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Rebalancing Global Growth

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The global imbalances of the last decade were, everyone now realizes, a decidedly mixed blessing. They enabled China and other emerging markets to export their way to higher incomes. They allowed their central banks to protect themselves from capital-flow volatility by accumulating war chests of foreign reserves. They supported buoyant asset markets and rising consumption in the advanced economies despite what were, in many cases, slowly-growing or stagnant real wages. By 2004 observers were characterizing this as a happy complementarity of interests – as a stable and socially-desirable equilibrium that might run for another 10 or 20 years.[2]

In hindsight we now know that the prospects were not so happy.[3] Capital inflows fed excesses in U.S. financial markets that ultimately destabilized banking systems and economies on both sides of the Atlantic.[4] Those excesses bequeathed an overhang of debt and financial problems that now create the prospect of a decade of slow growth, or worse, across much of the advanced-industrial world. Although the implications for emerging markets have been more positive, here too there are indications that what worked in the past won't work in the future. Large export surpluses and low consumption rates are likely to give way in the face of demands for higher wages and living standards, and not just in China. A manufacturing-centered growth model that makes heavy use of cheap labor, consumes raw materials voraciously, and has a large carbon footprint is unlikely to be sustainable for another 10 or 20 years.[5]

That it is necessary to rebalance the global economy in order to create a sustainable basis for growth is now a commonplace. But this frequently-made observation is too infrequently accompanied by specifics. This paper attempts to provide some. Its first half describes the specific policy challenges facing the principal national and regional economies. The second half then adds numerical precision by analyzing how much adjustment in current account imbalances we can expect in the short and long run. Given the finding that emerges from this analysis, that rebalancing is likely to be an extended process with significant imbalances persisting in the short term, it concludes by asking what

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[2] The reference is of course to Dooley, Folkerts-Landau and Garber (2003). They take up the 10 or 20 years question in Dooley and Garber (2005).
[3] Don't say that you weren't warned (Eichengreen 2004).
[4] As argued by Obstfeld and Rogoff (2009) and Zoltan and Pisani-Ferry (2010).
[5] A popular discussion of this is Roach (2009).

can make imbalances safe for growth over the transition during which they are being resolved.

Section 1. Policy Challenges and Responses

A first observation is that global imbalances are not merely a matter of the U.S. and China. As Figure 1 shows, China was responsible for only a relatively small fraction of total global current account surpluses, especially toward the beginning of the decade. Even at its peak in 2007-8, the Chinese surplus accounts for only around a quarter of total global surpluses. More important prior to that point are the European surplus countries, led by Germany. Equally important in the critical 2005-8 period are the oil-exporting surplus countries. A smaller but still persistent and visible contribution is made by the other surplus countries of Emerging Asia. In this period as well there was again a significant contribution from Northern Europe (primarily Germany).

On the side of current account deficits, in contrast, the United States consistently dominates. Given recent events, however, it is impossible to ignore the evidence in Figure 1 of substantial deficits, in recent years approaching half of U.S. levels, in the now-troubled Southern European bloc. More attention, we now appreciate, should have been paid to this aspect of the problem before 2010.

The same basic message emerges from the top and bottom halves of Figure 1. Although the United States plays a disproportionately large role in the problem of global imbalances, the task of rebalancing global growth is not simply a U.S. story or even a U.S. and China story. A substantial number of countries, advanced and emerging, participated in the development of these imbalances. A substantial number, advanced and emerging, will therefore have to contribute if rebalancing is to be compatible with the resumption of economic growth in the advanced countries and its maintenance in emerging markets.

The United States. The U.S. current account deficit has fallen from its peak of 6 per cent of GDP to 5 per cent in 2008 and 3 per cent in 2009. With the onset of the financial crisis and recession, there has been a sharp swing in the private savings-investment balance, as shown in Figure 2. Measured household saving has risen from near zero to close to 8 per cent. Private investment, meanwhile, has dropped sharply as a result of recession and financial distress. The partially offsetting factor also shown in Figure 2 is the public saving-investment balance, or the mirror image of the fiscal stimulus that has been used to stabilize demand in the face of the crisis. In an arithmetic sense, the change in the current account balance is the difference between the rise in the net private savings ratio and the fall in its public counterpart, all expressed as shares of GDP.

The argument that this shift in the current account is more than transitory goes like this. First and most importantly, given that consumption is 70 per cent of U.S. GDP, the change in household saving is likely to be permanent, or at least very persistent. Deleveraging by the financial sector will make access to credit more difficult. Households

will face a continuing need to rebuilt their retirement wealth; they are not likely to see again anytime soon the kind of large capital gains on real estate and equity portfolios on which they banked in the low-savings years. With the end of the Great Moderation, Americans have been reminded that the world is a risky place, encouraging more to engage in more precautionary saving. Recent research (e.g. Carroll and Slacalek 2009, Mody and Ohnsorge 2010) provides some support for this view.

Second, a public-sector deficit on the order of 10 per cent of GDP cannot persist indefinitely. Exactly how and when that deficit will be narrowed is to be seen, but it is hard to dispute that it is subject to Stein's Law.[6] One thing on which it is possible to agree is that there is no single solution to the problem of restoring fiscal balance. A combination of revenue enhancement, entitlement reform, and reductions in discretionary spending surely will be required.[7]

There has been substantial debate about the impact of fiscal restraint on the current account. Our results, discussed in Section 2, suggest that there is indeed a noticeable (and statistically significant) impact, on the order of 0.3 to 0.4 ppts current account improvement for each percentage point increase in the budget balance. This suggests that fiscal consolidation over the medium to long term can make a significant contribution to global rebalancing.

Third and finally, one can imagine a subsidiary contribution to restoring current account balance from a modestly lower investment rate if it is the case, as some observers suspect, that the growth potential of the economy and rate of return on capital have been permanently damaged by the crisis.[8] Financial regulation that increases the cost of intermediation, and thereby the cost of capital, will work in the same direction.

With the United States saving more relative to what it produces, its net exports will have to rise. The historical rule of thumb, neglecting autonomous changes in foreign demand, is that a 1 per cent improvement in the U.S. current account requires a 10 per cent fall in the real trade-weighted dollar exchange rate to price the additional U.S. goods into foreign markets and shift domestic spending away from imports. This is the result that obtains in the OECD's economic model.[9] Some will say that the requisite shift is now larger because the U.S. manufacturing sector has been allowed to atrophy, reducing the country's export base.[10]

Stronger growth in the demand abroad for U.S. goods (think China) would moderate the magnitude of the necessary fall, while weaker growth in such demand abroad (think Europe) would accentuate it. Obstfeld and Rogoff (2007) and Eichengreen and Rua (2010) simulate these adjustments distinguishing demands for traded and nontraded goods and

[6] That something that can't go on forever won't.
[7] Given the small share of discretionary spending on the expenditure side, mainly a combination of the first two components.
[8] One can imagine, for example, that the additional debt bequeathed by the crisis will have to be serviced by levying higher taxes, including higher capital taxes, which will modestly discourage investment. Or one can imagine that capital/labor complementarities have been adversely affected by long term unemployment.
[9] Although it takes a few years for the full effect to be felt. See Herve et al. (2010).
[10] They may of course be underestimating the scope for expanding exports of services.

making different assumptions about the rate of growth of foreign demand. According to Eichengreen and Rua, halving the size of the U.S. current account deficit requires a 15 per cent in the dollar real exchange rate assuming an increase in demand in the rest of the world that offsets the posited 3 per cent of U.S. GDP reduction in U.S. demand (3 per cent of U.S. GDP being the posited change in the U.S. saving-investment balance). As the increase in foreign demand grows smaller, or even as the same increase in foreign demand is concentrated in a smaller subset of countries, the requisite depreciation of the dollar grows larger.

On balance it is hard to avoid the conclusion that more is needed to achieve a sustainable reduction in the U.S. current account deficit. The fall from the November 2005 local peak in the broad trade-weighted real dollar (Fed index) is less than 12 per cent.[11] Following the outbreak of the subprime crisis and then the Bear-Stearns and Lehman Brothers shocks, the dollar strengthened as investors fled to the safe haven of the U.S. treasury market. With the outbreak of financial turbulence in Europe in 2010, this experience was repeated; the dollar strengthened again, both against the euro and on an effective basis.[12] So long as the dollar exchange rate continues to be driven more by capital flows than by the correlates of the current account, and so long as the U.S. treasury market continues to be seen as a safe haven, it is hard to see how there the halving of the U.S. current account deficit can be sustained. One can imagine that, as continued capital inflows lead to mounting U.S. external indebtedness, the dollar's safe haven status will be called into question.[13] But it is hard to know when.

In the short run, then, it seems all but inevitable that as U.S. investment picks up and as that additional investment feeds through into more growth and demand, the U.S. current account deficit will widen again. The IMF (2010a) currently forecasts that this widening will be limited to no more than half a percent of GDP over the next five years. Either it is overly optimistic, or it is making additional, unspecified assumptions about dollar decline and/or strong demand growth abroad.[14]

Europe. For present purposes the European continent can be divided into two parts, Northern Europe (primarily Germany) and Southern Europe (Greece, Italy, Portugal, Spain, and the honorary member, Ireland), which will have to make very different contributions to rebalancing.[15] As Figure 4 shows, Germany's surplus and the PIIGS' deficits are now more or less offsetting (as they more or less were, Figure 1 above reminds us, for much of the preceding decade).

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[11] The downswing in the dollar began with the peak in February 22, 2002; the dollar has depreciated in real terms by 22% since then.

[12] And not just because of the weakness of the euro, but also because some emerging market economies such as China were reluctant to allow their currencies to appreciate against the dollar until the global implications of the crisis in Europe became clear.

[13] Bertaut, Kamin and Thomas (2009), projecting trends in the U.S. net international investment position, suggest that this process still has a considerable distance to run.

[14] Our own projections of the prospective widening of the U.S. current account deficit are in the second half of the paper.

[15] There is also the case of the UK, to which owing to its separate currency may be able to follow a separate strategy; we return to this below.

Europe as a whole not having been in large current account surplus or deficit, it is hard to argue that the continent played a major role in the build-up of global imbalances. [16] Where this pattern of intra-European imbalances clearly played a role was in the build-up of vulnerabilities within Europe (which, as we have already seen, will have implications for what happens going forward). With the decline in borrowing costs attendant on EMU, there was a large rise in consumption spending across Southern Europe.[17] In some countries (Spain) this was mainly private dissaving; in others (Greece, Portugal) government took an active part. Partly as a result of the concurrent shift to current account surplus in Germany, the resulting Southern European deficits were freely financed. The 2008-9 crisis was then the straw that broke the camel's back. Governments had no choice but to support demand with additional public spending, even while employment and export supply declined. The result was the growth of twin deficits, culminating in 2010 in fears of a region-wide sovereign debt crisis.

One consequence is the need now for significant fiscal consolidation across Southern Europe. Table 1 shows that planned reductions in 2010 range from 7.0 per cent of GDP in Greece to 3.0 per cent in Ireland and 2.5 per cent in Portugal and Spain. This will then be followed by somewhat smaller adjustments in the same direction in 2011 (except in Spain, where the projected fiscal adjustment is projected to increase). With not just public but also private spending likely to be weak, current account deficits will tend to narrow.

Were Southern Europe to swing sharply toward current account balance, that would increase the difficulty of engineering the same shift in the United States. In fact, the IMF expects the current account deficits across Southern Europe to shrink only gradually; Table 2 shows that of Greece falling only from 10 per cent of GDP in 2010 to the 7-8 per cent range thereafter, that of Italy falling by barely one per cent of GDP, that of Portugal falling not at all before 2012 and after that by only 1 percentage point of GDP, and that of Spain falling by barely a quarter of a percentage point of GDP. The assumption behind these April 2010 forecasts is presumably that private spending and growth will be maintained and that investment (the current account deficit being the excess of investment over saving) will not take a sustained hit.

These rosy forecasts may, however, have been called into question by subsequent events.[18] To reassure financial markets, governments have been compelled to adopt even larger discretionary cuts to their budgets. Uncertainty about implementation and about the prospects for European economic growth is likely to have a more powerful negative impact on private spending. With deeper recessions, current accounts will move toward balance more quickly. They will move not as a result of Southern European countries exporting more (the absence of a national exchange rate ruling out devaluation to jump-start exports, and the dependence of these economies of intra-European exports limiting the benefits of

[16] Of course, insofar as it was not net capital flows but gross capital flows – European banks taking risky positions in structured investment products associated with the growth of the subprime mortgage market in the United States being the flip-side of U.S. purchases of European securities – neither can the Europeans and their investments be exonerated of all blame for the crisis.

[17] See inter alia Jaumotte and Sodsriwiboon (2010).

[18] IMF (2010b) reports no change in projected year-on-year growth rates in 2010, and a reduction of 0.2 ppts in 2011.

euro depreciation) but as a result of their importing less. Deeper recessions and less spending on imports will mean less support for global rebalancing.

Measures to reduce uncertainty and otherwise limit the depth of the recessions associated with these necessary fiscal-consolidation measures would encourage investment. More investment would be helpful both for the countries in question and as a contribution to global rebalancing. This points to the importance of solidifying political support for fiscal consolidation where it is fragile. It means making the necessary consolidation as growth-friendly as possible, by relying more heavily on cuts to public expenditure rather than tax increases. It means relying more on cuts to current rather than capital expenditure (where the latter often proves temporary), and where tax increases are needed relying on less distortionary taxes (increases in VAT and sin taxes).[19] It means restructuring debts where they are unsustainable (in Greece). It means coming clean about the adequacy of the capitalization of European banks holding the debts that have to be restructured. It means supplementing fiscal consolidation with structural (labor-market and other regulatory) reform to address these economies' supply-side weaknesses and attract the foreign capital needed to finance current account deficits that will only be wound down slowly. It means reiterating the commitment of other European countries to temporarily provide this finance if markets fail. Alas, these seem like formidable perquisites for ensuring mild recessions and modest support from this region for global rebalancing.

Support from the euro surplus countries, Germany and its smaller compatriots the Netherlands, Austria and Finland, would make life for Southern Europe easier and also contribute to global rebalancing. The same Table 2 forecasts see the current account surplus of the dominant member of this group, Germany, remaining stable through 2011, the government doing little if any budget cutting until then (and the economy still feeling a positive discretionary impulse in 2010, reflecting the phased implementation of earlier stimulus measures), but shrinking by 1 per cent of its GDP by 2013 and another 1 per cent by 2015. Even then, however, German current account surpluses remain substantial. The euro now having fallen significantly, giving a further boost to German exports, one can reasonably ask whether this vision of a progressively narrowing German surplus is overly optimistic.[20]

This adjustment would be aided by measures that boosted German investment relative to saving. German commentators regularly bemoan the country's low rate of domestic investment, which is running only at 16 per cent of GDP, lower than in France, lower than in Italy, and lower than the euro zone average (19 per cent according to ECB data for 2010Q1). Investment tax credits can be used to encourage investment at home. Product market deregulation and the elimination of red tape can encourage investment in the underdeveloped service sector. These measures would be consistent with the pro-growth agenda of the German government and also contribute to global and intra-European rebalancing.

[19] This is the approach to which Greece has committed.
[20] We again offer our own projections of the German current account balance in the second half of the paper.

Operating on the savings side of the savings-investment imbalance would be harder. A constitutional amendment requiring the government to run a quasi balanced budget and a powerful collective psychology stand in the way of continued public dissaving in Germany. If policy initiatives to promote investment result in faster economic growth, this could lead to a temporary decline in saving and households spend more in anticipation of higher future incomes. But the experience of the last decade does not suggest that this mechanism works powerfully in Germany.

What about non-euro-zone Europe? In terms of global imbalances, this means mainly the United Kingdom. (Sweden, Denmark and Norway have been running surpluses, but they are small economies. In Eastern Europe, only the Southeastern European economies, which are even smaller, are now running substantial current account deficits.) The UK is running a current account deficit of 1.7 per cent of GDP, which the IMF foresees as shrinking only marginally. The question is whether that external deficit could now fall more sharply as a result of the deep budget cuts proposed by the new government, which could slow public spending, private investment and growth, and as a result of the weakness of sterling. That would not be helpful from the rebalancing point of view.

In sum, the picture in Europe is mixed because Europe is mixed. That there will be a substantial reduction in Southern Europe and possibly Great Britain's current account deficits seems fairly certain. Whether Germany and other countries will take up the slack is less clear.

China. Most of the attention devoted to China's high saving rate, which approaches 45 per cent of GDP and produces a very substantial current account surplus despite the country's high level of investment, focuses on household saving. Chinese households have good reason for precautionary saving. The structure of the economy is changing rapidly, with uncertain implications for their livelihoods. With the declining relative importance of state companies, the existing social safety net has been effectively downsized. There is limited scope for borrowing to pay for health care, education and other costs. Public support for retirees is similarly limited.[21]

The policy recommendations that flow from this analysis are familiar. China should develop its financial markets. It should develop its education, rural health care, and public pension systems. Those recommendations also have implications for global rebalancing. Building financial markets and a social safety net will take time; these are not institutional reforms that can be carried out in a few years. With the determinants of household savings rates changing only gradually, China's current account surplus will narrow only very gradually.[22] There may be hope for a contribution for global rebalancing in the medium term but not much in the short run.

[21] A more novel argument (Du and Wei 2010) is that the sex imbalance encourages saving by single men as a way of signaling their attractiveness as marriage partners.

[22] The view that gender imbalance contributes to Chinese saving similarly cautions against expecting much progress, since the gender ratio similarly only changes slowly with time.

In fact household savings rates in China have been declining in recent years, which makes it hard to blame them for the growth of the Chinese surplus.[23] They are not unusually high by the standards of other emerging markets. Savings as conventionally measured amount to only some 35 per cent of household income, which is not extraordinary. Moreover, household saving accounts for at most half of national saving. The other half is undertaken by enterprises and (until recently) government.

One explanation for the high level of corporate saving is that the strong performance of Chinese export has given export-oriented enterprises more profits than they can productively invest.[24] Some commentators move from this observation to the conclusion that the government should revalue the currency to reduce this profitability. This is an uncomfortable argument; it suggests that the authorities should want to make the leading sector of their economy less profitable and efficient – and especially that they would want to subject that sector to a sharp shock to profitability in the form of a step revaluation. From this point of view it is understandable that Chinese officialdom has been reluctant to see more than very gradual appreciation of the renminbi which, other things equal, would be unlikely to make more than a gradual impact on global imbalances.

On the other hand, if what we are seeing in the upsurge in labor unrest in 2010 and double digit wage increases, prominently at Foxconn and Honda but more broadly, is that previous policy amounted to an effort to artificially hold down the real exchange rate that is now abruptly unraveling, then there could be a more discontinuous adjustment. 20 per cent wage increases would not be unlike a 20 per cent revaluation in their effect on the competitiveness of exporters. If the upsurge in labor militancy is general, the impact on global imbalances could be significant.[25] Deutsche Bank (2010) uses a multi-sector computable general equilibrium model to estimate the impact of a 20 per cent wage increase, and concludes that this would raise consumption and investment by 3.9 per cent of domestic production (equivalently, net exports fall by 3.9 per cent of GDP). In other words, it would be enough to cut the Chinese surplus by about half.

But the high savings of Chinese enterprises is more than simply a matter of the real exchange rate. In addition, it likely reflects the underdevelopment of financial markets, as borrowing-constrained enterprises accumulate funds in anticipation of future investment needs.[26] Tyers and Lu (2009) suggest that also it reflects the market power and extraordinary profits of a handful of state-owned firms that dominate key industries like mining, petroleum refining, steel manufacture, and transport and communications. This is in contrast to textiles, footwear and processed agricultural products where private firms dominate, entry is relatively free, and rates of return on capital (profitability) have been lower.

[23] See Prasad (2009).
[24] Since 2008, some SOEs have been required to make limited dividend payments to their state owners, but this only adds to government savings (see below).
[25] See also Kroeber (2010).
[26] See Herd, Hill and Pigott (2010) for a status report on Chinese financial reform.

This diagnosis is not universally accepted.[27] If it is correct, then potential solutions include passing SOE dividend payments to the state on to consumers via a commensurate reduction in labor income taxes. They include using competition policy to encourage entry and reduce oligopoly rents. The government has embraced the practice of offsetting dividend receipts with reductions in labor taxes, although its dividend receipts remain limited. Entry, especially into heavy industry, sufficient to eliminate oligopoly profits is likely to take time, however.

An alternative in the meanwhile would be the imposition of price caps in sectors where market power is pervasive. This would be a step in the direction of the undistorted equilibrium. It would reduce corporate savings, other things equal. But other things would not be equal in practice. The excessive mark-ups associated with oligopoly power in China are concentrated in the sheltered sector. (This makes sense: exporters face the pressure of foreign competition.) Reducing the prices of the intermediate inputs they supply without reducing their quantity could end up making exports, of non-labor-intensive manufactures such as metals, motor vehicles and other manufactures, more competitive and offset, in part, the reduction in national saving and in the current account surplus. In any case, all these policies run up against the constraint that the SOE sector is a politically influential.

Finally, Green (2010) points to the contribution of government to national saving. 2009-10 was an exception; China rolled out a massive fiscal stimulus, the largest relative to GDP of any country, and the budget of the consolidated public sector swung into deficit in the amount of roughly 3 per cent of GDP. But this occurred against the backdrop of a steadily growing government budget surplus. Flow-of-funds data that are arguably superior to the official budget figures in that they capture off-budget sources of revenue, including those from land sales, show revenues of all levels of government as a share of national income as having risen by half, from 16 to 24 per cent, between 1994 and 2007, while spending failed to keep up. Green's data show government saving, inclusive of revenue from land sales, as contributing nearly half as much as either the household or corporate sectors to overall national saving.

While the government's contribution to national saving could presumably be adjusted more quickly than the nongovernmental component, there are limits. Spending on, inter alia, infrastructure would be difficult to ramp up further. The authorities are already making every effort to ramp up the rural health care system. They would like to fund three additional years of compulsory schooling, but training qualified teachers takes time. At the same time, it would be possible for the government to cut business taxes, on the underdeveloped service sector in particular. This would have the complementary effect of encouraging the reallocation of resources toward the production of nontraded goods, which would be helpful for global rebalancing.

The IMF sees the Chinese current account surplus as rising slightly, from 6.2 to 7.3 per cent of GDP by 2013 and then 8 per cent of GDP in 2015. While China avoids an external

[27] Ma and Yi (2010) question it on the grounds that market share and profits have been rising most rapidly not among state-owned firms but rather smaller, private enterprises.

surplus in excess of 10 per cent of GDP, the 2007-8 average, only in that sense does it contribute to global rebalancing. Significant rebalancing would require it to do more. The analysis here suggests that this could be achieved only through a broad combination of policies.[28]

Other East Asia. The recipe for moving Japan closer to current account balance is well known: ending deflation and restoring growth would encourage investment by firms anticipating higher prices and profits and consumption by households anticipating higher incomes. Reactions to the recent recession illustrate the point. In the 2009 downturn, the substantial reduction in the current account surplus that would have otherwise been brought about by the sizeable increase in the fiscal deficit (discretionary fiscal measures were some 1.4 per cent of GDP in 2009, and the total increase in the budget deficit amounted to 4.9 per cent of GDP) was offset by the increase in the household financial surplus of 2.8 per cent of GDP and increase in nonfinancial and financial corporations' financial surplus of another 2.8 per cent of GDP, as both households and firms cut back on their spending.[29]

Kawai and Takagi (2010) show that the trend in household savings rates was downward in the last decade, reflecting a rising old-age dependency ratio and predictable life-cycle effects. Most of the leverage for policy is thus likely to be in measures designed to stimulate corporate investment, not personal consumption. Getting spending going again is far from impossible, but it is something that the authorities have been attempting to do, without noticeable success, for the better part of two decades. Given the country's on-again-off-again fiscal stimulus and build-up of public debt, the scope for further fiscal measures is limited. Quantitative easing to push down the yen has never been particularly successful for whatever reason. By process of elimination, strong demand for Japanese capital goods and sophisticated intermediate inputs by China and other Emerging East Asia holds out the most promise for encouraging corporate investment. To encourage this, Kawai and Takagi (2010) recommend currency appreciation in China and elsewhere in the region together with active efforts to further liberalize intra-Asian trade.

Consistent with this view, Thorbecke (2010) finds that currency appreciation by non-China and non-Japan Asia would stimulate imports by developing Asian countries of both consumption and capital goods, from Japan and generally. Appreciation would likewise induce a significant reduction in exports to the United States. Labor-intensive exports would be affected most dramatically – making it important that when allowing their currencies to appreciate governments proactively take measures to stimulate labor-intensive employment elsewhere, namely in the service sector.[30] Encouraging investment in this sector would both hold out the potential for employment-rich growth and be a step toward correcting the saving-investment imbalance that shows up as chronic Emerging Asian current account surpluses. On the savings side, authors like Aziz and Lamberte

[28] Our own projections of the Chinese current account are in the second half of the paper.
[29] There was also a negative change in income account owing to a lower return on foreign investments, so the shift in the current account was not simply the sum of the change in the net financial positions of the three sectors.
[30] Note that these pieces do, in fact, fit together. Revaluation by emerging Asia against Japan and the other advanced economies implies an increase in exports by capital-abundant economies and a decline in those of their more labor-abundant counterparts.

(2010) recommend the same policy reforms as in China – building social safety nets and developing financial markets – although for countries like Indonesia, the Philippines and Thailand they don't hold out hope for progress sufficiently rapid to make a significant dent in imbalances.

Thorbecke also shows that the loss of exports by individual countries is less but the overall contribution to reducing global imbalances is greater when the countries of the region jointly appreciate their currencies. Moving together limits each individual Asian country's loss of competitiveness in the United States and other extra-Asian markets. In addition, joint appreciation would presumably be accompanied by measures to encourage consumption spending region wide, opening up additional export opportunities within Asia.

The other constraint on rebalancing in Emerging Asia, aside from concern with export, employment and overall economic growth, is reserve adequacy. Emerging Asian countries have run persistent current account deficits since 1997-8 partly in the desire to accumulate larger buffers of foreign exchange reserves, which they see as useful for insulating their economies from capital-flow volatility. There is the distinct possibility that they will conclude from the experience of 2008-9 that still larger reserve cushions are desirable. Supplements to national reserve holdings would therefore increase their willingness to contribute to rebalancing.

The alternatives here include establishment of an effective quick-disbursing, lightly-conditioned facility at the IMF, together with the willingness of Asian governments to access it; a network of currency swap lines and credits outside the IMF, as proposed by the Korean government in its capacity as G20 chair; and regional reserve pooling arrangements, which could perhaps operate in conjunction with the IMF. Of these three options, the third would appear most likely to be viable. Asian governments remain reluctant to approach the IMF, and the Fund's principal shareholders for their part would be reluctant to create a global system of currency swaps and credits that was tantamount to a shadow IMF. ASEAN+3 has made progress in strengthening and multilateralizing its Chiang Mai Initiative, which operates in conjunction with the IMF. The implication for policy is that the participants now need to show a readiness to actually use the mechanism. The implication for our empirical work is that reserve levels may be an important determinant of global imbalances, at least for certain countries and regions.

Oil Exporting Nations. In the focus on China's external surpluses, it is sometimes forgotten that in 2008, the combined current account balance of the oil exporting nations (Figure 1) exceeded that of China and Emerging East Asia. Then of course, in 2009 the oil exporters' surpluses fell precipitously from 1.08 to 0.34 per cent of world GDP. This volatility in their current account balances is largely, but not wholly, driven by the volatility in petroleum prices.

There is little that individual oil exporters can do to mitigate the wide variation in their current account balances. Furthermore, it makes sense for some of these countries to save a large proportion of increases in oil revenues due to price increases. [31] Hence,

[31] See IMF (2008), Box 6-1.

substantial responsibility for these movements in current account balances devolves upon the consuming nations, including the United States and China. The former is the largest single importer of oil (in 2009, oil imports accounted for 86 per cent of the total trade deficit), while in recent years China has contributed the largest increment to world oil imports. Small variations in demand conditions in these two countries, combined with relatively low price elasticities of supply and demand, explain a large share of the global imbalances in 2006-08.

The preceding suggests that a concerted effort to reduce the pace at which oil demand increases in both the United States and China would moderate global imbalances. Increasing the relative price of oil would thus have a positive impact on efforts to rebalance. The United States, with its relatively low taxes on energy, would be a prime candidate for progress here (Chinn, 2005).

Section 2. Empirics

In this section we estimate a simple analytical and forecasting model of current account balances. In doing so we build on the work of Chinn and Ito (2007). We include data for the crisis period, enabling us to ask whether the relationship between the current account and its proximate determinants changed around the time of that event. We use these and earlier data to conduct in- and out-of-sample forecasting exercises. In the course of this analysis we consider several familiar, not necessarily mutual exclusive, hypotheses and arguments that have been offered to explain global imbalances. These include the twin deficit hypothesis (Chinn 2005), the saving glut hypothesis (Greenspan, 2005a,b, Bernanke, 2005, and Clarida, 2005), and the asset bubble driven explanation of current account balances (Aizenman and Jinjarak, 2009; Fratzscher and Straub, 2009).

Following Chinn and Prasad (2003), Chinn and Ito (2007), and Ito and Chinn (2009), we will estimate the following models.

Model 1:

$$y_{i,t} = \alpha + \beta_1 BB_{i,t} + \beta_2 FD_{i,t} + X_{i,t}\Gamma + u_{i,t}$$

Model 2:

$$\begin{aligned} y_{i,t} = \alpha &+ \beta_1 BB_{i,t} + \beta_2 FD_{i,t} + \beta_3 LEGAL_i + \beta_3 KAOPEN_{i,t} \\ &+ \beta_4 \left(FD_{i,t} \times LEGAL_{i,t}\right) + \beta_5 \left(LEGAL_{i,t} \times KAOPEN_{i,t}\right) + \beta_6 \left(KAOPEN_{i,t} \times FD_{i,t}\right) \\ &+ X_{i,t}\Gamma + u_{i,t} \end{aligned}$$

$y_{i,t}$ refers to three dependent variables: the current account balance, national saving, and investment, all expressed as a share of GDP. *FD* is a measure of financial development, for which private credit creation (PCGDP) is usually used; *KAOPEN*, the Chinn-Ito (2006) measure of financial openness; and *LEGAL* a measure of legal/institutional development – the first principal component of law and order (LAO), bureaucratic quality (BQ), and anti-

corruption measures (*CORRUPT*).[32] $\boldsymbol{X}_{i,t}$ is a vector of macroeconomic and policy control variables that include familiar determinants current account balances such as net foreign assets as a ratio to GDP; relative income (to the U.S.); its quadratic term; relative dependency ratios on young and old population; terms of trade volatility; output growth rates; trade openness (= exports+imports/GDP); dummies for oil exporting countries; and time fixed effects.

Panels of non-overlapping 5-year averages are used for all explanatory variables except when noted otherwise. All variables, except for net foreign assets to GDP, are converted into the deviations from their GDP-weighted world mean prior to the calculation of five year averages – net foreign asset ratios are sampled from the first year of each five-year panel as the initial conditions.[33] The data are mostly extracted from publicly available datasets such as the *World Development Indicators*, *International Financial Statistics*, and *World Economic Outlook* (for details see Appendix 1).

The sample includes both industrial and developing countries. We use annual data for 23 industrial and 86 developing countries covering the four decades 1970-2008.[34] We regress current account balances, national saving, and investment on the same set of regressors seperatly for industrialized countries (IDC), developing countries (LDC) and emerging market economies (EMG).[35]

Table 3 shows the results for Model 1. Note first that these are consistent with the twin deficits hypothesis: budget surpluses and current account surpluses move together, other things equal. A coefficient of less than one suggests however that they move together less than proportionately.[36] Larger net foreign assets, which should generate a stronger income account, affect the current account balance positively, as anticipated. The relative income terms, which tend to be jointly if not always individuallly significant, show that higher income countries generally have stronger current accounts ("capital tends to flow from higher to lower income countries"). Countries with higher dependency ratios (and, by the life-cycle hypothesis, lower savings rates) generally have weaker current accounts.[37] Oil exporting countries have stronger current accounts, other things equal. All this is as expected.

The Caballero-Farhi-Gourinchas (2008) hypothesis that countries with more developed financial markets should have weaker currents accounts ("capital flows from

[32] *LAO*, *BQ*, and *CORRUPT* are extracted from the ICRG database. Higher values of these variables indicate better conditions.
[33] The variables for ToT volatility (*TOT*), trade openness (*OPN*), and legal development (*LEGAL*) are averaged for each country, i.e., they are time-invariant.
[34] The five year panels are 1971-75, 1976-1980, etc. However, the last panel is composed of only three years: 2006-08.
[35] The emerging market economies are defined as the economies classified as either emerging or frontier during 1980–1997 by the International Financial Corporation, plus Hong Kong and Singapore.
[36] These estimates are very similar to those in Abbas et al. (2010), who find that the elasticity of the current account balance with respect to the fiscal balance is on the order of 0.2-0.3. Erceg et al. (2005) also show their simulation results yield the coefficient of the budget balance to be around 0.20.
[37] Although this result does not show up for the industrial countries.

China, with its underdeveloped capital markets, to the United States, which has a comparative advantage in producing safe financial assets") finds weak support in the full sample (left-most column).[38] The pattern is the same but the significance of the effect vanishes when we disaggregate industrial and developing countries. This is perhaps not surprising, in that the hypothesis in question emphasizes flows between industrial and developing countries, not among members of the two subgroups.

Two dummy variables for the 2001-5 and 2006-8 subperiods look to the question of whether recent experience has been unusual. Emerging market economies appear to have run unusually large surpluses in the first subperiod, consistent with the idea that they were fixated on minimizing financing vulnerabilities and accumulating reserves following the Asian crisis. Such behavior is not evident for emerging markets as a group in 2006-8, when the contribution of emerging markets to global imbalances was increasingly a China story.[39] A surprise is that we see the industrial countries as a group running larger surpluses in the same 2001-5 period than their other characteristics would lead one to expect. Evidently the United States was an outlier in this respect.[40]

Table 4 then estimates the model for savings and investment separately. A few results of note are that government budget deficits affect primarily national saving (in the same direction as government saving, contrary to Ricardian equivalence stories), that dependency ratios affect both savings and investment (as emphasized in Eichengreen and Fifer 2002), and that financial development has a more consistent impact on investment than saving (something that would not be obvious a priori), A number of other variables that do not appear to have a significant impact on the current account balance in Table 3, such as growth, trade openness and terms-of-trade volatility, nonetheless affect both savings and investment significantly; they just affect them in the same direction.

Tables 5-6 add the institutional variables. (Here only the results for the current account balance in Table 5 are discussed.) The principal result of interest is the coefficient on the interaction between capital account openness and financial development (together with the financial-development effect discussed above). For the full sample, the results are again supportive of the Caballero et al. interpretation of global imbalances. Among emerging markets, those with better developed financial markets and open capital accounts similarly have weaker current account balances, as if they are on the receiving end of inflows (or experience the least tendency for capital to flow out). When we look only at the industrial countries, however, this pattern is no longer evident.

[38] The p-value is 15%.

[39] We can confirm this by adding a dummy variable for China in the post-2005 period. Its coefficient is positive and significant at the one per cent level, while the coefficient for emerging markets as a group in this subperiod continues to be zero.

[40] We can confirm this by adding a dummy variable for the U.S. in the 2001-5 subperiod; its coefficient is negative, and adding it does not eliminates the significant positive coefficient for 2001-5 in the industrial-country column. Not surprisingly, when we include all countries (in the left-most column), these period dummy variables are insignificant, since by definition current accounts should sum to zero.

A number of alternative specifications yielded very similar results. One of interest involved adding foreign reserves as a percent of GDP, lagged one five-year period, as an additional explanatory variable[41] Lagging the reserves variable is designed to address the concern that the current account balance and contemporaneous reserves are simultaneously determined (positive shocks to the current account will translate into positive shocks to reserves). Reserve-adequacy arguments suggest that, other things equal, larger reserves should mean less incentive for reserve accumulation and a weaker current account. For the industrial countries, the coefficient on this variable is negative and significant, as hypothesized. For emerging market economies, it is insignificant. For developing countries, it is positive and significant, contrary to the hypothesis.[42]

We now use these estimated relationships to construct out-of-sample projections as a way of forecasting the prospects for global rebalancing. We construct forecasts of the independent variables out to the 2011-15 period and use our estimates to project values for the current account. The forecasts start with 2011, omitting the crisis years 2009-10, when behavior was unusual.[43] The assumptions and the data for the out-of-sample projections are explained in Appendix 2.

For the United States the results, in Figure 5, suggest modest movement in the direction of rebalancing.[44] We see the same for the UK, whose deficit is projected to shrink over the 2011-15 period. However, the narrowing of current account deficits over the period is limited; substantial deficits remain even in 2015. The news for the surplus countries we consider – China, Japan, Germany, Singapore – is even less reassuring. The forecasts suggest that their surpluses will remain stable or rise further, absent additional policy changes. One interpretation is that the circle will be squared by other countries that will run smaller surpluses and offset America's smaller deficits. A less reassuring interpretation is that the parts don't add up under current forecasts and that even partial rebalancing will require further policy changes. Either way, it seems clear that imbalances will persist.

A number of further exercises can be undertaken on the basis of these forecasts. For example, we can use data only through 2005 to see how the model does in tracking current accounts in 2006-8 (Figure 6). In the figure, we observe that the extent of imbalances of major current account deficit (U.S. and U.K.) or surplus countries (Germany and China) in the 2006-08 period is beyond what can be predicted by the model using data up to 2005, signifying the pervasiveness of the global imbalances in the period. The 2011-15 forecasting also shows only modest rebalancing.

[41] Results not shown in the table.
[42] These estimates are based on model 2 including the institutional variables.
[43] We use model 2 (including the institutional variables) and the separate estimates for industrial and emerging-market economies as the basis for our forecasts.
[44] The confidence intervals are those of predictions, not those of forecasting. The predictions in 2011-15 are based on an assumption that the economy of concern faces the exact conditions as we assume in Appendix 2. Once the uncertainty of the explanatory variables in the period is incorporated, the confidence intervals can surely widen.

Both models persistently underpredict U.S. current account deficits, again suggesting that the U.S. is an outlier. In fact, when we re-estimate current account balances for the full sample including the dummy for the U.S., the coefficient on the country dummy is found to be significantly negative with a magnitude of -0.031 (model 1) to -0.036 (model 2). This is consistent with the view that the U.S. has some special characteristic allowing it to run persistent current account deficits of some 3 per cent of GDP, presumably as a result of its status as the issuer of the international vehicle currency.[45]

One of the big issues of macroeconomic management in coming years will be fiscal consolidation. The industrial countries will be required to reduce budget deficits without nipping the green shoots of recovery. How will global imbalances evolve under different fiscal scenarios? Figure 7 presents different out-of-sample predictions for U.S. current account balances in the 2011-15 period depending on the different scenarios about its budget balances – the baseline scenario based on the IMF WEO's projections (see Appendix 2), an optimistic scenario, and a pessimistic scenario. The optimistic scenario is the case in which the average of the U.S. budget balances for the 2011-15 period turns out to be higher than the average based on WEO projection (-6.5% of GDP) by three percentage points.[46] The pessimistic scenario is the case in which the 2011-15 average is lower than the WEO projection by three percentage points.

Figure 7 shows that a 3 percentage point difference in the fiscal balance relative to the baseline scenario would change the current account balance by half a percentage point, suggesting that rebalancing cannot be accomplished through fiscal policy alone. If the shrinkage of budget deficits is coupled with overall economic recovery and consequent recovery in the financial markets, as in the optimistic scenario, this would in fact slightly drag down projected current account balances.[47]

We can similarly consider alternative scenarios for financial development and capital account liberalization in China (Figure 8). Panel A shows, for comparison, the same projection as in Figure 5. Panel B then shows the forecast if China's level of financial openness increases moderately to the level of Thailand in 2008. In this case the current account surplus falls significantly, in line with the predictions of the proponents of the saving glut argument. Panels C and D show what happens when financial liberalization proceeds to Brazilian and then Mexican levels.[48] Again, this leads to further declines in the current account surplus. Thus, financial liberalization may lead to an increase in net capital inflows and thereby to a deterioration of current account balances.[49]

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[45] See Gourinchas and Rey (2007).

[46] Three percentage points are equivalent to 1.5 standard deviations in the distribution of U.S. budget balances in the 1969 – 2008 period.

[47] Consistent with the Caballero et al. effect.

[48] The countries are ranked as Mexico (69.2 in the 100 scale), Brazil (58.8), Thailand (40.3), and China (16.1) in terms of the level of finanial openness as of 2008. The average of KAOPEN for the LDC group as of 2008 is 50.2 whereras that for the EMG group is 60.9.

[49] If capital account opening occurs while exchange rates are allowed to adjust more flexibly, the current account balance could also deteriorate through the price channel. Before the policy change of increasing the flexibility of the renminbi on June 19, 2010, it had been argued that one of the reasons for Chinese hesitation to allow greater

Figure 9 makes alternative assumptions about financial development. Recall that this is measured by the average ratio of domestic credit to GDP, which fell, relative to the world average, between 2001-5 and 2006-8.[50] A modest assumption about Chinese financial development over the next five years is that this ratio returns to its 2001-5 levels. If we place this assumption with Mexican levels of financial openness, this is enough to eliminate China's surplus. As a caution, note that the model, based on average behavior in a cross-section of emerging markets, under-predicts the Chinese surplus in recent years. That the surplus *disappears* in 2015 under this scenario is at least as much an artifact of this underprediction as it is a consequence of the financial liberalization and development. But the point remains: how quickly China narrows its surplus will be a function in part, of how much progress it makes in financial liberalization and development. Furthermore, given that the return of PCGDP to the 2001-05 level alone (Panel B of Fig. 9) hardly changes the predicted current account level, and that the predicted level declines only when financial development is coupled with financial liberalization, we surmise that financial liberalization would be more effective than financial development in reducing China's current account surplus.[51]

Section 3. Living with Imbalances over the Transition

We take the view that large flows of capital across borders can both cause and be influenced by excessive risk taking and leverage. Had American current account deficits only resulted in a consumption binge in both the private and public sectors, then the crisis of 2007-09 would have been more manageable. However, excessively large capital flows induced a search for yield that made the financial sector extremely vulnerable to movements in asset prices. But the lack of regulation, and heady optimism surrounding financial innovation, also pulled capital into the United States. This synergy means that it is futile to ascribe all the blame to global imbalances; but it would also be unwise to ignore the return of widening imbalances, exactly because none of the causes have thus far been addressed, either nationally or globally.

Our out-of-sample forecasts suggest that global imbalances are likely to wind down only very gradually. Intuitively, many of the policies that are their determinants, such as government budget balances, are themselves likely to adjust only gradually, discontinuous adjustments being painful and difficult. That adjustment will be gradual is even more obvious of the structural determinants of current account balances, from relative per capita incomes to dependency ratios and levels of financial development. With time, these variables will tend to converge across countries, in turn creating a tendency for imbalances

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exchange rate flexibility is that policy makers in Beijing are worried that financial liberalization may lead to further capital inflows, reinforcing the upward pressure on the currency.

[50] Recall that in our empirical model all variables are normalized by the world average.

[51] This conclusion relies upon our proxy of financial development, the ratio of private credit creation to GDP, accurately representing financial development. It would be preferable to use a broader measure of financial development, such as the composite bond/equity/bank indicators used in Ito and Chinn (2009), but the data are not yet available for that exercise.

to shrink. But their movement is likely to be limited and hence to have limited impact in the short run.

The immediate task is thus to make the world safe for global imbalances. It is to prevent the resumption and maintenance of growth from being derailed by continued imbalances. This points to the need for a concrete set of policy actions.

First, to the extent that global imbalances contributed to financial excesses, it is important to redouble efforts at regulatory reform: to strengthen supervision and correct incentive problems in financial markets. Analysts disagree about whether or not global imbalances were a central cause of the crisis, but there is no disagreement that they poured additional fuel on the flames. To say that crises like the one we have recently experienced are disruptive to growth and should therefore be avoided is to put an understated gloss on the point. We do not subscribe to the idea that financial markets have learned their lesson and that, as the U.S. current account deficit widens out again and more capital flows toward the United States, there is no danger that this capital will not be used to finance dangerously speculative transactions. History suggests that financial market participants have short memories.

Individual countries are moving forward with their reform efforts. The U.S. Congress has passed and President Obama has signed a financial reform bill, for example. But a number of aspects of financial reform will be effective only if coordinated internationally. Here much more needs to be done. It is uncertain whether the Basel Committee's negotiations on revising capital and liquidity ratios will be successfully completed this year, and there is talk of significant delay in phasing them in. This, in our view, would be a mistake. There is the absence of progress on a global resolution regime for financial conglomerates whose operations extend across borders. If imbalances persist and contribute to the recovery of leverage in financial markets to earlier levels, the threat to growth would be very real.

This means not just strengthening the regulatory regime but also applying it more countercyclically. A lesson of the crisis is that regulators have to do more to raise capital and liquidity requirements when large amounts of foreign capital are financing large current account imbalances. This is when banks, seeing their capitalization rising, will most aggressively expand their balance sheets. Once upon a time the Bank of Spain was praised for having responded to these dynamics with countercyclcial provisioning. We now know that its response, however admirable in principle, was inadequate in practice.

Countries where foreign finance is denominated in foreign currency should also be attentive to the mismatch problem. Hungary, which ran substantial current account deficits in the first half of the decade, now sees them causing serious problems for growth because the foreign finance for those deficits was in euros and Swiss francs; this created difficulties when the forint weakened against the two Western European currencies. The Hungarian authorities have now promulgated regulations limiting foreign currency denominated

borrowing by the corporate and household sectors, but the horse is long since out of the barn. [52]

Similarly, central banks should now take greater account of imbalances and asset prices in the formulation of monetary policy. The old conventional wisdom was that imbalances were relevant to the setting of policy rates only insofar as they had implications for the output gap and expected inflation. The new conventional wisdom is that growth can be disrupted if external deficits are allowed to create systemic financial vulnerabilities or apt to be compressed suddenly. Central banks need to think of themselves not just as inflation targeters but also as macro-prudential supervisors, given that other supervisors are not always up to the task.[53] This is likely to mean using monetary policy to lean harder against the early signs of asset bubbles associated with persistent imbalances.[54]

Recent experience also makes clear the importance of adjusting fiscal policy more proactively. In this case the new conventional wisdom is the same as the old conventional wisdom: as current account deficits widen and capital inflows rise, it is important for the fiscal authorities to tighten, again in order to prevent threats to financial stability and growth from building up. This is a lesson that emerging markets in Asia and Latin America learned from their earlier crises.[55]

One concrete step to make fiscal policy more proactive is to recognize that for the advanced economies it is urgent to run a fiscal policy which sets the cyclically adjusted budget balance near zero over the medium term. That calculation should include contingent liabilities as well; as resources become tighter, governments will be tempted to stimulate the economy by using guarantees for loans, or for pensions.

Finally, the preceding analysis suggests that countries should redouble their efforts to speed the correction of global imbalances. This is in the interest of surplus as well as deficit countries, and fast- as well as slow-growing economies, insofar as the risks to financial stability that could flow from the reemergence of imbalances may prove more disruptive to economic performance in the fast-growing surplus countries next time. Coordinated fiscal action is one obvious way of hastening the adjustment: the countries with large current account surpluses, Germany and China for example, can expand while those with large deficits and questionable prospects for financing them, in Southern Europe

[52] Korea has responded to the problem created for its financial system by the sudden shortage of dollar liquidity in 2008-9 by adopting regulations designed to prevent banks from again borrowing offshore in dollars excessively that limit their ability to hedge that exposure in forward markets. Whether limiting the ability of banks to hedge foreign exposures is really the best way of discouraging them from incurring those exposures in the first place is an open question.

[53] And that, when things go wrong, it is the central bank that will be forced to make them good.

[54] Exactly how central banks should modify their targeting behavior remains one of those questions "for future research." Intuitively, it might make sense for include not just core inflation or headline inflation but also asset market inflation in their post-Taylor rule, with a weight on the new variable that increases with instability risk. More realistically, this is an argument for central banks relying less on simple targeting rules and formulae, which are conducive to worrying about "normal disturbances" and lend themselves to neglecting structural changes and tail risks.

[55] It would have been the appropriate response in the Baltics and in Southern Europe in the course of the last decade.

in particular, consolidate; if coordinated, these adjustments can help correct global imbalances while continuing to support global demand.[56] As these and related measures are taken, there will have to be adjustments in either relative inflation rates or exchange rates to clear markets.[57] Herein lies the case for more currency flexibility in China as a concommitant of other policies to speed the correction of imbalances.

The chronic surpluses of emerging markets also reflect the demand for still greater foreign exchange reserves as insurance against financial volatility. This suggests that the other policies suggested in this section to reduce volatility could also have a payoff in terms of correcting imbalances insofar as they also limit the appetite for reserves. In addition, regional reserve-pooling arrangements, the institutionalization of bilateral swap lines and credits, and the creation of a quick-disbursing, lightly-conditioned facility at the IMF that emerging markets would finally feel comfortable about accessing would help to further moderate this appetite. This is addressed in the G20 agenda for strengthening the international financial architecture. The success of these efforts is important, therefore, both to accelerate the correction of global imbalances and to make the world safe for growth in the meantime.

[56] Where the United States fits in this equation is not so clear. The desire to speed the correction of global imbalances suggests faster budget deficit cutting, but the need to support global demand and the still-low interest rates that suggest the existence of fiscal space suggest instead further fiscal stimulus to support global demand.
[57] As discussed in Section 1 above.

Appendix 1. Data

We provide below a listing of the mnemonics for the variables used in the analysis, descriptions of these variables and the source(s) from which the primary data for constructing these variables were taken.

Mnemonic	Source*	Variable description
CAGDP	WDI, WEO	Current account to GDP ratio
NSGDP	WDI, WEO	National saving to GDP ratio
KFGDP	WDI, WEO	Capital formation to GDP ratio
GOVBGDP	WDI, IFS, WEO	General government budget balance, ratio to GDP
NFAGDP	LM	Stock of net foreign assets, ratio to GDP
RELY	PWT	Relative per capita income, adjusted by PPP exchange rates, Measured relative to the U.S., range (0 to 1)
RELDEPY	WDI	Youth dependency ratio (relative to mean across all countries), Population under 15 / Population between 15 and 65
RELDEPO	WDI	Old dependency ratio (relative to mean across all countries), Population over 65 / Population between 15 and 65
YGRAVG	WDI	Average real GDP growth
TOT	WDI	Terms of trade
OPEN	WDI	Openness indicator: ratio of exports plus imports of goods and nonfactor services to GDP
PCGDP	WBFS	Banking development, ratio of private credit to GDP
KAOPEN	CI	Capital account openness
BQ	ICRG	Quality of Bureaucracy
LAO	ICRG	Law and order
CORRUPT	ICRG	Corruption index
LEGAL	Authors' calculations	General level of legal development, first principal component of BQ, LAO, and CORRUPT.
IR	WDI	International reserves as a ratio (excluding gold) to GDP

* These are mnemonics for the sources used to construct the corresponding. CI: Chinn and Ito (2006); DPI2004: ICRG: *International Country Risk Guide*; IFS: IMF's *International Financial Statistics*; LM: Lane and Milesi-Ferretti (2006); OECD: *OECD Economic Outlook*

Database; PWT: *Penn World Table* 6.4; WBFS: World Bank Financial Structure Database; WDI: *World Development Indicators*; and WEO: *World Economic Outlook*.

Appendix 2: Assumptions of Out-of-sample Forecasting Exercise

Variables	Assumptions
Government budget balance	World Economic Outlook projections (WEO, April 2010) are used. In the WEO, the budget balances data and their projections are available only for 33 countries. However, the sum of output (in US$) for these countries account for 85-90% of total world output. Hence, the 33 countries' data are used to calculate the world-weighted average. The data are also used for U.S. projections. China's budget balance data are not available. We assumed the 2011-05 average of budget balances will be -2%, a reasonable assumption given information in other sources.
Net foreign assets (initial)	The level of net foreign assets is assumed to remain the same as of 2004 (the last year for which data are available).
Relative income	The relative income series (originally based on Penn World Tables) is extrapolated using the growth rates calculated based on the WEO's series of per capita income in international PPP.
Youth and Old dependency ratios	Forecasts from the UN World Population Prospects Database are used.
Financial Develop. (PCGDP)	This is a difficult variable to project. The global crisis must surely have made private credit creation smaller for many countries, but this may not be the case for some (e.g., China). Also, GDP, the denominator for this variable, shrunk for many countries, which can make the variable PCGDP relatively stable even for countries whose private credit also shrunk. We use the average of the variable (though as deviations from the world weighted averages) during the 2001-08 period. For China we consider a range of alternative assumptions.
Legal development (LEGAL)	We assume no change.
Financial openness (KAOPEN)	For the U.S., U.K., Germany, Japan, and Rep. of Korea, we assume that the level of KAOPEN as of 2011-15 to remain the same as in 2008. For China, we consider a range of alternative assumptions.
TOT volatility	We assume no change.

Average GDP growth	We use the data from the World Economic Outlook, April 2010.
Trade openness	We assume no change
Dummy for 2011-15	Since we have no estimated coefficient on the dummy for the 2011-15 period, we use the average of the time fixed-effects for the other previous panels.

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Table 1. Fiscal Adjustment in Europe

	Proportion of Euro-area GDP	Discretionary budget cuts, % of GDP	
	2009	**2010**	**2011**
France	21.40	0.00	0.6
Germany	26.80	1.50	0.4
Greece	2.60	7.00	4.0
Ireland	1.80	3.00	2.0
Italy	16.90	0.50	0.8
Portugal	1.80	2.50	3.1
Spain	11.70	2.50	2.9
Others	16.90	0.40	0.5
Euro area	**100.00**	**0.20**	**1.0**

Source: Economist Magazine, drawing on Barclay's Capital.

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Table 2. Actual and Projected Current Account Balances (as % of GDP)

Country	2008	2009	2010	2011	2012	2013	2014	2015
Austria	3.484	1.396	1.774	1.669	1.601	1.712	1.783	1.910
Belgium	-2.539	-0.267	-0.474	-0.124	0.421	1.085	1.641	2.176
Cyprus	-17.666	-9.345	-11.428	-10.928	-10.968	-10.982	-10.989	-10.962
Finland	3.022	1.384	2.018	1.843	1.790	1.829	1.863	1.895
France	-2.260	-1.451	-1.927	-1.849	-1.638	-1.389	-1.140	-0.884
Germany	6.690	4.791	5.458	5.597	4.870	4.479	4.097	3.577
Greece	-14.552	-11.217	-9.685	-8.090	-7.528	-7.366	-7.263	-7.289
Ireland	-5.189	-2.944	0.393	-0.084	-0.042	-0.176	-0.434	-0.726
Italy	-3.418	-3.365	-2.793	-2.678	-2.597	-2.490	-2.469	-2.374
Luxembourg	5.338	5.735	11.234	11.587	12.045	12.506	12.940	13.305
Malta	-5.399	-3.892	-5.070	-5.098	-4.696	-4.253	4.440	-4.458
Netherlands	4.787	5.241	5.000	5.300	5.488	5.321	5.154	4.973
Portugal	-12.115	-10.057	-8.976	-10.165	-9.769	-9.421	-9.125	-8.885
Slovak Republic	-6.530	-3.195	-1.789	-1.902	-1.785	-2.019	-2.383	-2.734
Slovenia	-6.157	-0.295	-1.516	-1.201	-0.564	0.126	1.053	1.848
Spain	-9.592	-5.064	-5.267	-5.094	-5.033	-4.999	-4.985	-4.977

Notes: Figures for 2010-2015 are IMF staff projections.

Table 3. Current Account Regression WITHOUT Institutional Variables

	Current Account			
	(1) Full	(2) Industrial Countries (IDC)	(3) Less Developed (LDC)	(4) EMG
Government budget balance	0.283	0.414	0.28	0.119
	[0.064]***	[0.086]***	[0.068]***	[0.065]*
Net foreign assets (initial)	0.039	0.089	0.029	0.024
	[0.006]***	[0.014]***	[0.007]***	[0.013]*
Relative income	0.058	0.023	0.097	0.241
	[0.015]***	[0.017]	[0.020]***	[0.092]***
Relative income squared	0.073	-0.104	0.073	0.161
	[0.019]***	[0.082]	[0.018]***	[0.083]*
Dependency ratio (young)	-0.046	0.012	-0.034	-0.02
	[0.015]***	[0.023]	[0.017]**	[0.018]
Dependency ratio (old)	-0.025	0.013	-0.025	-0.054
	[0.009]***	[0.017]	[0.011]**	[0.019]***
Financial Develop. (PCGDP)	-0.016	-0.025	0.013	-0.008
	[0.011]	[0.016]	[0.013]	[0.016]
TOT volatility	0.007	-0.1	-0.009	-0.003
	[0.020]	[0.053]*	[0.022]	[0.024]
Avg. GDP growth	-0.184	0.056	-0.209	0.028
	[0.121]	[0.173]	[0.132]	[0.121]
Trade openness	-0.001	-0.013	-0.014	-0.018
	[0.006]	[0.013]	[0.008]*	[0.010]*
Oil exporting countries	0.034	–	0.033	0.057
	[0.013]***	–	[0.013]***	[0.016]***
Dummy for 2001-05	0.014	0.023	0.018	0.04
	[0.011]	[0.010]**	[0.018]	[0.017]**
Dummy for 2006-08	0.007	0.01	0.016	0.023
	[0.013]	[0.011]	[0.020]	[0.021]
Observations	670	180	490	256
Adjusted R-squared	0.45	0.5	0.47	0.42

Note: Time fixed effects are included in the estimation, but only those for the 2001-05 and 2006-08 periods are reported in the table.

Table 4. National Saving and Investment Regression WITHOUT Institutional Variables

	National Saving				Investment			
	(5) Full	(6) Industrial Countries (IDC)	(7) Less Developed (LDC)	(8) EMG	(9) Full	(10) Industrial Countries (IDC)	(11) Less Developed (LDC)	(12) EMG
Government budget balance	0.411	0.582	0.413	0.246	0.033	0.139	0.028	0.026
	[0.111]***	[0.081]***	[0.113]***	[0.078]***	[0.035]	[0.060]**	[0.036]	[0.064]
Net foreign assets (initial)	0.024	0.078	0.015	0.053	-0.006	-0.008	-0.005	0.014
	[0.013]*	[0.011]***	[0.014]	[0.016]***	[0.004]	[0.007]	[0.005]	[0.013]
Relative income	-0.007	0.003	0.025	-0.07	-0.043	-0.042	-0.043	-0.268
	[0.033]	[0.021]	[0.038]	[0.096]	[0.014]***	[0.021]*	[0.019]**	[0.067]***
Relative income squared	0.048	-0.17	0.065	-0.174	-0.009	-0.001	0.004	-0.316
	[0.042]	[0.093]*	[0.033]**	[0.101]*	[0.019]	[0.093]	[0.019]	[0.066]***
Dependency ratio (young)	-0.091	-0.066	-0.055	-0.038	-0.054	-0.094	-0.033	-0.037
	[0.018]***	[0.023]***	[0.020]***	[0.019]**	[0.012]***	[0.022]***	[0.014]**	[0.018]**
Dependency ratio (old)	-0.03	-0.042	-0.01	-0.062	-0.006	-0.046	0.011	-0.007
	[0.014]**	[0.017]**	[0.016]	[0.018]***	[0.009]	[0.017]***	[0.010]	[0.017]
Financial Develop. (PCGDP)	0.031	0.000	0.1	0.031	0.033	0.019	0.061	0.042
	[0.016]**	[0.012]	[0.026]***	[0.024]	[0.008]***	[0.007]***	[0.014]***	[0.016]***
TOT volatility	-0.009	0.243	-0.058	-0.08	0.026	0.335	-0.002	-0.03
	[0.038]	[0.060]***	[0.043]	[0.033]**	[0.020]	[0.054]***	[0.022]	[0.030]
Avg. GDP growth	0.593	0.193	0.547	1.071	0.908	0.397	0.9	1.134
	[0.173]***	[0.217]	[0.179]***	[0.161]***	[0.098]***	[0.302]	[0.101]***	[0.122]***
Trade openness	0.024	0.029	0.011	0.01	0.021	0.029	0.022	0.027
	[0.007]***	[0.016]*	[0.009]	[0.011]	[0.005]***	[0.011]***	[0.007]***	[0.008]***
Oil exporting countries	0.079	–	0.088	0.053	0.046	–	0.053	0.017
	[0.018]***	–	[0.019]***	[0.015]***	[0.012]***	–	[0.011]***	[0.015]
Dummy for 2001-05	-0.015	-0.059	0.047	0.047	-0.034	-0.09	0.019	-0.003
	[0.011]	[0.011]***	[0.016]***	[0.019]**	[0.014]**	[0.019]***	[0.014]	[0.018]
Dummy for 2006-08	0.007	-0.052	0.082	0.054	-0.017	-0.07	0.039	0.019
	[0.014]	[0.012]***	[0.021]***	[0.026]**	[0.014]	[0.018]***	[0.015]**	[0.019]
Observations	670	180	490	256	670	180	490	256
Adjusted R-squared	0.44	0.61	0.47	0.55	0.32	0.43	0.37	0.49

Note: Time fixed effects are included in the estimation, but only those for the 2001-05 and 2006-08 periods are reported in the table.

Table 5. Current Account Regression with Institutional Variables

	Current Account			
	(1) Full	(2) Industrial Countries (IDC)	(3) Less Developed (LDC)	(4) EMG
Government budget balance	0.295	0.289	0.278	0.09
	[0.058]***	[0.086]***	[0.063]***	[0.055]*
Net foreign assets (initial)	0.037	0.078	0.028	0.028
	[0.006]***	[0.008]***	[0.007]***	[0.012]**
Relative income	0.09	0.018	0.135	0.302
	[0.018]***	[0.022]	[0.022]***	[0.096]***
Relative income squared	0.056	0.02	0.048	0.182
	[0.018]***	[0.094]	[0.017]***	[0.085]**
Dependency ratio (young)	-0.033	0.004	-0.029	-0.03
	[0.015]**	[0.025]	[0.017]*	[0.019]
Dependency ratio (old)	-0.018	0.057	-0.021	-0.068
	[0.010]*	[0.021]***	[0.011]**	[0.020]***
Financial Develop. (PCGDP)	-0.027	-0.02	0.002	-0.117
	[0.014]*	[0.010]*	[0.029]	[0.038]***
Legal development (LEGAL)	-0.009	0.015	-0.015	-0.019
	[0.005]*	[0.005]***	[0.007]**	[0.012]
PCGDP x LEGAL	-0.011	-0.014	-0.007	-0.033
	[0.008]	[0.012]	[0.008]	[0.014]**
Financial open. (KAOPEN)	0.002	0.008	-0.008	-0.008
	[0.005]	[0.004]*	[0.008]	[0.009]
KAOPEN x LEGAL	0.003	0.012	-0.001	0.003
	[0.001]***	[0.003]***	[0.002]	[0.003]
KAOPEN x PCGDP	0.002	0.028	0.003	-0.019
	[0.007]	[0.010]***	[0.008]	[0.010]*
TOT volatility	0.001	0.028	-0.01	0.025
	[0.023]	[0.047]	[0.024]	[0.025]
Avg. GDP growth	-0.097	0.178	-0.092	0.067
	[0.091]	[0.178]	[0.099]	[0.116]
Trade openness	-0.001	-0.001	-0.005	0
	[0.006]	[0.011]	[0.010]	[0.012]
Oil exporting countries	0.028	–	0.025	0.045
	[0.013]**	–	[0.012]**	[0.016]***
Dummy for 2001-05	0.025	0.015	0.034	0.041
	[0.009]***	[0.009]*	[0.015]**	[0.017]**
Dummy for 2006-08	0.017	0.002	0.033	0.021
	[0.011]	[0.010]	[0.018]*	[0.022]
Observations	620	174	446	249
Adjusted R-squared	0.49	0.63	0.52	0.45

Note: Time fixed effects are included in the estimation, but only those for the 2001-05 and 2006-08 periods are reported in the table.

Table 6. National Saving and Investment Regression with Institutional Variables

	National Saving				Investment			
	(5) Full	(6) Industrial Countries (IDC)	(7) Less Developed (LDC)	(8) EMG	(9) Full	(10) Industrial Countries (IDC)	(11) Less Developed (LDC)	(12) EMG
Government budget balance	0.43	0.476	0.417	0.192	0.032	0.304	0.021	-0.014
	[0.113]***	[0.087]***	[0.123]***	[0.071]***	[0.034]	[0.126]**	[0.033]	[0.061]
Net foreign assets (initial)	0.023	0.072	0.019	0.057	-0.007	-0.014	-0.002	0.013
	[0.014]	[0.008]***	[0.015]	[0.015]***	[0.004]	[0.010]	[0.005]	[0.014]
Relative income	0.015	0	0.035	-0.017	-0.037	-0.006	-0.051	-0.252
	[0.034]	[0.027]	[0.043]	[0.088]	[0.018]**	[0.032]	[0.021]**	[0.076]***
Relative income squared	0.057	-0.176	0.068	-0.191	0.002	-0.225	0.022	-0.326
	[0.034]*	[0.116]	[0.029]**	[0.092]**	[0.018]	[0.155]	[0.017]	[0.073]***
Dependency ratio (young)	-0.06	-0.088	-0.035	-0.058	-0.05	-0.097	-0.032	-0.046
	[0.018]***	[0.025]***	[0.022]	[0.020]***	[0.013]***	[0.026]***	[0.015]**	[0.018]**
Dependency ratio (old)	-0.017	-0.017	-0.004	-0.082	-0.005	-0.058	0.007	-0.013
	[0.015]	[0.021]	[0.017]	[0.020]***	[0.009]	[0.020]***	[0.010]	[0.019]
Financial Develop. (PCGDP)	0.02	0.017	0.08	-0.092	0.037	0.026	0.078	0.046
	[0.017]	[0.011]	[0.059]	[0.053]*	[0.008]***	[0.012]**	[0.031]**	[0.043]
Legal development (LEGAL)	-0.012	0.011	-0.018	-0.037	-0.002	-0.01	0.008	-0.016
	[0.007]*	[0.006]*	[0.012]	[0.015]**	[0.004]	[0.006]*	[0.008]	[0.014]
PCGDP x LEGAL	-0.021	-0.028	-0.015	-0.047	0	-0.003	0.014	0.000
	[0.008]**	[0.013]**	[0.014]	[0.018]**	[0.004]	[0.012]	[0.010]	[0.015]
Financial open. (KAOPEN)	-0.004	-0.004	-0.012	-0.002	-0.011	-0.01	-0.015	-0.006
	[0.006]	[0.005]	[0.012]	[0.010]	[0.003]***	[0.003]***	[0.006]**	[0.007]
KAOPEN x LEGAL	-0.002	0.01	-0.006	0.003	-0.003	0.003	-0.005	-0.004
	[0.001]	[0.003]***	[0.004]	[0.004]	[0.001]***	[0.005]	[0.002]**	[0.003]
KAOPEN x PCGDP	0.008	0.009	0.014	-0.01	-0.001	-0.003	-0.002	0.003
	[0.009]	[0.011]	[0.014]	[0.014]	[0.005]	[0.011]	[0.008]	[0.012]
TOT volatility	-0.023	0.314	-0.051	-0.062	0.018	0.252	-0.003	-0.051
	[0.039]	[0.053]***	[0.045]	[0.035]*	[0.022]	[0.045]***	[0.025]	[0.031]*
Avg. GDP growth	0.692	0.417	0.689	1.118	0.951	0.38	0.94	1.139
	[0.166]***	[0.252]	[0.190]***	[0.168]***	[0.094]***	[0.268]	[0.097]***	[0.127]***
Trade openness	0.023	0.033	0.025	0.033	0.021	0.023	0.026	0.035
	[0.007]***	[0.016]**	[0.013]*	[0.012]***	[0.005]***	[0.012]*	[0.008]***	[0.009]***
Oil exporting countries	0.078	–	0.086	0.032	0.049	–	0.059	0.01
	[0.018]***	–	[0.020]***	[0.017]*	[0.012]***	–	[0.011]***	[0.014]
Dummy for 2001-05	0.007	-0.053	0.064	0.049	-0.028	-0.08	0.013	-0.004
	[0.013]	[0.012]***	[0.017]***	[0.020]**	[0.014]*	[0.021]***	[0.014]	[0.018]
Dummy for 2006-08	0.029	-0.041	0.102	0.049	-0.009	-0.058	0.034	0.015
	[0.015]*	[0.012]***	[0.022]***	[0.026]*	[0.015]	[0.020]***	[0.016]**	[0.020]
Observations	620	174	446	249	620	174	446	249
Adjusted R-squared	0.46	0.63	0.49	0.57	0.36	0.46	0.40	0.5

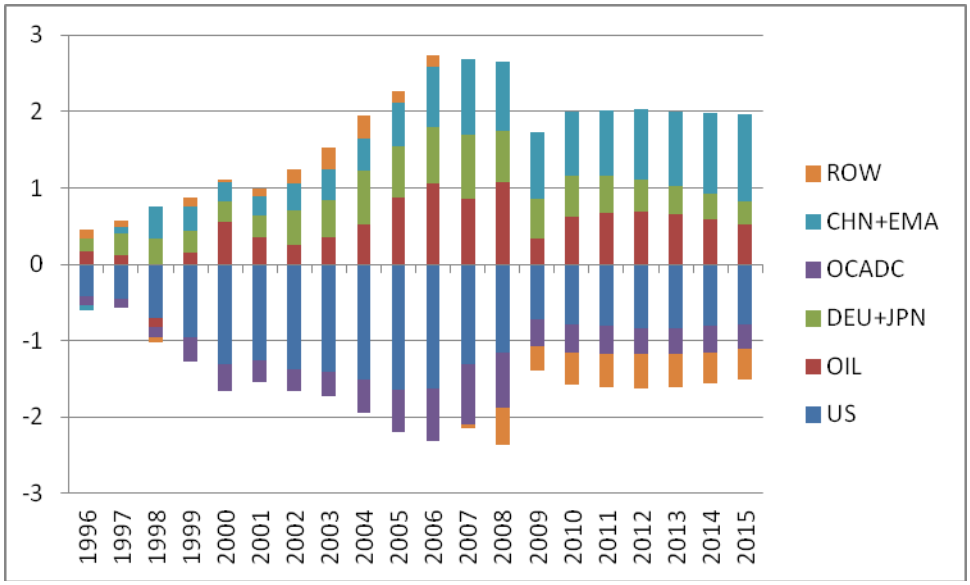
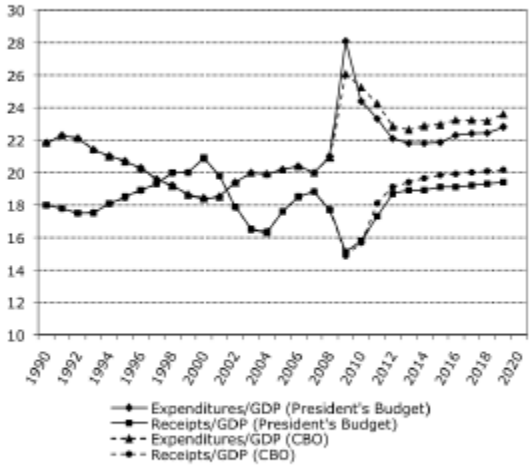


Figure 1: Current account balances as a share of world GDP. 2009-2015 data are IMF projections. US is United States, OIL is oil exporting countries, DEU+JPN is Germany plus Japan, OCADC is other advanced developed countries, CHN+EMA is China plus other emerging Asia, and ROW is rest of the world. Source: IMF, *World Economic Outlook*, April 2010.

Figure 2: Federal Expenditures and Revenues
(percent of GDP)



Sources: Office of Management and Budget (White House) and Congressional Budget Office

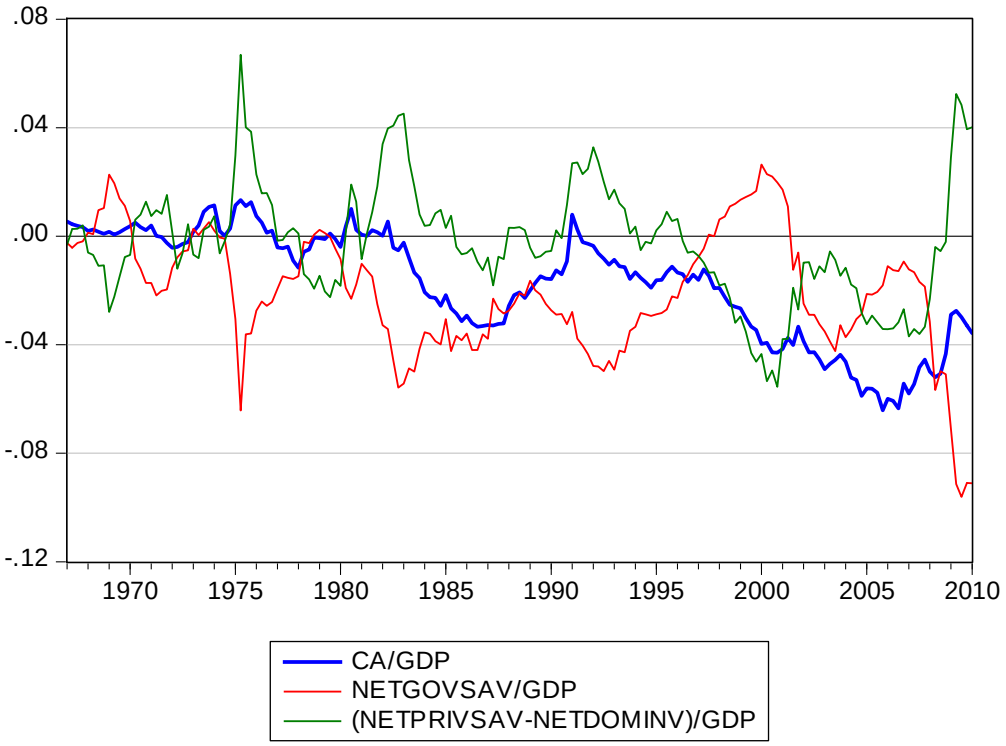
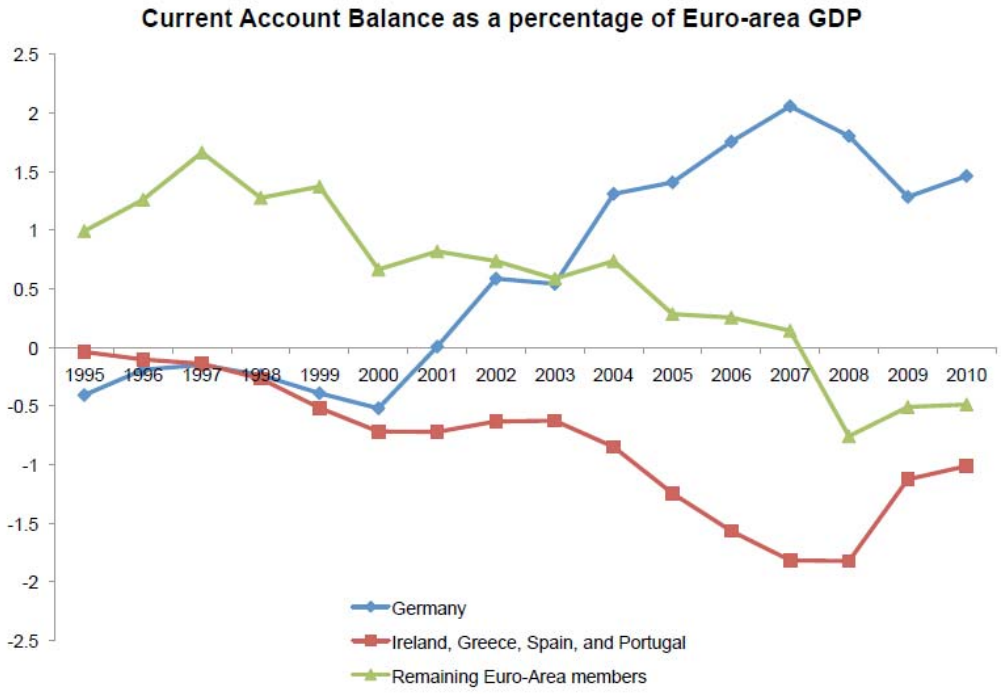


Figure 3: US saving, investment, and current account (normalized by GDP)

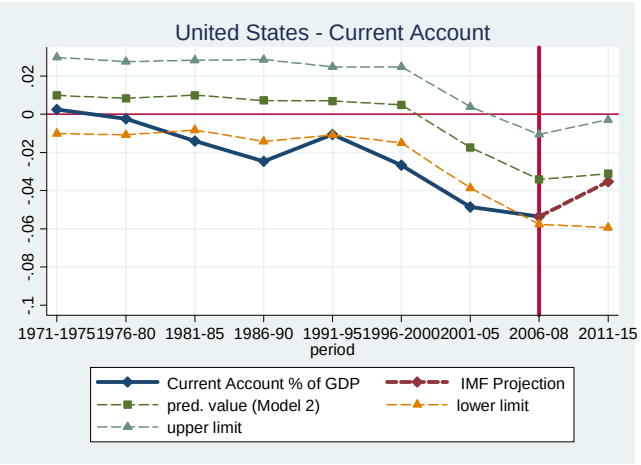
Figure 4



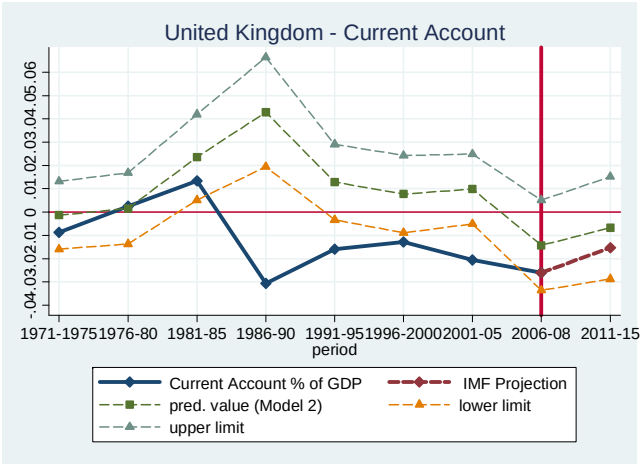
Source: IMF World Economic Outlook Database, April 2010. Estimates for 2010.

Figure 5. Out-of-Sample Predictions for 2006-08 and 2011-15 (using data up to 2008)

(A)



(B)



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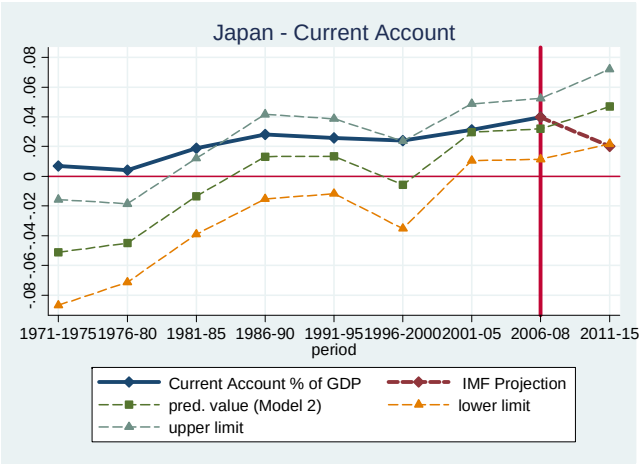
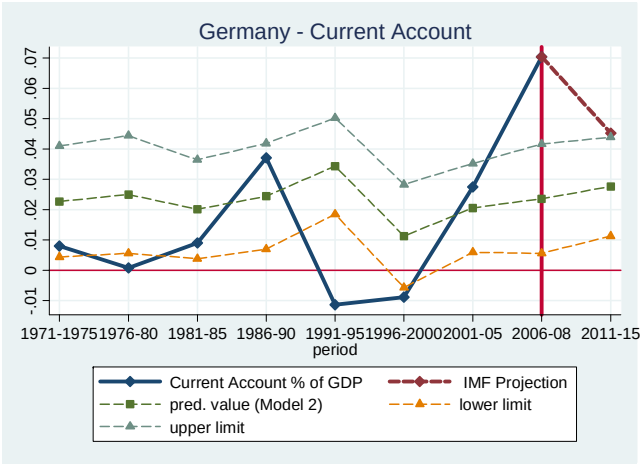


(D)



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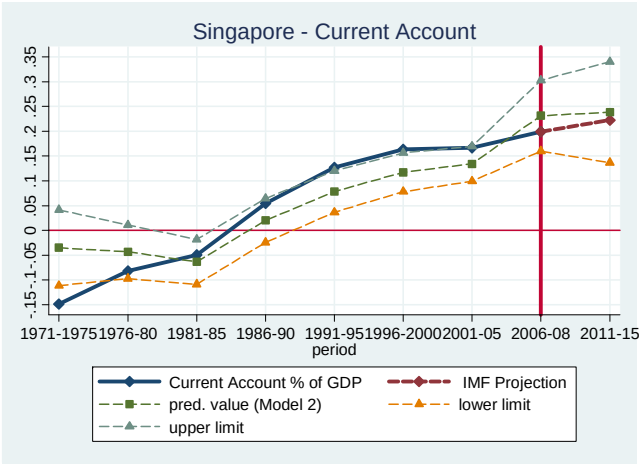

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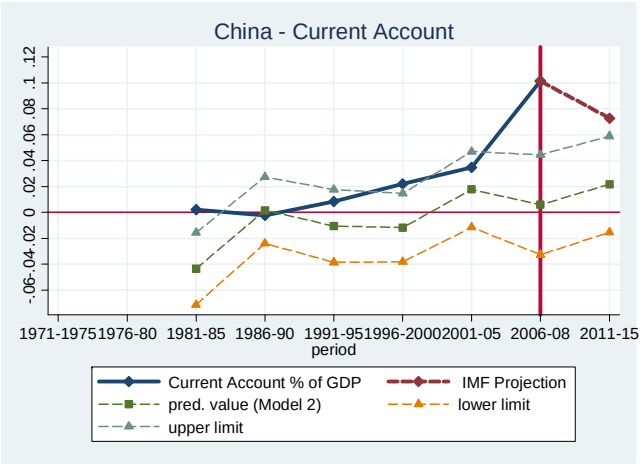
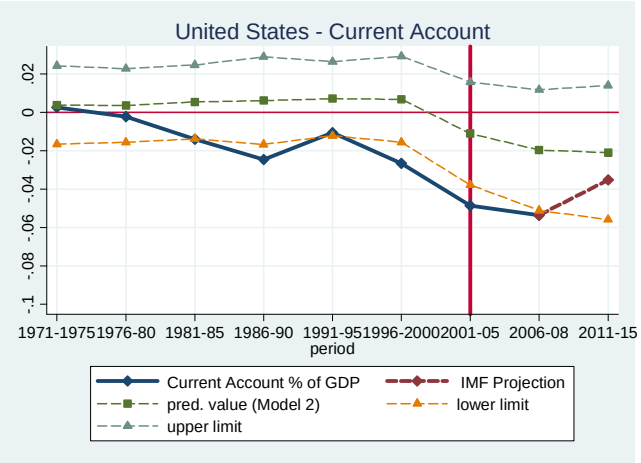
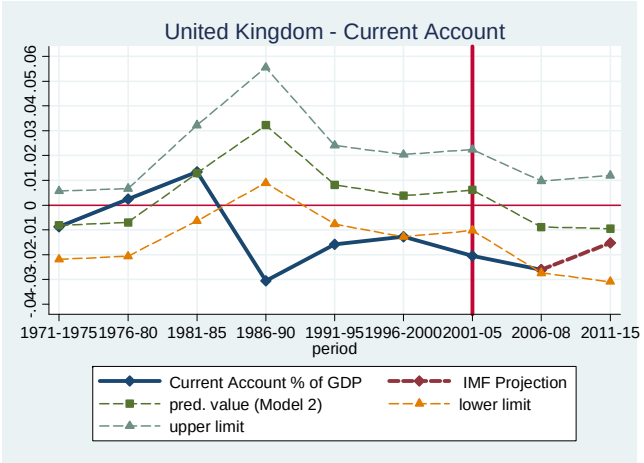


Figure 6. Out-of-Sample Predictions for 2006-08 and 2011-15 (using data up to 2005)

(A)



(B)



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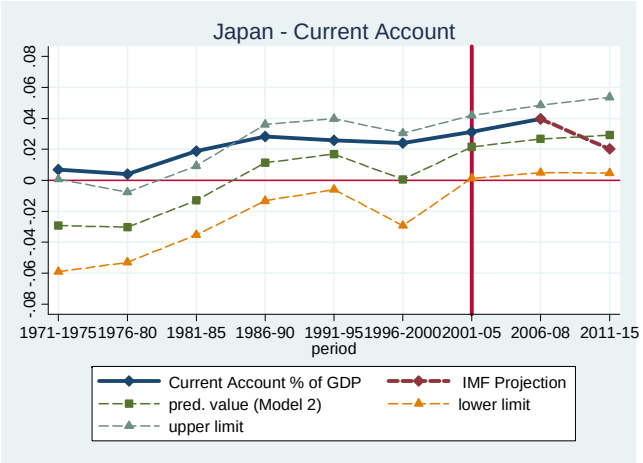

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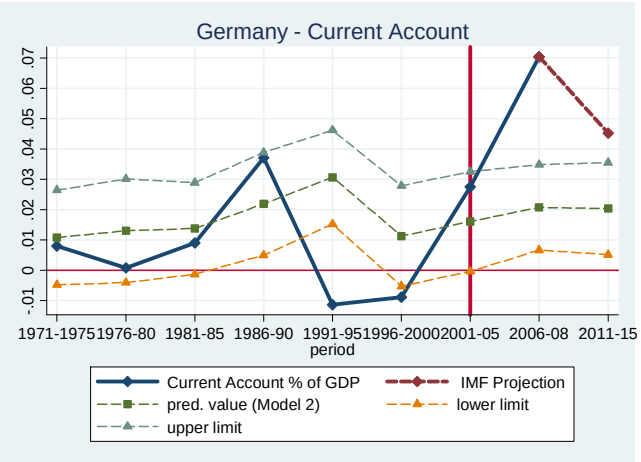

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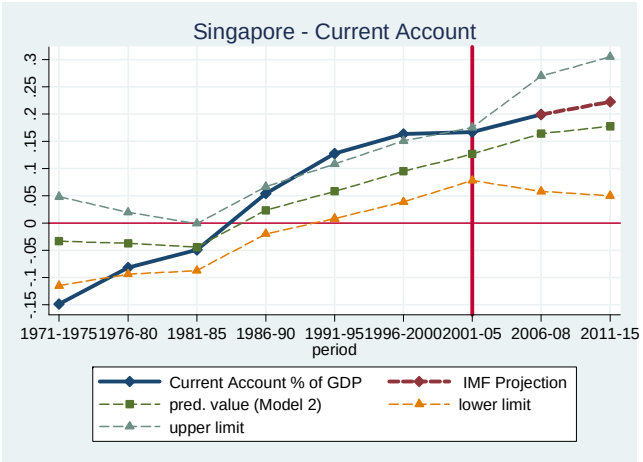

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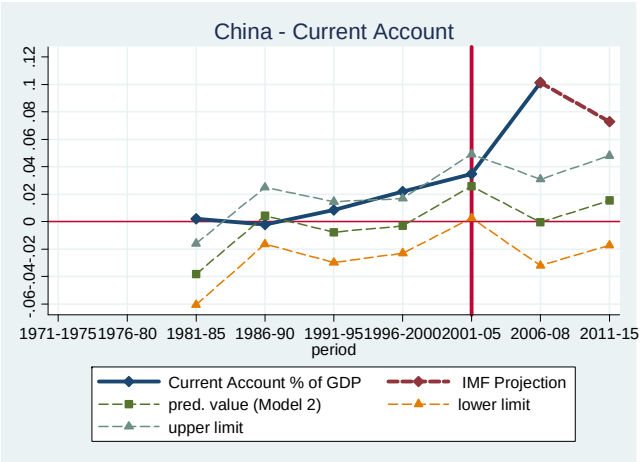

Figure 7. U.S. Current Account Projections for Optimistic and Pessmistic Scenarios

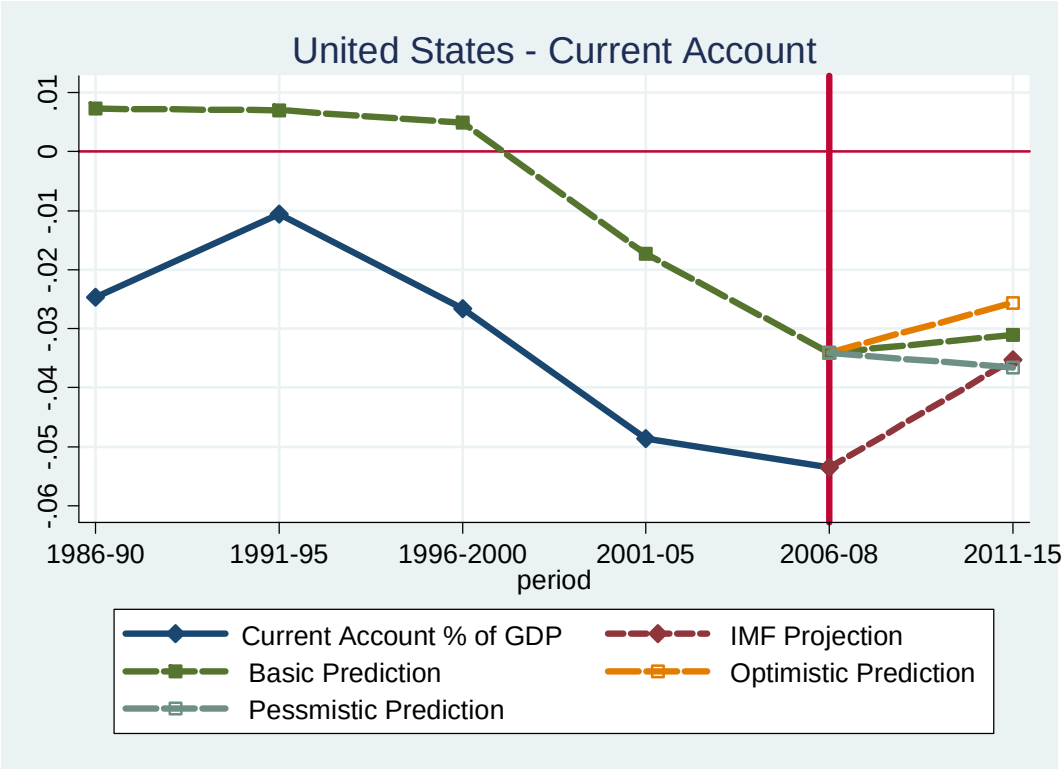

Figure 8. What if China Liberalizes Its Financial Markets

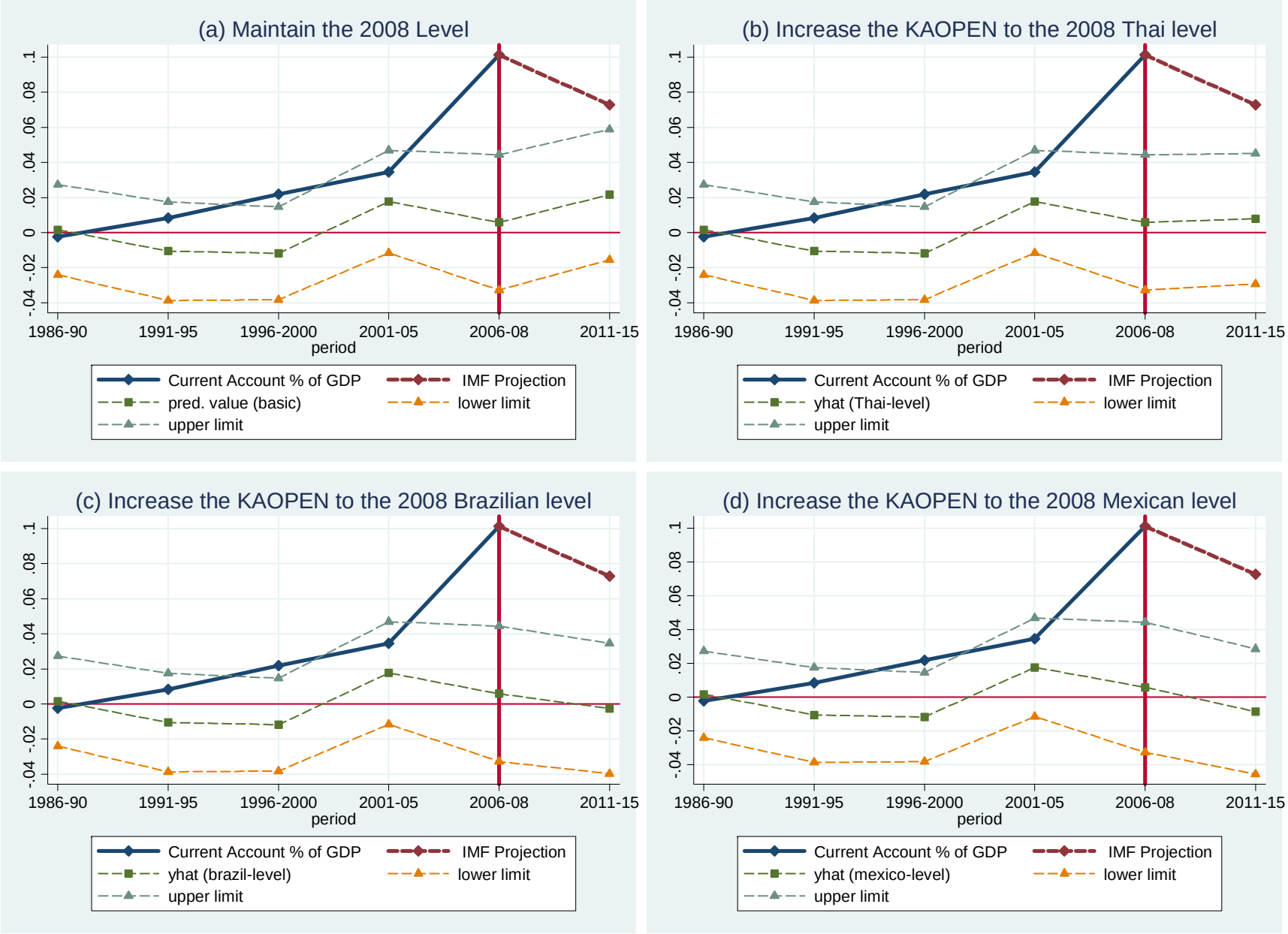

Figure 9. What if China both Develops and Liberalizes Its Financial Markets