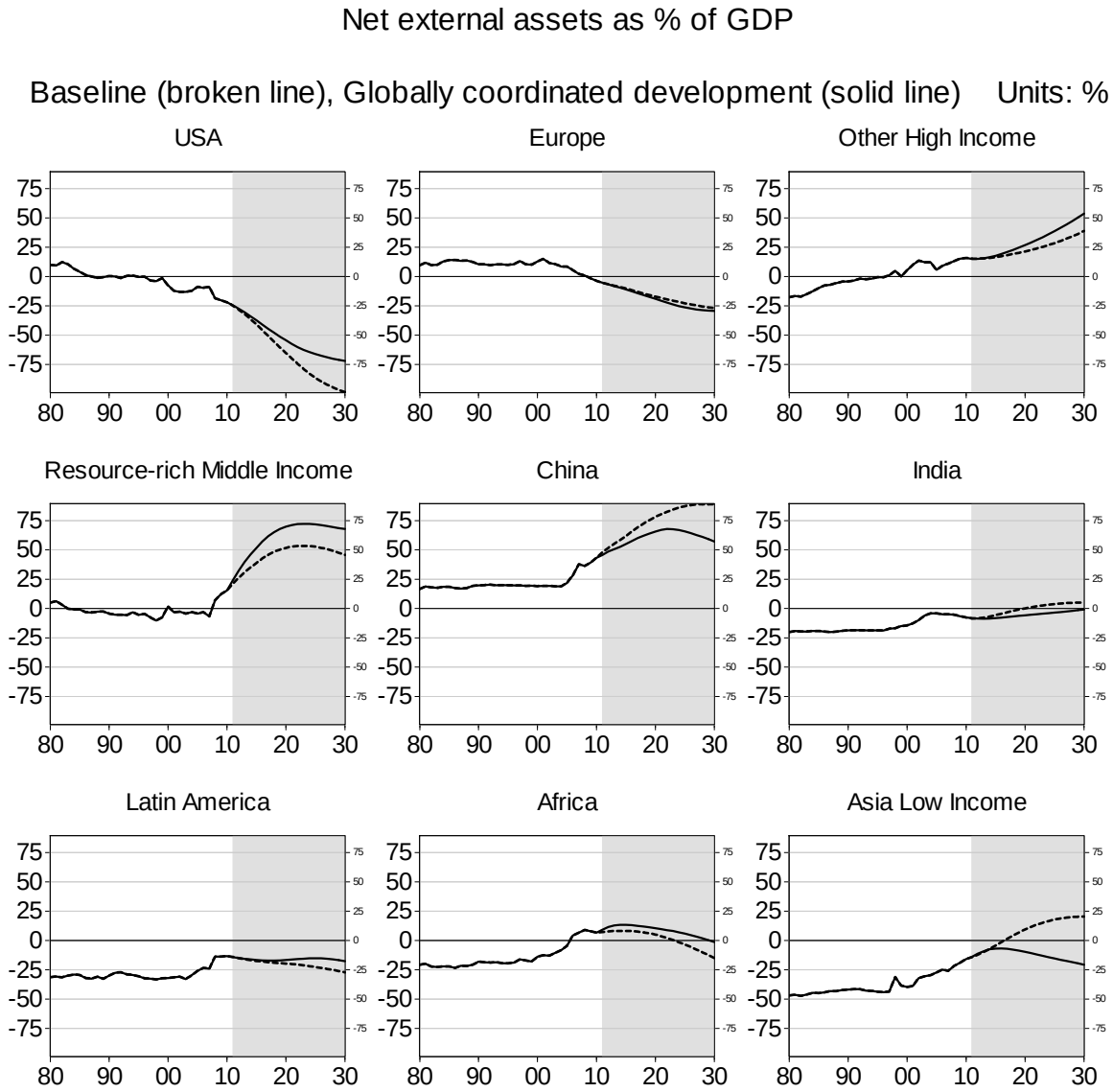


Figure 12. Relative improvements over inherited external positions



in high income countries. But realization of this potential requires major changes in the way economic policies are decided at national level and coordinated internationally. The change in paradigm has to start with the realization that the world economy today is far from being a level playing field in which vigorous competition benefits all comers. In reality it is a complex and

somewhat unstable system in which advantages and problems accumulate over long periods of time where market-determined patterns of development often have unintended side effects and in the worst cases imperil the security of the world as a whole. The starting point for improved policy coordination has to be a more realistic analysis of the operation of global markets and the world economy as a system with attention to long-run as well as short-run effects and acceptance of the need to balance the interests of the vast majority of people in the world, not only those in highly developed countries or in command of particularly scarce resources.

10. Conclusion

Over the past two decades the world economy experienced an unprecedented build-up of global imbalances, followed by a severe global recession. Meanwhile, the underlying globalization process did not in most cases improve the real incomes of the majority of the world population in line with the improvement in the distribution of income among countries. In the period before the current crisis the real world economy seemed to perform exceptionally well. Between 2003 and 2007 it achieved a remarkably fast growth of aggregate world product of more than 5 per cent per annum in purchasing power parity terms. Developing countries grew much faster than developed countries and the number of people living below $1.25 a day fell to less than a billion people. A notable aspect was fast growth in India and China, the world's two most populous countries and hitherto among the poorest.

However, as argued in this contribution, such growth was based in major advanced countries on over-borrowing, domestic deficits and bubbles in the property and stock markets, while major emerging economies sustained an export model by the relative under-consumption of their workers. The liberalized global economy was guided by the ideological belief that free markets not only provide efficient allocations by prices, but also that they can correct themselves if they are out of equilibrium. The deep economic and financial crisis led to welcome first steps towards a measure of cooperation between nation states. The international agreements on interest rate cuts, fiscal stimuli and other measures among the G20 helped to avert a meltdown of the financial system in advanced countries. This notwithstanding, instead of success leading to greater future cooperation, as many of us expected, the result has been the opposite, currently calling for restraint in the stimuli while the world economy has not, and could have not, recovered from the deep crisis in which it was immersed. This does not augur well for the world economy or for the well-being of the people.

John Maynard Keynes repeatedly observed that the economy was a highly complex machine which we do not fully understand. This article and the Cambridge-Alphametrics-Model on which it is based represent an effort to appreciate the complexities of the world economy and its components and to seek avenues for international policy coordination. The main message that comes out of this exercise is the realization that the world economy is highly interdependent and increasingly needs far-reaching and very many specific interventions for it to achieve its full potential while pursuing a better distribution of income and employment. This in turn requires deeper knowledge of the functioning of the world economy and new institutions to achieve the required high levels of cooperation between nation states. At the moment the primary global institutions of economic coordination such as the IMF are, regrettably, more a part of the problem rather than its solution.

Notes

1.A different kind of argument that sees the international financial system as having a built-in deflationary bias reaches much the same conclusion. The bias arises from the fact that debtor countries are obliged to contract expenditure while there is no such obligation on the part of creditor countries to expand, which also leads to a shortfall of demand at the global level.

2.These include von Arnim (2009), Barbosa-Filho et al. (2006), Blecker (1998/2000), Cooper (2005), Cripps et al. (2005), D'Arista (2007), Godley (1995, 1999, 2003), Roubini (2005), Rybiński (2006), Taylor (2010), Truman (2005) and White (2010).

3.Baker (2010) fully documents the very subsidiary role that sub-prime mortgages played as a contribution to the economic crisis in the US and shows how the build-up of asset bubbles was the central feature of the impending imbalances that led to a global crisis.

4.The rather more complex relationship between income deflation and the terms of trade is elucidated in Patnaik (2008).

5.A similar argument, coined 'transplanting industry' was put forward by Robinson (1979) to explain why there is no hope that the process of 'dependent industrialization' would lead to full employment even in the recipient country and cannot be a means for 'a line of development based on human needs'.

6.See Cornia (2010), van der Hoeven (2010), UN-DESA (2006b, 2010), Vos (2010) for global overviews; Sobhan (2010) for South Asia; Akyuz (2010a), Montalvo and Ravallion (2010) for China; and Galbraith (2010), Galbraith and Garcilazo (2004), Irvin (2008) for developed economies.

7.Since 2002 this trend was enhanced by dollar devaluation. The US, together with some other core countries, enjoys the privilege of incurring external debt in its own currency while holding assets abroad that are largely denominated in other currencies. Thus, a dollar devaluation does not increase the domestic value of its external debt but does increase the domestic value of external assets. In practice, between February 2002 and December 2007 dollar devaluation *vis à vis* major currencies was 34 per cent. External assets were US$ 6.5 trillion in 2002 and US$ 18.5 trillion in 2007. The devaluation alone increased the value of assets held abroad by US residents by almost US$ 5 trillion,that is about 30 per cent of US GDP in 2008. This is a very large holding gain, even if spread over six years.

8.It has also been suggested that holding gains accrued to foreign investors. It is difficult to evaluate the size and distribution of holding gains in peripheral countries as very few data are available on sector balance sheets and wealth.

9.At this level of aggregation, H represents the combined spending of the public and the private sectors, while Y stands for national income. Y therefore ignores taxes, which cancel out in the aggregate. H includes consumption and the acquisition of inventories and durable and investment goods by both the public and private sectors. The net acquisition of financial assets, NA, includes borrowing and financial investment by households, corporations and government. Netting out domestic transactions, the figure for each country represents financial transactions with non-residents that may further be broken down into inward and outward flows of direct investment and portfolio investment, as well as banking transactions and transactions by monetary authorities.

10.See Cripps et al. (2007) for greater analytical detail. Stock/flow consistent frameworks are treated extensively in Godley and Lavoie (2007), Dos Santos and Zezza (2008), and Dos Santos and Macedo e Silva (2010).

11.This identity is useful for examining private sector behaviour. Government budgets, financial operations and debt are identified separately in the model but for reasons of brevity will be omitted here.

12.Government debt comes into the equation because the net external position of a country is the sum of financial positions of the government and the private sector.

13.Moreover, according to authors like Galbraith (2008), the US has systematically relied on a proactive role of the state to sustain high rates of growth, based on institutions created with the New Deal after the Great Depression. In Galbraith's calculations, by adding direct government spending (on the military, health care, social security, education, etc.) to the amounts that are channelled through private institutions and foundations that either receive subsidies or can alleviate constraints by receiving tax-exempted donations, the public sector is behind more than 60 per cent of US GDP.

14.Admittedly a refinement of Paul Sweezy's Theory of Capitalist Development.

15.There are perhaps two not irrelevant differences between the position of the G20 and that of the UN. First, the G20 does not represent all nations and her leadership cannot be taken for granted, as emerged in the UN General Assembly Summit on the Global Financial Crisis, June 2010. Second, the focus of the G20 is recovery from the current crisis, by combinations of fiscal and monetary policy, but there is no hint regarding the existence of systemic faults in the world economy.

16.The CAM is at present subject to a major expansion under the auspices of the European Commission and the collaboration of a network of academic and policy-oriented institutions in Europe and various developing countries in Asia, Africa and Latin America. Furthermore, a more sophisticated version that fully integrates financial markets has been developed for the UN Department of Economic and Social Affairs, under the guidance of Rob Vos.

17.The issues of growth and production have been subject to controversy for decades and we do not consider the debate settled even if a considerable majority of macroeconomic models adopt, rather uncritically, Cobb-Douglas production functions (see Davidson and Kregel, 1994; Felipe and Fisher, 2003; Felipe and McCombie, 2006; Harcourt, 1972, 2006; Kaldor, 1996; Kregel, 1971; McCombie, 1982; Rada and Taylor, 2004; Setterfield, 2010; Taylor, 2004; Temple, 2006).

18.Ongoing expansions of the CAM under the 'Augur' project, and of the UN-DESA GPM under the guidance of Rob Vos, will contemplate, one way or the other, issues like employment and the demographic structure. The relevance of the former for welfare is straightforward; the impact of demographics is under exploration, while some interesting findings are emerging from the Latin American experience (see Ros, 2009).

19.The reader may be tempted, as were the authors of this manuscript at the time of writing (first half of 2010), to consider a 'double-dip' recession instead. The rationale for a double-dip is obvious: global unemployment is likely to act as a major drag for aggregate demand; policy stimuli in many countries are likely to be withdrawn before private activity takes up the slack; high levels of public and private sector debt may inhibit the appetite for more deficit spending; and financial stress is nowhere yet dissipated. However likely, for such a scenario to be deployed as baseline, the modeller would have to bet on the proper timing and intensity of the factors triggering the subsequent crisis, which are uncertain to say the least. Besides, the nature of this exercise is not to 'predict' the future but to deploy plausible 'what if' scenarios. The chosen baseline should therefore be interpreted 'as if' the aggregate sectors in the countries and blocs depicted here will start to behave 'as usual', even if that entails greater leverage, greater risk, and excessive reliance on capital inflows in some parts of the world and on reserve accumulation in other parts, as recent history has demonstrated. Is that sustainable? Most probably not; hence the need to suggest alternative scenarios!

20.The continuous accumulation of external liabilities of the US before and during the world economic crisis has led many observers to believe in a presumed resemblance of the US with highly indebted countries in the developing world, like Argentina for example. There are critical differences, however. For one thing, the US as the *de facto* issuer of the world's reserve asset, is indebted in its own currency. For another, unless the structure of the global payments and reserve system is altered (which would mean by definition a break with the 'baseline'), for the global economy to continue to growth the US will have to continue to run even larger deficits in either the current or the capital account (the so-call Triffin dilemma). In the 'business as usual' scenario there is no assumed change of behaviour in the patterns of reserve accumulation by the US partners and therefore they will continue to invest in dollar assets in order, among other reasons, to protect the value of their investments.

21.India and other South Asian countries have lower ratios of imports to GDP than countries in other parts of the world.

22.The reader should be warned that what is presented here as 'a package' resulted from a considerable series of model experiments in which each of the measures proposed (or similar ones) was tried in isolation and the limitations revealed by such outcomes in isolation in turn triggered other elements now included in 'the package'. In other words, the elements necessitate each other, but each one in isolation is not going to yield a desirable solution.

23.Thus, the scenario requires improvements of energy efficiency of output at the rate of nearly 5 per cent compared with the recent past. This is not a negligible target and may lead to scepticism. It is worth mentioning that during the previous oil crises in the 1970s, some countries — notably France, Japan, and to a lesser extent Sweden, Germany and Switzerland — achieved comparable improvements, triggered by the circumstances. Over the subsequent years, similar success stories followed in Brazil and in China. At present, with even more advanced technologies and with greater international permeation of know-how and financing, it would seem that there are less 'economic' impediments for such improvements in efficiency to be widespread. Besides, with energy price escalations and environmental threats looming, it is hard to believe that the conditions are not even more pressing now than in the late 1970s for decisive policy action to take place.

24.The main counter-example is the bloc of other high-income countries, mainly due to Japan which would increase its current account surplus and external asset position in all scenarios. Increased surpluses in 'resource-rich countries' result from a reliance on the relative abundance of primary products and oil and diversification into manufacturing and services in these regions.

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