

**Global Imbalances:  
Are They Back, Should We Worry, and What Should We Do About Them?**

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In this paper we make three points about global imbalances. First, we show that the imbalances problem, despite having retreated during the crisis, has not gone away. Second, imbalances of the magnitude we are currently witnessing reflect unsustainable levels of leverage and heighten vulnerability to disruptive current account reversals. Third, more forceful steps are needed to raise national saving relative to income in the United States and other deficit economies and to raise spending in surplus countries like China. Real exchange rate changes will be required as part of this adjustment. Our conclusions are informed by a cross country panel analysis of over a 100 countries. The empirical results confirm the importance of budget balances and household leverage while discounting the impact that financial development will have on Chinese surpluses.

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Global imbalances are a hardy perennial.<sup>1</sup> The absolute value of global current account surpluses and deficits as a share of GDP, a conventional summary measure of the extent of the phenomenon, began its sharp upward march in the late 1990s, although imbalances so measured receded temporarily when advanced-country spending declined with the 2000-1 recession. Between 2002 and 2006 the growth of imbalances was explosive, reaching six per cent of global GDP on the eve of the global credit crisis, after which they (and aggregate demand) collapsed again (see A-Figure 1).<sup>2</sup>

In this paper we ask three questions about global imbalances. Are they back? Should we worry? And, if so, what should we do about them?

To address the first question – are they back? – we estimate a forecasting model of the determinants of current account balances using data for 100-plus economies since 1970.<sup>3</sup> We then use our estimated coefficients and forecasts of the independent variables to project the evolution of global imbalances to 2016. Our projections show imbalances widening back out toward their pre-financial-crisis levels. The IMF, for its part, foresees essentially no movement in the magnitude of global imbalances over the period.<sup>4</sup> We are, if anything, even more pessimistic. Be this as it may, there is essentially no question that global imbalances are back.

On the second question – should we worry? – there is disagreement. Some commentators warned that global imbalances were a source of vulnerability for the world economy even before the financial crisis, and they take the crisis as validation of their thesis.<sup>5</sup> Others saw the growing divergence of savings and investment rates as reflecting the role of increased capital mobility in facilitating a more efficient allocation of resources and dismiss imbalances as irrelevant to the crisis or at most as playing a subsidiary role.<sup>6</sup>

These different views of earlier imbalances obviously have different implications for whether we should now worry about their reemergence. The first suggests that the reemergence of imbalances augers the reemergence of crisis risk. The second, while not necessarily dismissing the existence of crisis risk, argues that a fixation on global imbalances diverts attention from its true nature and sources. Blanchard and Milesi-Ferretti (2010) have sought to reconcile the two views by pointing to coexistence of two types of imbalances: “good imbalances” resulting from the intertemporal optimizing decisions of households, firms and governments that, by construction, are unlikely to cause future problems; and “bad imbalances” resulting from domestic distortions that are bound to give rise to such problems if their causes are not corrected. But if this is a useful distinction in theory, it is not an easy one to make in

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<sup>1</sup> Google’s Ngram viewer tabulates mentions of the term back as far as 1960 (coincident, one might observe, with the development of early fears about the U.S. external deficit and the dollar). There is a first notable increase in references after 1985, the period of the strong dollar and burgeoning U.S. deficit that led first to the Plaza and then the Louvre Accord, with a peak in the early 1990s. But the real takeoff in references is in 2003, and the trend has been strongly upward ever since.

<sup>2</sup> Albeit while remaining at higher levels than in 2001.

<sup>3</sup> 1970 marking the advent of increasingly flexible exchange rates and increasingly open capital accounts.

<sup>4</sup> Most of the narrowing they anticipate is concentrated in oil exporting countries, which is hard to reconcile, in our view, with the Fund’s forecast of continued high energy prices in the medium term.

<sup>5</sup> See for example Obstfeld and Rogoff (2010).

<sup>6</sup> See Dooley, Folkerts-Landau and Garber (2009).

practice. This is why observers continue to debate the role of imbalances in the crisis and why they continue to disagree about the risks they pose going forward.

Then there is the view that what matters is not simply the magnitude of imbalances but how they are financed. A current account deficit financed by foreign direct investment is likely to pose fewer risks than a deficit financed by portfolio capital inflows. Two specific kinds of financing, inflows intermediated by the banking system and offshore borrowing denominated in foreign currency, tend to be especially risky. This perspective focusing on the financial dimension of cross-border imbalances also points to the distinction between gross and net capital flows. It suggests that more than the net capital flow – the capital account counterpart to the current account imbalance – matters for economic and financial stability.

Given the complexity of the issues, our answer to the second question of whether we should worry is, itself, necessarily complex. But under a number of circumstances, including those currently being experienced by the world economy, there are grounds for worrying about the possibility of a disorderly correction.

As for the third question – what should we do? – the unambiguous answer is: more. The Group of Twenty has repeatedly sought to strengthen its monitoring of imbalances and sharpen the incentives for government to correct them. But the measures taken to date, in our view, are unlikely to deliver substantive progress. In the conclusion to this paper we therefore suggest what more G20 governments can do to resolve the imbalances problem.

## **1. Are They Back?**

In the appendix we provide updated estimates of the determinants of global current account imbalances and construct projections for coming years. We organize data for 23 advanced and 86 developing countries since 1970 into a panel of nonoverlapping five year averages.<sup>7</sup> The current account as a share of GDP is regressed on a vector of variables drawn from the literature on the determinants of national investment and savings rates: youth and old-age dependency ratios, GDP growth rates, the sum of imports and exports as a share of GDP, the volatility of the terms of trade, a dummy variable for oil exporting countries, the budget surplus or deficit as a share of GDP, financial development as proxied by private credit as a share of GDP, the Chinn-Ito (2006) measure of capital account openness, legal/institutional development (the first principal component of law and order, bureaucratic quality and effectiveness of anti-corruption measures, all drawn from the ICRG data base), net foreign assets as a share of GDP, per capita income relative to the U.S. in levels and squared, and time fixed effects. All variables but net foreign assets as a share of GDP are converted into deviations from their GDP-weighted world means before calculating five-year averages.<sup>8</sup>

The updated estimates are consistent with earlier literature. Countries with higher per capita incomes have stronger current accounts, other things equal; it is still the case overall that capital flows from high-income countries, where it is abundant, to low-income countries, where it is scarce, though the United States in the recent period is an exception. Countries with higher

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<sup>7</sup> The most recent observation covers only three years owing to still limited data for 2010.

<sup>8</sup> For more details on data sources, see our previous paper.

dependency ratios and therefore lower savings rates have weaker current accounts, other things equal. Oil-exporting countries, which find it difficult to raise absorption quickly when export revenues rise, have stronger capital accounts. More net foreign assets, which mean a stronger income account of the balance of payments, translate into a stronger capital account, as expected. Countries with more leveraged financial systems have weaker current account balances. Countries with stronger government budget balances have stronger current accounts, consistent with the twin-deficits hypothesis. The estimates reported in the appendix suggest that this is one of the more important effects.

There is also some evidence that countries with less well developed financial markets have stronger current accounts, consistent with the Caballero-Farhi-Gourinchas (2008) hypothesis that they export merchandise in order to accumulate safe assets that their own financial systems find it difficult to supply. But that finding is somewhat sensitive to sample and specification.<sup>9</sup>

It is also worth flagging some non-results. A popular explanation for strong current accounts in countries like China is rapid GDP growth, which should raise the savings rate (and therefore the savings-investment balance), what with the current generation of workers enjoying much higher incomes than the older generation when they had been in their earning years. While there is evidence consistent with this hypothesis in the data for saving, national investment rates move in the same direction, thus, there is little net impact on the current account.<sup>10</sup> Evidence of terms of trade volatility and trade openness affecting the current account is similarly weak. Financial (capital account) openness affects investment rates positively, as if countries with open capital accounts are able to finance larger shares of investment abroad. At the same time it has an inconsistent and often insignificant impact on the current account overall.

Out-of-sample forecasts require assumptions about the evolution of the independent variables. For government budget balances, we use the IMF's World Economic Outlook (WEO) projections.<sup>11</sup> Relative incomes and GDP growth rates are similarly extrapolated using WEO projections. Forecasts of youth and old age dependency ratios are from the United Nations World Population Prospects data base. Capital account openness and financial development are assumed to remain unchanged, although for China we consider a range of assumptions. For other variables we similarly assume no change.<sup>12</sup>

We use these assumptions and the coefficients obtained when estimating the model separately for advanced countries and emerging markets to construct forecasts for the period 2011-2016, a longer period than in our previous studies. We omit the crisis years 2009-10, since current accounts in this period were perturbed by special factors.

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<sup>9</sup> Which may be why the Caballero-Farhi-Gourinchas interpretation of global imbalances is controversial.

<sup>10</sup> This was noted previously by Eichengreen and Fifer 2002; the pattern will also be apparent to close observers of China.

<sup>11</sup> With imputations for countries not included there.

<sup>12</sup> For further detail we again refer the reader to our earlier paper.

The forecasts suggest modest shrinkage of the U.S. current account deficit through 2016.<sup>13</sup> The same is true of a second chronic deficit country, the United Kingdom. Our forecasts similarly suggest essentially no decline in the current account balances of surplus countries such as China, Germany, Japan and Singapore.<sup>14</sup>

Other investigators have reached broadly consistent conclusions, as noted above. The IMF, for example, forecasts that the average current account surpluses as a share of GDP of chronic surplus countries will decline between now and 2016 from 7.4 to 3.6 per cent. The average for chronic deficit countries will decline, to a similar degree, from 7.5 to 3.4 per cent of GDP. The coefficient of variation of current account balances as a share of GDP will fall from 10 to 5 per cent. Our estimation model forecasts similar changes for both surplus and deficit countries, though it predicts wider variety in individual countries' forecasts and a smaller drop in the coefficient of variation. Since we are using the Fund's own forecasts for the independent variables, the difference in conclusions must flow from differences in coefficient estimates (from different models, in other words).

Evidently, then, other observers who are more significantly optimistic about the prospects for rebalancing must either be more optimistic about the scope for policy changes (fiscal consolidation for example) or be considering longer horizons.<sup>15</sup>

## 2. Should We Worry?

If global imbalances are back, the question then becomes: should we worry? There are several grounds for answering in the affirmative.

First, imbalances feed the procyclical behavior of credit and asset prices in deficit countries. Current account deficits can develop for different reasons, but one such reason is a boom in credit, lending, leverage and asset prices that fuels domestic spending. Such procyclical dynamics were a factor in the widening of the U.S. current account deficit toward the middle of the last decade (Chinn and Frieden 2011, Eichengreen 2011). Normally that increase in spending elevates the demand for funds, putting upward pressure on interest rates which in turn restrains the growth of spending and the rise in asset valuations. But when the deficit country is able to more freely finance its borrowing as a result of capital inflows from chronic surplus countries, the stabilizing behavior of interest rates is less. The credit and spending boom and resulting build-up of vulnerabilities is correspondingly greater. At the same time, the preference of official foreign purchasers for relatively safe securities and consequent downward pressure on

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<sup>13</sup> Note that the U.S. is something of an outlier, in that international comparisons (not only ours) consistently underestimate the magnitude of its current account deficit in recent years. It is tempting to interpret this in terms of the dollar's exorbitant privilege as the world's international and reserve currency (Eichengreen 2011a) – and to speculate about whether loss of that monopoly could be another factor making for global rebalancing.

<sup>14</sup> To the extent that we find an effect of household leverage in the current account deficits of 2006-08, ongoing deleveraging might exert a positive effect on the US and UK current account balances. We do not incorporate this effect in our forecasts.

<sup>15</sup> As in the case of Taylor and Pradhan (2011). These authors also adopt some assumptions about the short-run that other investigators (we should perhaps say “we”) do not necessarily share: that emerging markets have sated their appetite for foreign exchange reserves, that consumption will boom across emerging markets, and that the advanced countries are about to experience a significant surge of investment.

treasury yields encourages other investors, in search of yield, to shift into riskier investments, adding further to the accumulation of risks.

Estimates in the literature on the impact on U.S. interest rates of official foreign purchases of U.S. treasury securities are consistent with this view. Craine and Martin (2009) find that yields on 10-year U.S. treasury bonds were at least 50 basis points lower in 2005 than if there had been no additional foreign purchases since the end of 2004. Bandholz, Clostermann and Seitz (2009) estimate that 10-year bond yields were 70 basis points lower as a result of foreign inflows. Warnock and Warnock (2009) suggest that the increase in U.S. treasuries held by foreigners depressed yields by 90 basis points. Together these studies suggest that global imbalances were a factor in the bond market “conundrum” highlighted in 2005 by then Federal Reserve Chairman Greenspan. This is not to argue, necessarily, that those imbalances were solely responsible for the subsequent financial crisis. A Federal Reserve policy looser than dictated by the Taylor Rule in 2003-4 was another factor in the conundrum. Lax supervision and regulation were central to the strongly procyclical behavior of the financial system. But none of these observations is incompatible with the conclusion that global imbalances played a contributing role.

In addition, foreign finance for a current account deficit can dry up abruptly, forcing agents to abruptly curtail their spending. Fewer foreign purchases of domestic treasury bonds would put upward pressure on benchmark interest rates. Less foreign funding for domestic banks would similarly put upward pressure on bank lending rates. The higher price and greater difficulty of borrowing are the mechanisms through which the sudden interruption of foreign financing leads to a decline in domestic absorption, narrowing the current account.

Given the difficulty of quickly substituting exports for domestic spending, this kind of current account reversal is likely to create recessionary pressures, which in turn can give rise to nonperforming loans and related financial problems. There are costs of shifting resources between the production of tradables and nontradables. Firms seeking to increase their production of exportables may face collateral constraints that make it difficult to borrow in this now more stringent financial environment. Chari, Kehoe and McGratten (2005) emphasize that the recessionary effect of the sudden stop in foreign finance is recessionary only if other frictions prevent the economy from immediately increasing its net exports, but we would argue that such frictions are an important real world phenomenon.

To be sure, not all current account reversals auger recessions and financial crises (Edwards 2005, Adalet and Eichengreen 2005). But some do. The literature suggests that these risks are greatest when the foreign capital financing the deficit is intermediated by the banking system, which is especially vulnerable to destabilization if that flow reverses direction. It suggests that risks are elevated when the finance in question is foreign-currency denominated, in which case the central bank has limited ability to replace it and to support the banking system generally. In addition, the currency depreciation that is part of the mechanism for crowding in exports in the wake of the current account reversal can be counterproductive when the debt accumulated in the preceding period is foreign-currency denominated.

In fact, there is a literature pre-dating the crisis and concern with global imbalances which points to the importance of currency and maturity mismatches in the banking and corporate sectors as a source of crisis risk.<sup>16</sup> This literature suggested that countries with large current account deficits were often most prone to incurring such mismatches. Countries under the most pressure to finance external deficits would be most inclined to accept financing in risky forms (either foreign currency or short term), while the fact that they were forced to finance large amounts of net debt inclined foreigners to extend financing in this ways as a presumed form of self protection.<sup>17</sup> The point was that it was not simply the net but the gross flows – and their denomination and maturity – that mattered. The difference between then and now is that it was presumed at the time that mismatches were an emerging market problem. We know now, from Lehman Brothers’ short-term funding and European banks’ investments in high-yielding subprime-related derivatives, that gross flows can equally matter for financial stability in advanced countries (see e.g. Borio and Disyatat 2011).

### **3. What Should be Done?<sup>18</sup>**

From this diagnosis of the causes and consequences of global imbalances and their financing flows a prescription for what should be done. Most obviously, chronic surplus and deficit countries can take steps to bring income and spending in line with one another. In the U.S., both government and household savings rates were negative before the crisis. Since then, household savings rates have risen to the high single digits, and most researchers suggest that these higher savings rates are likely to persist as households now seek to repair their damaged balance sheets and reduce what they now recognize to be high levels of leverage. At the national level, however, the increase in household saving has been almost exactly offset by a matching increase in government dissaving (this is why there has been little movement in the U.S. current account balance, except at the height of the crisis, when spending collapsed). This implies the need for the United States to put in place a credible medium-term plan for moving the budget toward balance (although observers will disagree on how quickly that process should commence depending on their views of the fragility of the recovery and the need for short-term fiscal stimulus).

Surplus countries, for their part, must raise spending relative to income in order to rebalance. For China this means reducing both household and corporate savings, which contribute equally to the country’s high savings rate. Enterprise saving can be reduced by strengthening corporate governance (increasing the pressure for firms to pay out dividends and reducing scope for empire building) and by taxing excess retained earnings (or otherwise requiring their transfer to the general government budget, as the government has begun to do). Household saving can be reduced by developing mortgage and other financial markets and erecting a more adequate social safety net, thereby reducing the perceived need to save for a rainy day. All this is part of the latest economic program released in conjunction with the People’s Congress held in March, but plans need to be put in action.

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<sup>16</sup> See inter alia Goldstein and Turner (2004).

<sup>17</sup> Although the recent experience of emerging markets like Brazil, which has complained about the tidal wave of foreign capital hitting its markets as a result of the low interest rate policies of the major advanced economies, suggests that countries in current account balance or surplus can also experience large gross flows.

<sup>18</sup> This section draws on Eichengreen (2011b).

Other surplus countries like Germany and Japan display not so much unusually high savings rates (in light, especially, of their demographic prospects) as low levels of domestic (nonfinancial) investment. Investment tax credits and, in the case of Japan, other policies to finally restore economic growth (the more expansionary monetary policy to which the Bank of Japan committed earlier this year) are therefore more appropriate instruments for achieving a better balance between saving and investment.<sup>19</sup>

The adjustments of savings and investment rates described above will have to be accompanied by changes in real exchange rates. With countries like the U.S. absorbing less of what they produce, they will have to export more, and their real exchange rates will have to depreciate in order to price those exports into international markets. With the former surplus countries now spending more on their own products, their relative price will have to rise; their currencies will have to appreciate. There has been some movement in the requisite direction: the real effective exchange rate of the renminbi (CPI based) has risen by some 15 per cent over the last five years, while the real effective rate of the U.S. dollar has similarly declined by 15 per cent over the period (Bank for International Settlements, 2011, p.38). But nominal (and real) appreciation of the renminbi/dollar rate has now all but halted (as of the time of writing), and Chinese officials have suggested that the exchange rate has now reached its equilibrium level. Our analysis, showing that substantial imbalances remain and are expected to widen going forward, suggests to the contrary that significant additional adjustment is required.

This adjustment can occur in three ways: deflation in countries like the U.S. and UK, inflation in countries like China, and nominal exchange rate adjustment. Inflation and deflation having costs, this is a strong argument for currency flexibility. The question is whether policy makers will allow it to continue and for that matter accelerate, given the fire that is trained on the Fed for “debasement of the dollar” and the export interests in China that benefit from a stable nominal (and undervalued real) exchange rate. And to the extent that some countries, like the U.S., seek to facilitate this adjustment through nominal depreciation while others, like China, resist it, still other economies whose current accounts are broadly in balance and whose capital accounts are open, such as those of Latin America, will see their exchange rates appreciate against the dollar, with less than happy consequences.

Germany as usual is a special case. Currency appreciation would normally be a desirable concomitant of its rebalancing, for the same reasons as in China. But Germany is locked in a monetary union with other countries with competitive difficulties that now have to engineer real depreciations. In other words, currency appreciation is the last thing they and a financially-stable euro area needs. One hesitates to put it this way, but from a global and, indeed, European point of view, inflation may be the least worst solution for Germany. The question in this case is whether the European Central Bank will allow it to come about.

More generally there is the question of why governments and central banks hesitate to take the steps needed to facilitate rebalancing. Building on the literature on international economic policy coordination (e.g. Frankel 1988, Eichengreen and Uzan 1993), we would highlight several obstacles to action. First, policy makers do not all share our diagnosis of the

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<sup>19</sup> As noted above, demographic developments in China (and in Germany as well – see below) can also be expected to move savings rates in a rebalancing-friendly direction.



situation. Where we see a combination of “good” and “bad” imbalances, they see only “good” imbalances and therefore little reason to act. Second, policy makers do not agree with one another. Where U.S. policy makers see imbalances as caused mainly by excessive saving in China, Chinese policy makers see them as caused mainly by excessive spending in the United States. They therefore cannot agree on who should adjust and in what proportion. Third, action is attractive only if coordinated internationally, but international coordination is difficult in the face of first-mover and transactions costs. Sharp increases in taxes or reductions in public spending in the United States are recessionary in the absence of strong increases in spending by China and other surplus countries, while strong increases in spending there would threaten overheating absent consolidation in the deficit countries. Unfortunately, moving together is not easy. Finally, even when policy initiatives designed to facilitate rebalancing are in the national interest, they may be opposed by powerful domestic stakeholders. We noted some examples of this problem above.

Given these potential obstacles, the question then becomes what can be done to encourage and coordinate adjustment. At their February 2011 meeting in Paris, G20 finance ministers agreed to a set of indicators on the basis of which the sustainability of national economic policies would be assessed. These were of three types: public debts and deficits, private savings and debts, and current account balances. The composition of this set was a compromise between U.S. concern that global imbalances reflected Chinese policies toward the current account and the Chinese contention that they were a function of excessive private-sector debt and public-sector deficits in the United States. That said, the compromise was not undesirable, since the three categories of indicators pretty much cover the imbalances waterfront.

At their subsequent summit in April in Washington, D.C., G20 finance ministers agreed that the IMF would take four approaches to identifying levels of these indicators that were problematic.<sup>20</sup>

- First, a structural approach based on economic models (presumably including the global economic model maintained by the Fund and used for the forecasting in the *World Economic Outlook*).
- Second, a statistical approach based on country-specific historical experience and trends.
- Third, a statistical approach that compares national positions with those of other countries at comparable stages of economic development.
- Fourth, a statistical approach that gauges the sustainability of national approaches relative to the experience of other G20 countries.

When conducting these exercises, the G20 agreed that data for 1990 through 2004 will be used. Countries identified as having “persistently large imbalances” according to at least two of these approaches will then be subjected to a detailed assessment by both the IMF and the countries themselves, where the Fund will use its own standardized data, while individual

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<sup>20</sup> So far as we can tell, little additional progress was made in refining these indicators and their implementation at the Cannes G20 summit in November 2011, where discussions were dominated by the debt crisis in Europe and the possibility of mobilizing additional emerging-market funding for the International Monetary Fund. Our discussion of the indicators approach to correcting global imbalances focuses therefore on the agreement reached the previous February in Paris and April in Washington, D.C.

countries will be permitted to use their own national data. This assessment is intended to identify the root causes of their imbalances and impediments to their correction. Larger countries whose policies are likely to have more powerful impacts on their neighbors, meaning those that account for at least 5 per cent of the G20's collective GDP, will be held to more demanding standards and subjected to closer scrutiny.

This language is an interesting combination of the overly specific and overly vague that is typical of international agreements. Specifying four approaches to assessing whether or not imbalances are a problem, some of them in considerable detail, is exceptional for a finance ministers' declaration. This is presumably designed to limit the discretion that can be exercised by the IMF when it undertakes the exercise. It is designed to similarly limit the ability of countries that are the subjects of the exercise to dispute Fund's first-round findings. From the point of view of those concerned about imbalances, both constraints are a good thing.

The IMF reported on key conclusions of the MAP in a February 2012 conference.<sup>21</sup> The approach explicitly eschewed a global-model based approach. Rather, the analytical framework is based upon the saving-investment balance approach. Countries are categorized in terms of the balance of private saving and investment, and public saving balance. It is in this context that the country-specific sources of imbalances are identified (Srinivasin, 2012).

The United States and the UK fell into the private and public dis-saving categories, while India, Japan, France and Germany had private surpluses and public deficits. China stood out as a country with surpluses in both balances. The US, UK, India and France were countries identified as possessing current account deficits. The framework thus makes a distinction between external and internal balances.

The specific identification scheme required comparing each indicator to the average over 2013-15 from the October 2010 WEO projection with reference value. Small, moderate or large imbalances were identified using given thresholds. G-20 members showing large imbalances in at least two of three sectors, and accounting for more than 5 percent of G-20 GDP were selected for closer analysis (Stavrev, 2012).

There is an analytical inconsistency between the approach taken at the two stages. It is not really possible to identify, in the first stage, when an imbalance is a problem without having a view of why it arose. Acquiring the latter requires either agreement on both causes and consequences – that is to say, there must be agreement on an analytical model of the determinants of imbalances – or else it requires a willingness to delegate the decision about how to make that determination to an entity like the IMF.

In the February conference, the IMF stressed structural distortions as the source of the imbalances, thus imposing a kind of exogeneity assumption, and ruling out important systemic

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<sup>21</sup> “Analyzing (External) Imbalances,” IMF , Thursday, February 2, 2012, Washington, D.C.  
<http://www.imf.org/external/np/seminars/eng/2012/imbalance/index.htm>

feedback from the global economy back to the domestic economy. This interpretation would thus rule out, for instance, the idea that the US deficit was driven by excess foreign savings.

It is somewhat surprising that the IMF was able to move forward on a process that identified imbalances and distortions. A cynical take would be that governments were willing to agree on procedures that left the IMF little wiggle room at the first stage because there is no chance that the Fund and the G20 will force them to do anything at the conclusion of the second stage. The IMF has long offered polite suggestions for policy adjustments by its members. But understandably reluctant to bite the hands that feed it, it rarely uses strong language where its large shareholders are concerned. Even if it was more forceful, there still would be nothing to compel compliance, in particular by large countries that issue debt in their own currencies and therefore have no need to borrow from the Fund.

To see this one need only recall the last time that the IMF engaged in a similar exercise. A Multilateral Consultation Initiative was established in 2006 to bring together a handful of countries, under IMF aegis, for consultations on issues where their policies matter jointly rather than separately. The 2006 consultation focused on global imbalances and involved the United States., the Euro Area, Japan, China and Saudi Arabia. While the exercise was an interesting one from all reports, at its conclusion the countries concerned all simply returned to business as usual. Why should the current exercise be any different?

The answer is that in the short run it shouldn't be. A list of countries for which the G20's warning lights are flashing red will presumably be issued. After that the IMF and the members will issue findings on the causes of the imbalances cited on that list, together with their recommendations for corrective action. At which point countries will simply resume business as usual. Does anyone really think that the debate between the Republicans and Democrats in the Congress over the U.S. budget deficit will be fundamentally altered, or even affected on the margin, by advice proffered by the IMF and America's G20 partners? Or that the debate in China between export interests pushing for the maintenance of the current exchange rate and the advocates of greater flexibility would be fundamentally reshaped?

For those of more optimistic bent and for officials who don't wish to believe that they are wasting their time, the argument must be that attitudes and outlooks will evolve as a result of this process. Under the Multilateral Consolidation Initiative, consultations were ad hoc, countries could agree to disagree, and that was it. The G20 process, in contrast, is ongoing. Over time, as analyses are repeated and shared, officials will gravitate toward a common diagnosis of the problem and its solution. American officials will come to understand that their monetary and fiscal policies are a problem for the rest of the world. Chinese officials will come to appreciate the problems their country's chronic current account surpluses pose for other countries. They will come to share a diagnosis of what needs to be done. Importantly, they will be able to sell it to their political colleagues and constituents at home.

There are two things to say about this. First, it is a rather rosy scenario of how outlooks and attitudes evolve. It presumes that dialogue, mediated by a fair broker like the IMF, leads to a meeting of the minds and not a rupture. It presumes that exercises in marriage counseling are an

opportunity for introspection and bring out the rational instincts of the participants, rather than simply providing another venue for bickering and recrimination.

Second, it is a caution against unrealistic expectations. Little can be expected from the G20 process in the short run in terms of substantive policy changes. But it is the process that matters. It is the process that will deliver more extensive international cooperation in the longer run.

The key question is how long is long. It would be unrealistic to suppose that there could occur a strong convergence of national perspectives – not just at the level of leaders but also other national politicians and their constituents – on matters as contentious as debts and deficits, external as well as domestic – in less than, say, five years. This is a reminder that the G20 process is unlikely to protect us from the risks posed by the current constellation of global imbalances and their disorderly unwinding. This means that members need to take other steps to prepare themselves for this eventuality.

#### **4. Conclusion**

In the run-up to the crisis, a growing chorus of voices warned of risks to financial stability posed by global imbalances and the possibility of their disorderly correction. As it happened, we had the crisis but not the disorderly correction. There was no abrupt decline in the willingness of foreigners to finance the U.S. current account deficit. There was no dollar crash of the sort that would be associated with such an event. There was no liquidation of dollar reserves by foreign central banks and governments. To the contrary, the dollar appreciated at the height of the crisis and remained relatively stable thereafter. There was some temporary narrowing of imbalances as demand in the United States was compressed and Chinese exports fell off, but that narrowing was reversed relatively quickly. Current data suggest that global imbalances are still with us. Our projections suggest that, on current policies, this will be true for years.

So, given the absence of that disorderly correction, should the warnings of those pointing to risks from global imbalances now be dismissed?

There are several reasons to think not. First, deficit countries like the United States are now burdened by heavier debt loads and more troubling political questions; at some point, it will no longer be possible to take for granted the safe-haven status that allowed the U.S. to attract capital and finance their deficits even at the height of the crisis. A dollar crash disrupting the operation of U.S. and global financial markets may not have happened last time, but this is no guarantee against it happening in the future.

Second, even if there was no disorderly correction of global imbalances, those imbalances played a role in the development of financial problems that set of the stage for the crisis. In particular, foreign official purchases of so-called safe assets, notably U.S. treasury bonds, encouraged other investors to stretch for yield by moving into riskier assets. Given the absence of more far-reaching regulatory reform, at some point the same could happen again.

Third, surplus countries reluctant to allow their currencies to appreciate as part of the rebalancing process are exposed to inflationary pressures and asset-market bubbles. The risks here are obvious and worrisome.

What should be done? The G20 and IMF should continue to monitor the development of imbalances and seek to identify their sources. They should single out the countries whose policies are most responsible for the phenomenon. They should recommend corrective action, emphasizing the advantages of coordinated over unilateral adjustment. They should continue to develop their procedures in the direction of greater automaticity – in ways that conduce to ruthless truth-telling and leave governments less room to dispute and disregard their findings.

But it is important to acknowledge that it will take time to build an analytical consensus on the nature of the problem and the steps needed to correct it and to develop G20/IMF procedures in the direction of greater automaticity. The international policy community has tried multilateral consultations before. It has repeatedly sought to encourage international economic policy coordination. It has found that consensus building is hard work and that international cooperation is easier said than done. This is not an argument against trying, but it is a caution against expecting early results.

Meanwhile governments and central banks should take steps to bullet-proof their economies. For deficit and surplus countries alike, this means using macro- and micro-prudential regulation to limit the scope for financial and macroeconomic instability in the event that the dollar depreciates sharply. For economies that continue to rely on exports as an engine of growth, it means proactive steps to diversify sources of demand, but also keeping their fiscal powder dry (i.e. by running budget surpluses) so that fiscal policy can be deployed to sustain demand if global imbalances unwind suddenly. It means ensuring adequate access to foreign currency funding, not simply by accumulating reserves but by contributing to the further development of global and multilateral liquidity-pooling arrangements.

Like those who interpret global imbalances through the prism of “Bretton Woods II,” one can always possibly hope for the best. But it is the responsibility of policy makers to prepare for the worst.

## References

- Adalet, Muge and Barry Eichengreen (2005), "Current Account Reversals: Always a Problem?" NBER Working Paper no.11634 (September).
- Aizenman, Joshua and Y. Jinjark (2009), "Current Account Patterns and National Real Estate Markets," *Journal of Urban Economics* 66, pp.75-89.
- Bandholz, Harm, Jorg Clostermann and Franz Seitz (2009), "Explaining the U.S. Bond Yield Conundrum," *Applied Financial Economics* 19, pp.539-550.
- Bank for International Settlements (2011), *81<sup>st</sup> Annual Report*, Basel: BIS.
- Blanchard, Olivier and Gian-Maria Milesi-Ferretti (2009), "Global Imbalances: In Midstream?" [www.imf.org](http://www.imf.org) (December).
- Borio, Claudio and Phil Disyatat (2011), "Global Imbalances and the Financial Crisis: Link or No Link?" BIS Working paper no.346 (May).
- Caballero, Ricardo, Emmanuel Farhi and Pierre-Olivier Gourinchas (2008), "An Equilibrium Model of 'Global Imbalances' and Low Interest Rates," *American Economic Review* 98, pp.358-393.
- Chari, V.V., Patrick Kehoe and Ellen McGratten (2005), "Sudden Stops and Output Drops," *American Economic Association Papers and Proceedings* 95, pp.381-387.
- Chinn, Menzie and Jeffrey Frieden (2011), *Lost Decades: The Making of America's Debt Crisis and the Long Recovery*, New York: W.W. Norton.
- Chinn, Menzie and Hiro Ito (2006), "A New Measure of Financial Openness," *Journal of Comparative Policy Analysis* 10, pp.309-322.
- Chinn, Menzie, Barry Eichengreen and Hiro Ito (2011), "A Forensic Analysis of Global Imbalances," mimeo (October).
- Claessens, Stijn, Giovanni Dell'Ariccia, Deniz Igan, and Luc Laeven (2010), "Cross-Country Experiences and Policy Implications from the Global Financial Crisis," *Economic Policy* 25(62).
- Craine, Roger and Vance Martin (2009), "Interest Rate Conundrum," *B.E. Journal of Macroeconomics* 9, p.1-27.
- Dooley, Michael, David Folkerts-Landau and Peter Garber (2009), "Bretton Woods II Still Defines the International Monetary System," *Pacific Economic Review* 14, pp.297-313.
- Edwards, Sebastian (2005), "Capital Controls, Sudden Stops, and Current Account Reversals," NBER Working Paper no. 11170 (March).

Eichengreen, Barry (2011a), *Exorbitant Privilege: The Rise and Fall of the Dollar and the Future of the International Monetary System*, New York: Oxford University Press.

Eichengreen, Barry (2011b), “The G20 and Global Imbalances,” *Economic Policy Program Brief*, Washington, D.C.: German Marshall Fund of the United States (May).

Eichengreen, Barry and Molly Fifer (2003), “The Implications of Ageing for the Balance of Payments,” in Horst Siebert (ed.), *Economic Policy for Ageing Societies*, Berlin: Mohr.

Eichengreen, Barry and Marc Uzan (1993), “The 1933 World Economic Conference as an Instance of Failed International Cooperation,” in Peter Evans, Harold Jacobson and Robert Putnam (eds), *Double-Edged Diplomacy: International Bargaining and Domestic Politics*, Berkeley: University of California Press.

Frankel, Jeffrey (1988), “Obstacles to International Economic Policy Coordination,” *Journal of Public Policy* 8, pp.353-374.

Gagnon, Joseph (2011), “Current Account Imbalances Coming Back,” *Peterson Institute for International Economics working paper* No. 11-01.

Goldstein, Morris and Philip Turner (2004), *Controlling Currency Mismatches in Emerging Markets*, Washington, D.C.: Institute for International Economics.

International Monetary Fund (2011), *World Economic Outlook*, Washington, D.C.: IMF (April).

Obstfeld, Maurice and Kenneth Rogoff (2010), “Global Imbalances and the Financial Crisis: Products of Common Causes,” in Reuven Glick and Mark Spiegel (eds), *Asia and the Global Financial Crisis*, San Francisco: Federal Reserve Bank of San Francisco, pp.131-172.

Srinivasin, Krishna, (2012) “Mutual Assessment Process: Overview,” presentation at IMF conference “Assessing (External) Imbalances,” Washington, DC, February 2, 2012.

Stavrev, Emil (2012), “G-20 MAP Indicative Guidelines,” presentation at IMF conference “Assessing (External) Imbalances,” Washington, DC, February 2, 2012.

Taylor, Alan and Manoj Pradhan (2011), “The Great Rebalancing,” *Morgan Stanley Global Economic Forum* (18 February), <http://www.morganstanley.com>.

## Appendix

The paper draws upon results reported in this appendix, and, with greater detail, in Chinn, Eichengreen and Ito (2011). These results in turn are based upon estimates of an analytical model of current account balances as well as national saving and investment. Representative work includes Chinn and Prasad (2003) and Chinn and Ito (2007). We consider two basic specifications:

Model 1:

$$y_{i,t} = \alpha + \beta_1 BB_{i,t} + \beta_2 FD_{i,t} + X_{i,t} \Gamma + u_{i,t} \quad (1)$$

Model 2:

$$\begin{aligned} y_{i,t} = & \alpha + \beta_1 BB_{i,t} \\ & + \beta_2 FD_{i,t} + \beta_3 LEGAL_{i,t} + \beta_3 KAOPEN_{i,t} \\ & + \beta_4 (FD_{i,t} \times LEGAL_{i,t}) + \beta_5 (LEGAL_{i,t} \times KAOPEN_{i,t}) + \beta_6 (KAOPEN_{i,t} \times FD_{i,t}) \\ & + X_{i,t} \Gamma + u_{i,t}. \end{aligned} \quad (2)$$

$y_{i,t}$  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*).<sup>22</sup>  $X_{i,t}$  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 the 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.<sup>23</sup> 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 Chinn, et al., 2011).

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<sup>22</sup> *LAO*, *BQ*, and *CORRUPT* are extracted from the ICRG database. Higher values of these variables indicate better conditions.

<sup>23</sup> The variables for ToT volatility (*TOT*), trade openness (*OPN*), and legal development (*LEGAL*) are averaged for each country, i.e., they are time-invariant.



The original annual data include 23 industrial and 86 developing countries covering the four decades 1970-2008.<sup>24</sup> We regress current account balances, national saving, and investment on the same set of regressors separately for industrialized countries (IDC), developing countries (LDC) and emerging market economies (EMG).<sup>25</sup>

## Baseline Results

A-Table 1 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. 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 individually 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.<sup>26</sup> 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 current accounts (“capital flows from 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).<sup>27</sup> 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.

We include dummy variables for the 2001-5 and 2006-8 subperiods in order to examine the question of whether recent experience has been unusual.<sup>28</sup> 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.<sup>29</sup> A surprise is that we see the industrial countries as a group running larger surpluses in the same

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<sup>24</sup> The five year panels are 1971-75, 1976-1980, etc. However, the last panel is composed of only three years: 2006-08. We can consider the last panel as the years of the global imbalances.

<sup>25</sup> 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.

<sup>26</sup> Although this result does not show up for the industrial countries.

<sup>27</sup> The  $p$ -value is 15%.

<sup>28</sup> Time fixed effects for all the five-year periods (except for the first five-year period) are included in the estimation, but only those for the 2001-05 and 2006-08 periods are reported in the table.

<sup>29</sup> 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.

2001-5 period than their other characteristics would lead one to expect. Evidently the United States was an outlier in this respect.<sup>30</sup>

A-Table 2-1 add the institutional variables. 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 and the IDC and EMG subsamples, the results are again supportive of the Caballero et al. interpretation of global imbalances with statistically significant coefficients. 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). Also, consistently with the saving glut hypothesis, further financial deepening coupled with higher levels of legal development would worsen current account balances. When we look only at the industrial countries, however, these patterns are no longer evident.

One can investigate how each of these variables affect saving and investment individually. Complete findings are reported in Chinn et al. (2011), but a few results are of note. First, government budget deficits affect primarily national saving (in the same direction as government saving, contrary to Ricardian equivalence stories). Second, dependency ratios affect both savings and investment (as emphasized in Eichengreen and Fifer 2002).<sup>31</sup> Third, as the saving glut proponents argue, increased financial development lessens the need for precautionary saving. Hence, if a country is equipped with better-developed legal systems, the negative impact of financial development on national saving can be enhanced. 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 A-Table 1 or A-Table 2-1, 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.

### **Contributions of the Determinants to Imbalances**

To examine what may have contributed to the global imbalances, we need to have a more in-depth analysis on how the determinants of current accounts contributed to the rise and fall of the balances. As we discussed in Section 2, there are competing, but not mutually exclusive, hypotheses that identify important factors to current account balances. The estimation from the previous section allows us to observe how the contributions of the explanatory variables have evolved over time.

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<sup>30</sup> 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.

<sup>31</sup> The Ricardian hypothesis predicts that any change in public saving would be offset by the exact same change but with the opposite sign in private saving, thus making the estimated coefficient of budget balances zero. The Ricardian framework can be extended to predict public dissaving would not crowd out private investment, thus making public saving and investment uncorrelated.

A-Figure 3 illustrates, for several selected countries, the actual contributions of the factors of our interest (i.e.,  $\hat{\beta}_i x_i$ ) to current account balances using the estimates from the regression analysis we reported in A-Table 2.<sup>32</sup> While we have a large number of explanatory variables, we want to focus on several variables to compare the competing hypotheses. Therefore, we group some of the contributions of the variables of our interest. More specifically, we group the estimated contributions of financial development, legal development, financial openness, and their three interactions into one group, and call it the contribution of the “saving glut” group of variables. We also group the contributions of young and old dependencies into the “demography” group. Besides these two groups, we show the estimated contributions of budget balances and net foreign assets. The other factors are lumped into the “Others” group. The figures in the left column illustrate the contributions of factors to the levels of current account balances. Those in the right column on the other hand illustrate the contributions to the changes in the current account balances of the changes in the factors, or the groups thereof, of our interest. By construction, the sum of all the four bars should add up to the predicted values, or changes in the predicted values (the dotted line with the square nodes). Comparing these bars with the actual current account balances, or changes in current account balances (the solid line with the diamond nodes), should allow us to make some inferences about what factors have contributed to the current account balances or their changes, and thereby differentiate between the competing discussed in the previous section.

First, while the contributions of budget balances and net foreign assets have varied over time, those of the “saving glut variables” and “demography” have tended to be stable. Second, the contribution of the demographical factors is large for industrialized countries, but not so for emerging market economies. Third, for the United States and the United Kingdom, changes in the budget balance are more correlated with the changes in the current account balances. Fourth, the group of the “saving glut variables” has been contributing to improving current accounts for emerging market countries, but its effect has been of a long-standing nature.

These observations are confirmed in A-Table 3 which reports the “beta” coefficients corresponding to the specifications reported in A-Table 2-1; beta coefficients are reported to highlight the relative importance among the explanatory variables in a single regression. The coefficient estimates in this table should be interpreted as showing by how many standard deviations the dependent variable should move if one of the explanatory variable moves by one standard deviation, *ceteris paribus*. According to A-Table 3, budget balances, net foreign asset, and old dependency ratios affect the variation of current account balances for the sample countries. The saving glut variables are found to have more influence on the variation of current account balances for the industrial countries, but not necessarily in line with the prediction of the saving glut hypothesis. While the levels of legal development or financial openness is an important determinant for the less developing countries, the interactions between financial and legal development or between financial development and openness are important for emerging market countries in a way consistent with the saving glut hypothesis. However, the magnitude of contribution is not great.

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<sup>32</sup> The contributions are calculated using the estimation results for the subgroup of countries the relevant country belongs to.

## Financial Booms and Leverage as Contributors to Current Account Balances

Despite the extensive set of explanatory variables included in the specifications we examined, additional candidates have been surfaced in the wake of the financial boom and bust of the last decade. In the period prior to the financial crisis of 2008-09, households in many advanced economies, most notably the United States, increased their debt loads, fueling domestic absorption. While observers have identified as important a number of factors as key to the boom in household borrowing and consumption -- low interest rates, lax standards for bank lending, a global-scale expansion of exotic mortgage products and securitized loans --, many of them are difficult to measure for meaningful empirical analysis.

We proceed in our analysis by augmenting our specifications with a household ‘leverage’ variable. Here, we define leverage as the ratio of debt to household disposable income. Using the OECD database, we have *HH-Leverage 1*, which is the growth rate of the ratio of household debt (‘general loans’) to disposable income as the general measure for the growth in household leverage. We also have *HH-Leverage 2*, that is the growth rate of the ratio of household mortgage debt to disposable income. As a comparison, we also construct *G-Leverage*, that is the growth rate of the ratio of government debt to government revenue as the measure of government leverage. While *G-Leverage* is available for most of OECD countries since the early 1970s, *HH-Leverage 1* and *HH-Leverage 2* are quite limited, available for a smaller number of OECD countries only after 1995.<sup>33</sup>

A-Figure 4 illustrates the development of the growth rates of these leverage measures.<sup>34</sup> In panels (a) through (c), we can see that countries did experience high growth in leveraging in the years leading up to the crisis of 2008-09. The growth rates are especially higher when we measure the level of leveraging using the mortgage loan debt as we discuss anecdotally. We cannot discern any regularity in government’s leveraging. However, it seems that the level of leveraging declined in several years leading to the crisis period.

We now include these variables in our estimation and report the results in A-Table 4. We must note that the data availability of the leverage measures restrict our sample. The estimations are now run only for the OECD countries, and those with either *HH-Leverage 1* or *HH-Leverage 2* cover data from 1996 on, i.e., the last three five-year panels, 1996-2000, 2001-05, and 2006-08. The estimations with *G-Leverage* include more panels (starting in 1971), but the sample is limited in earlier panels.

A-Table 4 shows that higher growth in the level of general household leverage leads to worsening of the current account as we expect. A one percentage point increase in the growth rate of household leveraging leads to a 0.25 percentage point *decrease* in the current account balance. However, when we measure household leverage focusing on home mortgage, we do not see any significant negative impact on the current account. In column (3), we also see that the

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<sup>33</sup> *G-Leverage*, *HH-Leverage 1*, and *HH-Leverage 2* are available for the maximal of 30, 27, and 16 countries, respectively, though the availabilities are mostly concentrated in recent years.

<sup>34</sup> In the OECD database, the level of household disposable income is not available, but the annual growth rate is available. Hence, we calculate the growth rate of household leverage measures as the growth rate of household debt, either general or home mortgage, minus the growth rate of household disposable income.

government's taking more leverage can lead to worsening current account balances, again consistent with theoretical prediction.<sup>35</sup> When we include both *HH-Leverage 1* and *G-Leverage*, however, the impact of *G-Leverage* now becomes positive. Given that the coefficient of *HH-Leverage 1* remains negative with even greater magnitude and statistical significance, and also that the simple correlation between *HH-Leverage 1* and *G-Leverage* is found to be quite low, the positive coefficient of *G-Leverage* should not be driven by multicollinearity. We interpret the result as being driven by greater government debt accumulation in the slowdown.<sup>36</sup>

Given the extent of global imbalances and financial boom experienced in the 2006-08 period, we also seek to identify any evidence for a heightened effect of leveraging. To that end, we include interaction terms between the fixed effect for the 2006-08 period and the leverage variables and report the right half of A-Table 4. In the model that includes both *HH-Leverage 1* and *G-Leverage* and their interactions with the 2006-08 period dummy, we see evidence that the growth in household leveraging has a particularly higher impact on the current account in 2006-08. There seems to be an additional impact of household leveraging in terms of mortgages in the 2006-08 period, but it is not statistically significant. We also see the impact of government leveraging is particularly high in the 2006-08 period as well.

### **Foreign Reserve Accumulation**

Another variable one may be interested in as a contributor to current account balances is international reserves holding. Most of large international reserve holders run current account surpluses constantly as we see among East Asian countries and oil exporting countries. As we have seen previously, the Bretton Woods II argument by Dooley et al. focuses on the link between international reserves holding and continuous current account surpluses. However, it is difficult to examine the impact of international reserve holding on current account balances because the current account balance and contemporaneous reserves are simultaneously determined – positive shocks to the current account will translate into positive shocks to reserves.

Hence, we include in our estimation foreign reserves as a percent of GDP, lagged one five-year period, as an additional explanatory variable<sup>37</sup> Our presumption is that, other things equal, larger reserves from the previous period – that can also represent the past tendency of international reserves holding – should mean less incentive for reserve accumulation and a weaker current account.<sup>38</sup> 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.<sup>39</sup> Because of the simultaneity issue, we do not further pursue the effect of international reserves holding.

### **An East Asian or U.S. Phenomenon?**

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<sup>35</sup> Our results differ from Claessen, et al. (2010), who find a strong role for mortgage debt.

<sup>36</sup> When we use the government leverage variable calculated using the data on government debt and revenue from IMF's WEO, the results are unchanged although the number of observations increases significantly.

<sup>37</sup> Results not reported in the table.

<sup>38</sup> Gagnon (2011) argues that the change in the foreign exchange reserves should be included.

<sup>39</sup> These estimates are based on model 2 including the institutional variables.

As was in the case of international reserves, some of the competing hypotheses for the global imbalances unsurprisingly focuses on socio-economic, institutional, or geographical characteristics of the countries that have run persistent current account imbalances such as East Asian countries and the United States. Capital flows can be affected by some externality in geographical regions as well as political or geopolitical roles of the countries, but these factors may be not fully represented by the explanatory variables.

In fact, if we include the dummies for the United State, China, or other East Asian emerging market countries in our basic estimation model using the full sample, these dummies turn out to be significant.<sup>40</sup> The dummy for the United States is found to be -3.5% whereas the ones for China and ex-China East Asian emerging countries are +3.3% and +2.4%, respectively (not reported). These results suggest that there can be unobservable factors contributing to the determination of current account balances.

We then ask whether the country- or country-group- specific factors are stable over time by allowing the dummies for the U.S. and East Asian emerging markets to vary over 5-year panels. The resulting “U.S. effect” is relatively stable, though ranging between -2.0 to over -6.0%. 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 on average. The obvious candidate is its status as the issuer of the international vehicle currency.

The “ex-China East Asian” or “China” effect is, on the other hand, not stable over time the effect for the East Asian emerging market countries is evident only after the Asian crisis of 1997-98, reflecting the investment drought in the post-crisis period (Chinn and Ito, 2007). Considering that “excess” current surplus is more of a recent phenomena despite the long-time focus on export-led industrial policy, it is difficult to argue that the main cause for these countries’ persistent current account surplus is due to their mercantilism motives.

The same argument applies to China. While there are some time periods when China’s current account balances are higher than model predictions, it is noteworthy that its current account surplus is especially high in the global imbalances period, marking the level of excess surplus as high as 7% of GDP.

### **Are the Current Account Balances Atypical in the 2006-08 Period?**

The observations from the last section suggests the possibility that current accounts may have behaved atypically in the 2006-08 period, which is the global imbalances period prior to the global crisis. A-Figure 5 displays the implied current account balances for several countries along with 95% confidence intervals of prediction that are calculated using the estimation results shown in A-Table 2.<sup>41</sup> The figure shows that the U.S. current account deviated from the predicted path significantly in the 1996-2000 and 2001-05 periods though it falls back in the 95% confidence interval in the last period. Germany’s and China’s current accounts are well outside the confidence interval. These results suggest the possibility of missing variables that are not captured by the estimation model as far as the last period is concerned.

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<sup>40</sup> “East Asian emerging market countries” include China, Indonesia, Korea, Malaysia, and Thailand.

<sup>41</sup> We continue to use Model 2 (Table 2-1) that includes institutional variables and their interactions.

Tor the full sample and the LDC and EMG subsamples, the distribution of the prediction errors from the baseline estimation has become significantly wider in the 2006-08 period.<sup>42</sup> For the group of industrialized countries, the prediction errors are more skewed to the left and more widely distributed widely distributed in 2006-08, but wide variation of the prediction errors appears also in the 1980s and the 1990s besides the last period.

In sum, our estimation model does not seem to predict well the current account series in the 2006-08 period for developing countries, especially those with emerging markets, and to a lesser extent the same conclusion can be made for the group of industrial countries, suggesting a possibility of a regime shift in the current account balance series in this period.

### **2006-2008: A Structural Break**

Given the substantial anecdotal evidence in favor of a structural break in the current account behavior in the period immediately before the global crisis, applied a formal statistical test. Here, we make out-of-sample predictions retroactively and recursively and estimate the probabilities of actual current account balances compared to the distributions of predicted levels of current account so as to examine whether the realized current account balances were “surprises” or not. More specifically, we first make the forecasts of current account balances for the 2006-08 period using data through 2005. We then calculate the confidence intervals of the (retroactive) forecasts, which we call the “pseudo-confidence intervals of forecast”.<sup>43</sup> With the pseudo-confidence intervals of forecast, we can estimate the probability of an actual, or realized, value of current accounts by calculating how many standard deviations the realized value of current accounts is away from the “forecasted” value. The number of standard deviations corresponds to the *t*-statistics (adjusted for the degrees of freedom), and gives us the *p*-value of the realized current account balancing occurring. We found evidence in favor of breaks for a large number of industrial and emerging market economies during the 2006-08 period. The full details are reported in Chinn et al. (2011).

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<sup>42</sup> The unstable distribution of prediction errors is consistent with our use of heteroskedastic-consistent standard errors.

<sup>43</sup> We need to be careful about the distinction between the “confidence intervals of predictions” and the “confidence intervals of forecasts.” The former is literally the confidence intervals of predicted values, or the conditional mean of  $y$  (i.e.,  $\hat{y}$ ) given a set of regressors  $x_i$ 's. The confidence interval of predictions reflects the uncertainty of the estimated coefficients (captured by the confidence intervals of  $\hat{b}$  in  $X'\hat{b}$ ). The “confidence intervals of forecasts” are the confidence intervals for the unknown values of  $y$  for a known set of  $x_i$ 's. Hence, this type of confidence intervals reflect not only the uncertainty of the estimated coefficients, but also the distribution of prediction errors. In other words, the “confidence intervals of forecasts” are constructed by using the  $\text{var}(y_i) = \text{var}(\hat{y}_i) + \text{var}(\varepsilon_i)$ , which is the sum of the variance of predictions and that of the errors. For the variance of the errors, the standard errors of regressions (SER) are normally used in the estimation that assumes homoskedasticity. In our estimation, however, we allow for heteroskedasticity, and thereby cannot use the SER. Hence, we instead use the standard deviations of the prediction errors from the last five-year period before the forecasted period. Because we make forecasts retroactively for the past periods and because we make modifications for the variance of the prediction errors (instead of using SER), we call our confidence intervals of forecast the “pseudo-confidence intervals of forecast.”

We investigate what factors contributed to the unexplainable component of the current account balances of our sample countries. While we include *PCGDP* in the estimation, this variable may not capture the robustness of the financial markets, but it would rather merely proxy for the extent of financial development. Some variables that represent exuberant financial markets may explain the unexplainable component of current accounts.

The recent pile-up of international reserves by emerging market countries has led many researchers to examine the determinants and the effects of international reserves holding. Some researchers focus on the mercantilist motive for holding international reserves (such as Aizenman and Marion, 2007). It is worthwhile of examining whether and to what extent international reserves holding affects the unexplainable part of current account balances in the period.

Monetary policy may have contributed to the imbalances of current accounts through stimulating absorption. Some researchers (such as Taylor, 2009) argue that the Fed maintained lax monetary policy for too long, thereby keeping the cost of capital too low and feeding speculative investment in real assets. By the same token, fiscal policy should be suspected as one of the contributors. However, since budget balances are already included in the original estimation model, we suspect whether the extent of procyclicality matters for current account balances.

Although Chinn and Wei (2009) show that the exchange rate regime does not affect the current account adjustment, it has been anecdotally argued that the type of the exchange rate regime affects the behavior of current accounts.

Lastly, we also investigate whether the performance of housing markets affects the current account balances. One may need to be careful about this factor since it is probably the least exogenous factor among the ones we have talked about. To much extent, the performance of housing markets is the outcome of monetary policy, financial regulations, and other macroeconomic and institutional factors. In fact, we have already investigated the impact of leveraging on current account balances in a previous subsection. However, although we do find that general household leveraging leads to worsening current account balances, we do not find any evidence for mortgage leveraging affecting current account balances. It is possible that rising housing prices may have caused wealth effect and consequently contributed to increasing domestic absorption. As many researchers have focused on the impact of the housing markets on current account balances (such as Aizenman and Jinjark, 2009 and Fratzscher and Straub, 2009), asset market booms can attract capital inflows, thus worsening current account balances, through increasing perceived levels of wealth.

A-Figure 6 presents scatter plots for the prediction errors and several variables of our interest, focusing the financial booming period. It appears that both real appreciation rate of housing prices and the growth rate of private bond market capitalization in the pre-crisis period of 2002-06 are negatively correlated with the prediction errors of current account balances. However, we cannot discern any (unconditional) correlations for stock market total values or public bond market capitalization.



We surely need to control for other conditions. Hence, we run the following estimation equation:

$$\hat{u}_{it} = \phi W_{it} + \theta D_i + \varepsilon_t . \quad (3)$$

$\hat{u}_{it}$  is the out-of-sample prediction errors from the estimation for the 2006-08 period with Model 2 for different subsamples.  $W_{it}$  is a vector of candidate variables that may explain the unexplainable component of current account balances. More specifically, it includes the following variables:

- Average change in stock market total value (*SMTV*) in 2002-06;<sup>44</sup>
- Average change in public bond market capitalization (*PBBM*) and private bond market capitalization (*PBBM*) in 2002-06;
- Fiscal procyclicality – the correlations between Hodrick-Prescott (HP)-detrended government spending series and HP-detrended real GDP series in 2006-08 (*FIS\_PRO*);
- Dummy for the fixed exchange rate regime (*FIX*) in 2006-08 – assigned the value of 1 if a country is categorized as the fixed exchange regime in the Rogoff-Reinhart exchange rate regime index (2008), zero, otherwise;<sup>45</sup>
- International reserves as a ratio to GDP (*IR*) as of 2005;
- Real interest rate (*Real\_Int*) – Lending rate minus the rate of inflation based on GDP deflators as of 2005;
- Average of the real housing appreciation (the growth rates of housing indexes adjusted for CPI-inflation) in 2002-06.<sup>46</sup>

$D_i$  is also included in the estimation to examine whether there are any country-specific effects for the countries that have experienced notable current account imbalances. We run the estimation as specified in equation (3) and report the results in A-Table 5. Since the number of observations is small – both private/public bond market capitalization variables and the housing price indexes are quite restrictive especially for non-industrial countries, we lump both industrialized and emerging market countries into one sample. Despite the small number of observations that makes us a little cautious about interpretation, we have some interesting results.

As one can expect, the performance of stock markets tends to worsen current account balances in the global imbalances period, though the level of statistical significance can differ across different models. Private and bond market performances do also seem to affect current account balances in this period. In sum, better performance in the financial markets appear to

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<sup>44</sup> While the stock market capitalization variable (*SMKC*) represents the level of stock market development in terms of the size (or depth), *SMTV* or stock market turnovers (*SMTO*) can be a measure of the activeness of stock markets. Both *SMKC* and *SMTO* are found to be consistently insignificant, and therefore, dropped from the estimation.

<sup>45</sup> The most frequent type of the exchange rate regime is chosen for the 2006-08 period. The type of the exchange rate regime is based on the “coarse version” of the Rogoff-Reinhart exchange rate regime index.

<sup>46</sup> We collected housing indexes for as many countries as possible, using the CEIC database, government statistical agencies, and other private organizations that keep track on housing prices. For several countries, we use the data provided by Joshua Aizenman and Yothin Jinjarak. The original data are available for 47 countries. While data availability varies widely among countries, the data for most of the countries are available after 1990. For this exercise, the average real growth rate of the housing indexes for the 2002-06 period is included. The choice of the period is driven by the facts that the last world recession occurred in 2001; the housing bubble peaked in 2006.

have contributed to more capital inflows, thus worsening current account balances in the global imbalances period. Unfortunately, the small sample size does not allow us to identify what type of financial market performance most affects the unusual performance of current account balances in this period. But given that the variable for the growth in stock market total values is more significant in the models that include the country dummies (with significant coefficients), we may conclude that stock market performance affects the unusual current account balances in the pre-crisis period. While fiscal procyclicality does not seem to affect the unexplainable component of current account balances, there is some evidence that monetary policy matters for current account balances. In the models that include the housing index, the real interest rates as of 2005 are found to be a negative contributor to the unexplainable part of current account balances despite the significant entry of the real housing appreciation variable. As was shown in A-Figure 6, real housing appreciation does negatively affect the unexplainable component of current account balances. Consistently with Aizenman and Jinjark, we can conclude that asset market boom tends to attract capital inflows. Despite much attention paid to the recent, rapid accumulation of international reserves, international reserves do not seem to contribute to the unexplainable component of current account balances.<sup>47</sup>

Despite all these explanatory variables, there is still an unexplainable component of current accounts for several countries with large current account imbalances, namely, the United States, China, Greece, and Iceland. This result may indicate that these countries need to implement policies that are particularly tailored for their country-specific situations that affect the saving and investment decisions.

### **Forecasts of Current Account Balances for 2012-16**

We now use these estimated relationships to forecast the prospects for global rebalancing. We construct forecasts of the independent variables out to the 2012-16 period and use our estimates from our baseline model to project values for the current account. The forecasts start with 2012, omitting the crisis years 2009-11, when behavior was unusual. The assumptions and the data for the out-of-sample projections are explained in Chinn et al. (2011).<sup>48</sup> We make two types of forecasts: one type is the forecasts we make using data through 2008 and the other is the forecasts we make using data only through 2005. Given the possibility of a structural break in 2006, the forecasts made with data through 2005 can be interpreted as the projections of the current account countries may experience if their economic conditions revert to the pre-global imbalances period. A-Figure 7 presents forecasts of current account balances for several countries which either contributed to the global imbalances or are experiencing debt crisis (as of the fall of 2011). The forecasts made using data up to 2008 are shown in the red line and the forecasts made using data through 2005 are shown in the grey line. One standard deviation

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<sup>47</sup> We also repeat the same exercise, but in a panel context, by using the retroactive prediction errors from Table 5 as the dependent variables and having the explanatory variables of equation 3 as the five-year averages. The results from this exercise (not reported) yield consistent results with those reported in Table 6. However, it must be noted that the data availability of the housing prices as well as bond market capitalization variables restrict the size of the sample significantly, making it composed of data mostly from the 1990s and of industrialized and emerging market countries.

<sup>48</sup> We use model 2 (including the institutional variables) and the separate estimates for industrial and emerging-market economies as the basis for our forecasts.

confidence intervals of forecast are also shown, that correspond to about 65% of probability of occurrence.

For the United States, the forecasts based on the data through 2008 in A-Figure 7 suggest its current account deficit stabilizes around 4% of GDP though the IMF projects it will significantly improve to 2%. The forecasts with the data through 2005 suggest even a deterioration of current accounts. However, although both models have the tendency of persistently underpredicting U.S. current account deficits, both of their predicted levels of current account balances end up getting close to the IMF projection.

A similar observation can be made for the UK; in either U.S. or U.K. case, the narrowing of current account deficits over the period is more limited than the IMF projection. The news for the surplus industrial countries, namely Japan and Germany, is even less reassuring. The forecasts suggest that their surpluses will remain stable or even rise further, absent additional policy changes. However, again, the IMF projects there will be more rebalancing for these countries.<sup>49</sup> Our model predict the European debt crisis countries will continue to run current account deficit, but the current debt crisis will probably cause these countries to experience rebalancing because of weakened demand by the crisis. Our results on leveraging may also fill the gap between the IMF projection and our prediction which does not incorporate leveraging/deleveraging effect. As we have been observing, the Euro crisis has led European countries to decrease their financial exposure; deleveraging is taking place on a large scale. If that is the case, current account deficit countries should experience an improvement in their current account balances as we found previously. Our results suggest that one percentage *decrease* in the growth rate of household leverage should lead to a 0.2 percentage point improvement in current account balances as the share of GDP.

Among emerging market countries with current account surpluses, our model predicts their surpluses slightly rise or remain constant. If the “East Asian effect” persists, the relatively stable predictions of their current account surpluses would mean their surpluses would persist. One interpretation is that the circle will be squared by other countries that will run smaller surpluses and offset America’s smaller deficits. That can be also applicable to China, but even a significant reduction in the surplus as projected by the IMF will still leave the country with a high level of surplus. A less reassuring interpretation is that the parts do not add up under current forecasts and that even partial rebalancing, possibly caused by the Euro/debt, will require further policy changes. Either way, it seems clear that imbalances will persist.

A-Table 6 reports the two types of forecasted current accounts for the countries for which the data are available to make forecasts, along with the 2006-08 level of current account balances and the IMF’s projection for the 2012-16 period. The table shows that the IMF projects a relatively high degree of rebalancing; it projects that the average current account surplus of the countries that ran current account surplus as of 2006-08 will shrink from 7.4% (as a share of GDP) to 5.7%. The average size of current account deficit is projected to improve significantly from -7.5% to -3.4%. The variation of current account balances is also expected to drop from 10.2% to 5.4%.

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<sup>49</sup> Japan’s rebalancing can be due to the earthquake/nuclear crisis in March 2011 which the IMF must incorporate in its projection.

Our forecasts present a somewhat different picture depending on the data to use for the forecasts. When we base our projection on data through 2008, the extent of rebalancing does not seem to be as promising as the IMF's projection. Our estimation using data up to 2008 ("Forecasts (2008)") predicts the degree of variation will drop by 3.2% (against the 4.8% drop of the IMF projection). The average size of current account surplus of the surplus countries will fall by 3.7% though we expect current account deficit improves by the same degree as the IMF projection. However, our forecasts based on data through 2005 suggest more rebalancing is on its way. The change in the extent of variation of current account balances is projected to drop by the same degree as the IMF's projection (4.6%). The average size of surplus of the surplus countries is expected to shrink much more than that of deficit of the deficit countries (-6.6% for surplus countries vs. +2.9% for deficit countries) compared to the IMF projections.

What do these results indicate? That our forecasts based on data through 2005 are closer to the IMF projection suggests that the IMF projection may be based on the assumption that countries will not revert to the economic situation that led to the unusual current account imbalances on the eve of the crisis. In other words, rebalancing of current accounts could only be achieved with the policies that would be more consistent with the economic environment of the pre-global imbalances period. However, it is also possible that the IMF projections incorporate more of what we do or cannot incorporate in our model, that is, the effect of Japan's crisis and the deterioration of the Euro debt crisis. These further suggest that unless countries implement drastic policy changes, the global imbalances may not disappear.

### **Fiscal Consolidation in the United States**

One of the big issues of macroeconomic management in coming years will be fiscal consolidation. The industrial countries have been trying to reduce budget deficits without nipping the green shoots of recovery. How will global imbalances evolve under different fiscal scenarios? A-Figure 8 presents different out-of-sample predictions for U.S. current account balances in the 2012-16 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 2012-16 period turns out to be higher than the average based on WEO projection (-6.2% of GDP) by three percentage points.<sup>50</sup> The pessimistic scenario is the case in which the 2012-16 average is lower than the WEO projection by three percentage points.

A-Figure 8 shows that a 3 percentage point difference in the fiscal balance relative to the baseline scenario would change the current account balance by 70 basis points, i.e., about three quarters of one 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.<sup>51,52</sup>

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<sup>50</sup> Three percentage points are equivalent to 1.5 standard deviations in the distribution of U.S. budget balances in the 1969 – 2008 period.

<sup>51</sup> Consistent with the Caballero et al. effect.

## What if China Liberalizes and Develops Its Financial Markets?

We can similarly consider alternative scenarios for financial development and capital account liberalization in China (A-Figure 9). The figure shows, for comparison, the same projection as in A-Figure 7 with the dotted grey line. It also shows the forecast if China's level of financial openness increases moderately to the level of Thailand in 2008 (blue). In this case the current account surplus falls significantly, in line with the predictions of the proponents of the saving glut argument. The figure also shows what happens when financial liberalization proceeds to Brazilian (green) and then Mexican (orange) levels.<sup>53</sup> 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.<sup>54</sup>

A-Figure 10 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.<sup>55</sup> 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 2016 under this scenario is at least as much an artifact of this under-prediction 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 (blue dotted line that almost overlaps the grey one) 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.<sup>56</sup> However, as we saw previously, our estimation model consistently underpredicts

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<sup>52</sup> However, one factor that may improve U.S. current account balances would be the ongoing deleveraging efforts by U.S. households. Given the magnitude of the increase in the level of household leverage prior to the crisis, and given the significant impact of the financial crisis especially on the labor market, it is likely that deleveraging will contribute to improving the U.S. current account balance.

<sup>53</sup> 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 financial openness as of 2008. The average of KAOPEN for the LDC group as of 2008 is 50.2 whereas that for the EMG group is 60.9.

<sup>54</sup> 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 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.

<sup>55</sup> Recall that in our empirical model all variables are normalized by the world average.

<sup>56</sup> 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.

China's current account surplus. This indicates that, besides financial development and liberalization, other policies specific to China's situation will be necessary.<sup>57</sup>

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<sup>57</sup> For example, how and by how much the government implements a rule that requires state-owned enterprises to pay dividends to the government can be an important policy to help reduce the enormous corporate sector saving in the country (See Ma and Wang, 2010 and Kuijs, 2006, Chinn and Ito, 2011).

**A-Table 1: 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 [0.064]***	0.414 [0.086]***	0.28 [0.068]***	0.121 [0.065]*
Net foreign assets (initial)	0.039 [0.005]***	0.089 [0.014]***	0.029 [0.006]***	0.023 [0.013]*
Relative income	0.058 [0.015]***	0.023 [0.017]	0.097 [0.020]***	0.226 [0.090]**
Relative income squared	0.073 [0.019]***	-0.104 [0.082]	0.072 [0.018]***	0.141 [0.079]*
Dependency ratio (young)	-0.045 [0.015]***	0.012 [0.023]	-0.034 [0.017]**	-0.02 [0.018]
Dependency ratio (old)	-0.026 [0.009]***	0.013 [0.017]	-0.025 [0.011]**	-0.055 [0.019]***
Financial Develop. (PCGDP)	-0.016 [0.011]	-0.025 [0.016]	0.012 [0.013]	-0.008 [0.016]
TOT volatility	0.007 [0.020]	-0.1 [0.053]*	-0.009 [0.022]	-0.005 [0.024]
Avg. GDP growth	-0.183 [0.121]	0.056 [0.173]	-0.207 [0.132]	0.033 [0.121]
Trade openness	-0.001 [0.006]	-0.013 [0.013]	-0.014 [0.008]*	-0.017 [0.010]*
Oil exporting countries	0.034 [0.013]***	– –	0.033 [0.013]***	0.057 [0.016]***
Dummy for 2001-05	0.014 [0.011]	0.023 [0.010]**	0.017 [0.018]	0.039 [0.017]**
Dummy for 2006-08	0.007 [0.013]	0.01 [0.011]	0.015 [0.020]	0.021 [0.021]
Observations	670	180	491	257
Adjusted R-squared	0.45	0.5	0.47	0.43

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.

**A-Table 2-1: 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 [0.058]***	0.289 [0.086]***	0.279 [0.063]***	0.094 [0.054]*
Net foreign assets (initial)	0.037 [0.006]***	0.078 [0.008]***	0.028 [0.007]***	0.026 [0.012]**
Relative income	0.09 [0.018]***	0.018 [0.022]	0.135 [0.022]***	0.284 [0.093]***
Relative income squared	0.055 [0.018]***	0.02 [0.094]	0.046 [0.017]***	0.16 [0.081]*
Dependency ratio (young)	-0.033 [0.015]**	0.004 [0.025]	-0.029 [0.017]*	-0.029 [0.019]
Dependency ratio (old)	-0.019 [0.010]**	0.057 [0.021]***	-0.022 [0.011]**	-0.068 [0.020]***
Financial Develop. (PCGDP)	-0.027 [0.014]*	-0.02 [0.010]*	0 [0.029]	-0.117 [0.038]***
Legal development (LEGAL)	-0.008 [0.005]*	0.015 [0.005]***	-0.015 [0.007]**	-0.018 [0.012]
PCGDP x LEGAL	-0.011 [0.008]	-0.014 [0.012]	-0.007 [0.008]	-0.032 [0.014]**
Financial open. (KAOPEN)	0.002 [0.005]	0.008 [0.004]*	-0.009 [0.008]	-0.008 [0.009]
KAOPEN x LEGAL	0.003 [0.001]***	0.012 [0.003]***	-0.001 [0.002]	0.004 [0.003]
KAOPEN x PCGDP	0.002 [0.007]	0.028 [0.010]***	0.003 [0.008]	-0.02 [0.010]*
TOT volatility	0 [0.023]	0.028 [0.047]	-0.01 [0.024]	0.023 [0.025]
Avg. GDP growth	-0.097 [0.091]	0.178 [0.178]	-0.09 [0.099]	0.072 [0.117]
Trade openness	-0.001 [0.006]	-0.001 [0.011]	-0.005 [0.010]	0 [0.012]
Oil exporting countries	0.028 [0.013]**	–	0.025 [0.012]**	0.045 [0.016]***
Dummy for 2001-05	0.025 [0.009]***	0.015 [0.009]*	0.033 [0.015]**	0.041 [0.017]**
Dummy for 2006-08	0.017 [0.011]	0.002 [0.010]	0.032 [0.018]*	0.019 [0.022]
Observations	621	174	447	250
Adjusted R-squared	0.5	0.63	0.52	0.46

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.



**A-Table 2-2: 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	0.432 [0.111]***	0.476 [0.087]***	0.419 [0.121]***	0.2 [0.071]***	0.033 [0.034]	0.304 [0.126]**	0.022 [0.033]	-0.011 [0.061]
Net foreign assets (initial)	0.022 [0.014]	0.072 [0.008]***	0.017 [0.015]	0.053 [0.015]***	-0.007 [0.004]*	-0.014 [0.010]	-0.003 [0.005]	0.012 [0.013]
Relative income	0.015 [0.034]	0 [0.027]	0.036 [0.044]	-0.054 [0.093]	-0.037 [0.018]**	-0.006 [0.032]	-0.051 [0.022]**	-0.264 [0.075]***
Relative income squared	0.054 [0.035]	-0.176 [0.116]	0.063 [0.031]**	-0.238 [0.097]**	0 [0.018]	-0.225 [0.155]	0.019 [0.018]	-0.342 [0.071]***
Dependency ratio (young)	-0.06 [0.017]***	-0.088 [0.025]***	-0.035 [0.022]	-0.057 [0.020]***	-0.05 [0.013]***	-0.097 [0.026]***	-0.033 [0.014]**	-0.046 [0.018]**
Dependency ratio (old)	-0.019 [0.015]	-0.017 [0.021]	-0.007 [0.017]	-0.083 [0.020]***	-0.006 [0.009]	-0.058 [0.020]***	0.006 [0.010]	-0.013 [0.019]
Financial Develop. (PCGDP)	0.02 [0.017]	0.017 [0.011]	0.073 [0.059]	-0.091 [0.053]*	0.037 [0.008]***	0.026 [0.012]**	0.073 [0.031]**	0.046 [0.043]
Legal development (LEGAL)	-0.012 [0.007]*	0.011 [0.006]*	-0.019 [0.012]	-0.034 [0.015]**	-0.002 [0.004]	-0.01 [0.006]*	0.007 [0.008]	-0.015 [0.014]
PCGDP x LEGAL	-0.02 [0.008]**	-0.028 [0.013]**	-0.016 [0.014]	-0.045 [0.018]**	0 [0.004]	-0.003 [0.012]	0.013 [0.010]	0.001 [0.015]
Financial open. (KAOPEN)	-0.004 [0.006]	-0.004 [0.005]	-0.013 [0.012]	-0.001 [0.010]	-0.011 [0.003]***	-0.01 [0.003]***	-0.016 [0.006]**	-0.006 [0.007]
KAOPEN x LEGAL	-0.002 [0.001]	0.01 [0.003]***	-0.006 [0.004]	0.003 [0.004]	-0.003 [0.001]***	0.003 [0.005]	-0.005 [0.002]**	-0.004 [0.003]
KAOPEN x PCGDP	0.007 [0.009]	0.009 [0.011]	0.012 [0.014]	-0.011 [0.014]	-0.001 [0.005]	-0.003 [0.011]	-0.004 [0.008]	0.002 [0.012]
TOT volatility	-0.024 [0.039]	0.314 [0.053]***	-0.051 [0.044]	-0.066 [0.035]*	0.017 [0.022]	0.252 [0.045]***	-0.003 [0.025]	-0.052 [0.031]*
Avg. GDP growth	0.692 [0.165]***	0.417 [0.252]	0.695 [0.190]***	1.129 [0.169]***	0.951 [0.094]***	0.38 [0.268]	0.944 [0.097]***	1.143 [0.127]***
Trade openness	0.021 [0.007]***	0.033 [0.016]**	0.024 [0.013]*	0.033 [0.012]***	0.02 [0.005]***	0.023 [0.012]*	0.025 [0.008]***	0.035 [0.009]***
Oil exporting countries	0.078 [0.018]***	– [0.016]**	0.086 [0.020]***	0.032 [0.017]*	0.049 [0.012]***	– [0.012]***	0.059 [0.011]***	0.01 [0.015]
Dummy for 2001-05	0.007 [0.013]	-0.053 [0.012]***	0.062 [0.017]***	0.048 [0.020]**	-0.028 [0.014]*	-0.08 [0.021]***	0.013 [0.014]	-0.005 [0.018]
Dummy for 2006-08	0.027 [0.015]*	-0.041 [0.012]***	0.097 [0.023]***	0.045 [0.026]*	-0.011 [0.015]	-0.058 [0.020]***	0.031 [0.016]*	0.014 [0.020]
Observations	621	174	447	250	621	174	447	250
Adjusted R-squared	0.46	0.63	0.49	0.57	0.35	0.46	0.39	0.5

**A-Table 3: Beta Coefficients in the Current Account Regression**

	Full (1)	IDC (2)	LDC (3)	EMG (4)
Gov't budget balance	0.269***	0.223***	0.260***	0.005*
NFA (initial cond.)	0.363***	0.543***	0.279***	0.013**
Relative Income	0.229**	0.057	0.266***	0.025***
Relative Income, sq.	0.079***	0.009	0.032***	0.006**
Relative Dependency Ratio (young)	-0.206**	0.013	-0.121*	-0.009
Relative Dependency Ratio (old)	-0.158**	0.204***	-0.113**	-0.024***
Financial Development (PCGDP)	-0.036	-0.245	0.044	-0.005
LEGAL	-0.164**	-0.053	-0.196**	-0.007
PCGDP x LEGAL	-0.105	-0.177	-0.047	-0.017**
Financial openness (KAOPEN)	-0.104**	-0.612**	-0.173***	-0.006
KAOPEN x LEGAL	0.095***	0.560***	-0.021	0.008
KAOPEN x PCGDP	0.018	0.309***	0.017	-0.010*
TOT volatility	0.001	0.034	-0.017	0.003
output growth, 5-yr average	-0.037	0.053	-0.035	0.002
Trade Openness	-0.007	-0.010	-0.032	0.000
Oil Exporters	0.110**		0.106**	0.012***
Dummy-2005	0.126***	0.104*	0.156**	0.014**
Dummy-2008	0.076	0.011	0.129*	0.006

Notes: \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . The p-values are not necessarily similar to those in Table 2-1 since both the dependent and independent variables are standardized in this estimation. Time fixed effects are included in the estimation, but only those for the 2001-05 and 2006-08 periods are reported in the table. The estimates shown here are “beta coefficients” which indicate by how many standard deviations the current account balances would change if an explanatory variable changes by one standard deviation.

**A-Table 4: Impacts of “Leveraging” on Current Account Balances**

	HH-leverage1 (1)	HH-leverage2 (2)	Gov't-leverage (3)	HH lev.1 & G-leverage (4)	HH lev.2 & G-leverage (5)	HH-lev.1 w/ int. (6)	HH-lev.2 w/ int. (7)	G-lev. w/ int. (8)	HH & G-lev.1 w/ int. (9)	HH & G-lev.2 w/ int. (10)
Gov't budget balance	0.431 (0.115)***	0.405 (0.316)	0.331 (0.088)***	0.582 (0.121)***	0.763 (0.529)	0.438 (0.120)***	0.389 (0.280)	0.337 (0.087)***	0.619 (0.125)***	0.687 (0.416)
Lane's NFA (initial cond.)	0.046 (0.010)***	0.006 (0.026)	0.084 (0.009)***	0.047 (0.009)***	0.007 (0.023)	0.046 (0.010)***	-0.004 (0.025)	0.076 (0.010)***	0.046 (0.010)***	-0.008 (0.019)
Relative income	0.030 (0.041)	0.102 (0.056)*	0.030 (0.022)	-0.002 (0.037)	0.095 (0.051)*	0.029 (0.042)	0.106 (0.052)*	0.043 (0.023)*	-0.008 (0.040)	0.101 (0.042)**
Relative income sq.	0.057 (0.101)	-0.150 (0.196)	-0.011 (0.071)	0.014 (0.091)	-0.133 (0.213)	0.059 (0.102)	-0.189 (0.202)	0.017 (0.066)	0.020 (0.107)	-0.128 (0.179)
Young dependency ratio	-0.074 (0.040)*	-0.001 (0.061)	-0.041 (0.026)	-0.065 (0.038)*	-0.000 (0.062)	-0.076 (0.041)*	-0.001 (0.060)	-0.025 (0.024)	-0.064 (0.039)	-0.006 (0.059)
Old dependency ratio	0.045 (0.030)	0.187 (0.056)***	0.003 (0.020)	0.052 (0.030)*	0.192 (0.056)***	0.043 (0.031)	0.146 (0.054)**	0.006 (0.018)	0.044 (0.031)	0.208 (0.043)***
Fin Dev. - PCGDP	-0.027 (0.012)**	-0.020 (0.029)	-0.016 (0.011)	-0.036 (0.012)***	-0.022 (0.028)	-0.028 (0.013)**	-0.022 (0.026)	-0.010 (0.011)	-0.040 (0.012)***	-0.010 (0.023)
Legal/Institutional variable	0.021 (0.005)***	0.032 (0.012)**	0.006 (0.006)	0.028 (0.007)***	0.032 (0.012)**	0.021 (0.005)***	0.024 (0.014)*	0.004 (0.005)	0.028 (0.006)***	0.025 (0.013)*
pcgdp x legal	0.036 (0.014)**	0.045 (0.015)***	-0.019 (0.013)	0.047 (0.011)***	0.050 (0.015)***	0.036 (0.014)**	0.046 (0.016)***	-0.013 (0.010)	0.051 (0.012)***	0.053 (0.014)***
Financial Openness (KAOPEN)	0.006 (0.011)	-0.022 (0.024)	0.004 (0.004)	0.001 (0.011)	-0.025 (0.025)	0.007 (0.011)	-0.026 (0.024)	0.002 (0.003)	0.002 (0.011)	-0.041 (0.021)*
KAOPEN x legal	0.029 (0.008)***	0.027 (0.016)	0.016 (0.004)***	0.019 (0.008)**	0.019 (0.019)	0.029 (0.008)***	0.024 (0.015)	0.015 (0.003)***	0.017 (0.008)**	0.027 (0.017)
KAOPEN x pcgdp	-0.022 (0.011)*	-0.021 (0.036)	0.004 (0.011)	-0.025 (0.009)***	-0.022 (0.038)	-0.022 (0.011)*	-0.030 (0.038)	-0.000 (0.008)	-0.027 (0.011)**	-0.051 (0.031)
Dummy-2005	0.012 (0.009)	0.001 (0.011)	0.010 (0.008)	0.010 (0.009)	-0.008 (0.015)	0.012 (0.009)	0.002 (0.011)	0.007 (0.007)	0.009 (0.010)	-0.001 (0.014)
Dummy-2008	0.002 (0.010)	-0.009 (0.013)	0.002 (0.010)	0.007 (0.008)	-0.013 (0.014)	0.005 (0.012)	0.011 (0.017)	-0.001 (0.010)	0.018 (0.011)	0.009 (0.016)
HH's leverage 1	-0.183 (0.109)*			-0.248 (0.091)***		-0.177 (0.109) <sup>11%</sup>			-0.243 (0.090)***	
HH's leverage 2 (mortgage)		0.029 (0.052)			-0.001 (0.060)		0.005 (0.060)			-0.012 (0.065)
Gov't's leverage			-0.097 (0.050)*	0.178 (0.078)**	0.277 (0.237)			-0.009 (0.042)	0.190 (0.097)*	0.057 (0.216)
HH-lev1 x d2008						-0.044 (0.073)			-0.121 (0.069)*	
HH-lev2 x d2008							-0.200 (0.153)			-0.137 (0.111)
Gov't-lev x d2008								-0.354 (0.120)***	-0.004 (0.130)	0.533 (0.214)**
$R^2$	0.90	0.91	0.72	0.91	0.92	0.90	0.92	0.75	0.92	0.94
$N$	65	40	148	65	40	65	40	148	65	40

Notes: \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ . The estimates for GDP growth, TOT volatility, and trade openness are omitted to conserve space.

**A-Table 5: Determinants of the Out-of-Sample Prediction Errors of CAB**

<i>Dependent variable = Out-of-sample Prediction errors</i>									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Average Change in Stock market development (SMTV) in 2002-06	-0.319 [0.133]**	-0.295 [0.130]**	-0.128 [0.101]	-0.225 [0.132]*	-0.060 (0.078)	-0.117 (0.092)	-0.102 (0.080)	-0.168 (0.100)	-0.060 (0.078)
Fiscal Procyclicality in 2006-08	-0.006 [0.017]	-0.022 [0.018]	0.011 [0.016]	-0.005 [0.018]	0.015 (0.014)	0.003 (0.016)	0.014 (0.013)	-0.001 (0.015)	0.015 (0.014)
Dummy for the Fixed/Pegged Exchange Rate Regime	-0.037 [0.022]*	-0.046 [0.023]*	-0.019 [0.018] <sup>12%</sup>	-0.028 [0.017]	-0.021 (0.015)	-0.029 (0.014)*	-0.013 (0.016)	-0.021 (0.015)	-0.021 (0.015)
Int'l Reserves (% of GDP) as of 2005	0.093 [0.050]*	0.051 [0.045]	0.083 [0.057]	0.05 [0.043]	0.015 (0.041)	-0.004 (0.039)	0.050 (0.049)	0.030 (0.039)	0.015 (0.041)
Real Interest Rate as of 2005	-0.083 [0.117]	-0.054 [0.115]	-0.051 [0.071]	-0.045 [0.074]	-0.125 (0.069)*	-0.117 (0.076)	-0.137 (0.072)*	-0.121 (0.073)	-0.125 (0.069)*
Average Change in Private bond market development (PVBM) in 2002-06			-0.281 [0.055]***	-0.617 [0.318]*				-0.421 (0.234)*	-0.438 (0.245)*
Average Change in Public bond market development (PBBM) in 2002-06			-0.065 [0.238]	-0.218 [0.252]				-0.484 (0.192)**	-0.528 (0.193)**
Average Housing Appreciation Rate in 2002-06						-0.730 (0.163)***	-0.698 (0.175)***	-0.656 (0.121)***	-0.593 (0.115)***
Dummy for the U.S.		-0.118 [0.037]***		-0.071 [0.034]**			-0.066 (0.030)**		-0.062 (0.031)*
Dummy for China		0.111 [0.022]***		0.103 [0.017]***			0.068 (0.011)***		0.075 (0.012)***
Dummy for Greece		-0.065 [0.023]***		-0.064 [0.018]***			-0.050 (0.014)***		-0.065 (0.012)***
Dummy for Iceland		-0.121 [0.035]***		0.193 [0.173]			-- --		-- --
Observations	58	58	36	36	35	35	35	31	31
Adjusted R-squared	0.20	0.31	0.47	0.61	0.56	0.62	0.57	0.69	0.56

Notes: Robust standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1

**A-Table 6: Forecasts of Current Account Balances for 2012-16**

	<b>CAB as of 2006-08</b>	<b>IMF Projection for 2012-16</b>	<b>Change from 2006-08</b>	<b>Forecast (2008)<sup>n</sup></b>	<b>Change from 2006-08</b>	<b>Difference from IMF projection</b>	<b>Forecast (2005)<sup>n</sup></b>	<b>Change from 2006-08</b>	<b>Difference from IMF projection</b>
	(1)	(2)	(3)=(2)-(1)	(4)	(5)=(4)-(1)	(6)=(4)-(2)	(7)	(8)=(7)-(1)	(9)=(7)-(2)
<i>Industrial Countries</i>									
Australia	-5.7%	-5.6%	0.1%	-4.2%	1.5%	1.5%	-4.4%	1.3%	1.2%
Austria	3.0%	2.8%	-0.2%	0.2%	-2.8%	-2.6%	-0.6%	-3.6%	-3.4%
Belgium	0.4%	1.7%	1.3%	2.8%	2.4%	1.1%	1.8%	1.4%	0.1%
Canada	2.2%	-3.0%	-5.3%	0.0%	-2.2%	3.1%	-0.4%	-2.7%	2.6%
Denmark	1.9%	5.9%	4.0%	0.8%	-1.1%	-5.1%	-0.4%	-2.3%	-6.3%
Finland	3.9%	2.5%	-1.4%	4.5%	0.7%	2.0%	1.4%	-2.4%	-1.0%
France	-1.2%	-2.5%	-1.3%	0.1%	1.4%	2.6%	-1.2%	0.0%	1.3%
Germany	7.0%	4.5%	-2.5%	2.8%	-4.2%	-1.8%	1.4%	-5.6%	-3.1%
Greece	-13.2%	-4.8%	8.5%	-10.5%	2.7%	-5.8%	-8.5%	4.7%	-3.7%
Iceland	-27.8%	0.0%	27.7%	-22.1%	5.6%	-22.1%	-13.0%	14.8%	-13.0%
Ireland	-4.5%	1.4%	5.9%	-4.6%	-0.1%	-6.0%	-3.9%	0.6%	-5.3%
Italy	-2.8%	-2.3%	0.5%	-3.9%	-1.1%	-1.6%	-3.3%	-0.4%	-1.0%
Japan	4.0%	2.5%	-1.5%	3.9%	0.0%	1.4%	1.7%	-2.3%	-0.8%
Malta	-7.7%	-5.6%	2.2%	-2.4%	5.3%	3.1%	-1.1%	6.6%	4.5%
Netherlands	8.3%	6.8%	-1.4%	1.1%	-7.2%	-5.7%	0.3%	-7.9%	-6.5%
New Zealand	-8.3%	-6.4%	1.9%	-5.7%	2.6%	0.7%	-6.2%	2.2%	0.2%
Norway	17.1%	11.7%	-5.4%	11.7%	-5.4%	0.0%	8.9%	-8.2%	-2.8%
Portugal	-10.6%	-4.5%	6.0%	-7.5%	3.1%	-2.9%	-6.8%	3.8%	-2.2%
Spain	-9.6%	-2.6%	7.0%	-6.4%	3.2%	-3.8%	-5.9%	3.7%	-3.3%
Sweden	8.5%	5.0%	-3.5%	4.5%	-4.0%	-0.5%	2.0%	-6.5%	-3.0%
Switzerland	11.1%	10.5%	-0.6%	12.6%	1.5%	2.1%	10.0%	-1.1%	-0.5%
United Kingdom	-2.6%	-1.3%	1.3%	-0.8%	1.8%	0.5%	-1.7%	0.9%	-0.4%
United States	-5.4%	-2.1%	3.2%	-3.8%	1.5%	-1.7%	-3.4%	2.0%	-1.3%
<i>Emerging Market Economies</i>									
Argentina	2.9%	-1.1%	-3.9%	0.5%	-2.4%	1.6%	-2.5%	-5.4%	-1.4%
Bangladesh	1.5%	-0.7%	-2.2%	0.0%	-1.5%	0.7%	-2.6%	-4.1%	-1.9%
Botswana	13.7%	0.8%	-13.0%	7.5%	-6.3%	6.7%	2.1%	-11.6%	1.3%
Brazil	-0.1%	-3.0%	-2.9%	-0.8%	-0.6%	2.2%	-3.9%	-3.7%	-0.9%
Bulgaria	-23.0%	-2.1%	21.0%	-5.0%	18.1%	-2.9%	-6.9%	16.1%	-4.8%
Cote d'Ivoire	1.4%	-2.1%	-3.4%	-3.0%	-4.4%	-0.9%	-5.3%	-6.6%	-3.2%
Chile	2.4%	-1.9%	-4.3%	2.1%	-0.3%	4.0%	-1.5%	-3.9%	0.4%
China	10.1%	6.5%	-3.6%	2.6%	-7.5%	-3.9%	0.1%	-10.0%	-6.5%
Colombia	-2.5%	-2.2%	0.3%	-1.3%	1.2%	0.9%	-4.2%	-1.7%	-2.0%
Ecuador	3.2%	-3.3%	-6.5%	-3.3%	-6.5%	0.0%	-7.0%	-10.1%	-3.6%

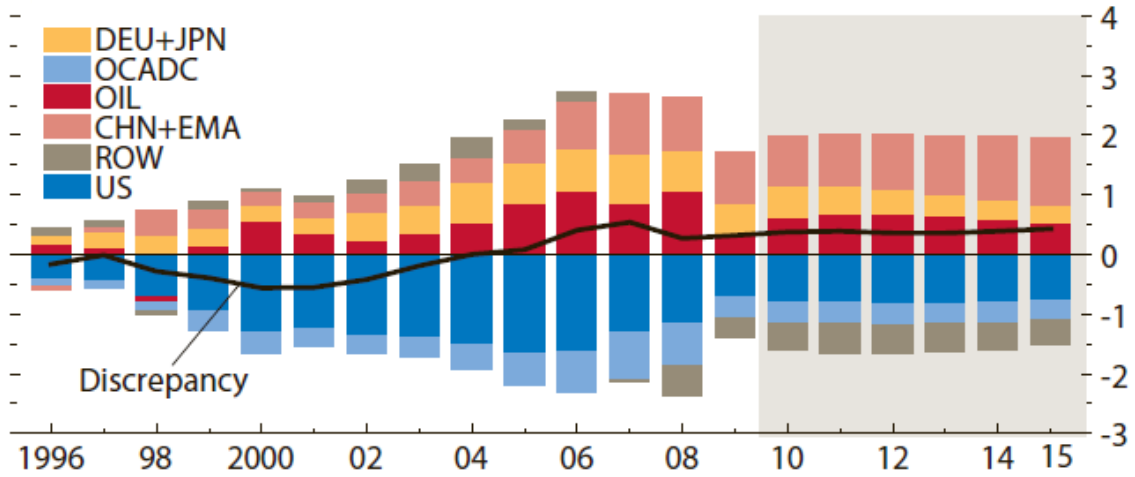
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**A-Table 6 (continued): Forecasts of Current Account Balances for 2012-16**

	<b>CAB as of 2006-08</b>	<b>IMF Projection for 2012-16</b>	<b>Change from 2006-08</b>	<b>Forecast (2008)<sup>n</sup></b>	<b>Change from 2006-08</b>	<b>Difference from IMF projection</b>	<b>Forecast (2005)<sup>n</sup></b>	<b>Change from 2006-08</b>	<b>Difference from IMF projection</b>
	(1)	(2)	(3)=(2)-(1)	(4)	(5)=(4)-(1)	(6)=(4)-(2)	(7)	(8)=(7)-(1)	(9)=(7)-(2)
Egypt, Arab Rep.	0.6%	-2.1%	-2.7%	-1.7%	-2.3%	0.4%	-4.2%	-4.8%	-2.1%
Ghana	-14.8%	-2.5%	12.4%	-3.7%	11.2%	-1.2%	-5.6%	9.2%	-3.2%
Hong Kong, China	12.9%	6.4%	-6.5%	25.8%	12.9%	19.4%	21.0%	8.1%	14.6%
Hungary	-7.5%	-0.3%	7.2%	-2.5%	5.0%	-2.3%	-5.8%	1.7%	-5.6%
India	-1.7%	-2.3%	-0.6%	-0.3%	1.3%	1.9%	-2.7%	-1.0%	-0.4%
Indonesia	1.8%	-0.9%	-2.7%	-1.9%	-3.7%	-1.0%	-5.6%	-7.5%	-4.8%
Israel	2.8%	1.4%	-1.4%	0.4%	-2.4%	-1.0%	-1.8%	-4.6%	-3.2%
Jamaica	-14.5%	-5.1%	9.4%	-4.2%	10.2%	0.9%	-7.1%	7.3%	-2.0%
Jordan	-13.2%	-6.5%	6.7%	-1.6%	11.6%	4.8%	-3.2%	10.0%	3.3%
Kenya	-4.0%	-6.1%	-2.2%	0.1%	4.1%	6.2%	-3.3%	0.7%	2.9%
Korea, Rep.	0.1%	1.2%	1.1%	6.7%	6.5%	5.5%	3.1%	3.0%	1.9%
Malaysia	17.3%	9.6%	-7.6%	2.5%	-14.8%	-7.2%	0.0%	-17.2%	-9.6%
Mexico	-0.9%	-0.9%	0.0%	0.1%	1.0%	1.0%	-4.1%	-3.2%	-3.2%
Morocco	-1.5%	-3.1%	-1.6%	-0.9%	0.6%	2.2%	-2.9%	-1.3%	0.3%
Nigeria	19.3%	8.2%	-11.1%	-1.3%	-20.6%	-9.5%	-4.1%	-23.4%	-12.3%
Pakistan	-6.8%	-2.5%	4.3%	-1.6%	5.1%	0.9%	-3.7%	3.1%	-1.2%
Peru	0.4%	-2.7%	-3.1%	-1.5%	-1.9%	1.2%	-5.6%	-6.0%	-2.9%
Philippines	4.0%	1.3%	-2.7%	-2.1%	-6.1%	-3.3%	-4.5%	-8.5%	-5.8%
Poland	-4.3%	-5.2%	-0.9%	-0.7%	3.6%	4.6%	-3.7%	0.6%	1.5%
Singapore	19.9%	16.3%	-3.6%	27.6%	7.7%	11.3%	20.0%	0.1%	3.7%
South Africa	-7.1%	-4.9%	2.2%	1.5%	8.5%	6.4%	-1.4%	5.6%	3.5%
Sri Lanka	-6.3%	-3.1%	3.2%	-4.5%	1.8%	-1.3%	-6.2%	0.1%	-3.1%
Thailand	2.6%	1.1%	-1.5%	-0.5%	-3.1%	-1.6%	-2.9%	-5.5%	-4.0%
Trinidad and Tobago	31.9%	17.9%	-13.9%	7.5%	-24.4%	-10.5%	0.4%	-31.5%	-17.5%
Tunisia	-2.9%	-4.7%	-1.7%	-0.2%	2.8%	4.5%	-3.7%	-0.7%	1.0%
Turkey	-5.7%	-6.9%	-1.2%	-0.9%	4.7%	5.9%	-3.8%	1.9%	3.1%
Venezuela, RB	12.0%	4.2%	-7.8%	0.5%	-11.5%	-3.7%	-2.1%	-14.1%	-6.3%
Average	0.2%	0.2%	0.0%	0.2%	0.0%	0.0%	-1.8%	-2.0%	-2.0%
Standard Deviation	10.2%	5.4%	-4.8%	7.0%	-3.2%	1.6%	5.6%	-4.6%	0.2%
Avg. of Surplus Countries <sup>n</sup>	7.4%	3.6%	-3.8%	3.7%	-3.7%	0.1%	0.8%	-6.6%	-2.8%
S.D. of Surplus Countries <sup>n</sup>	7.6%	5.5%	-2.1%	7.3%	-0.3%	1.8%	6.5%	-1.1%	1.0%
Avg. of Deficit Countries <sup>n</sup>	-7.5%	-3.4%	4.1%	-3.4%	4.1%	0.0%	-4.5%	2.9%	-1.2%
S.D. of Deficit Countries <sup>n</sup>	6.5%	2.1%	-4.4%	4.5%	-2.0%	2.4%	2.5%	-4.0%	0.3%

Notes: “Forecast (2008)” and “Forecast (2005)” are the forecasts made using data through 2008 and 2005, respectively. “Surplus countries” refer to the countries that ran current account surplus in the 2006-08 period, and “deficit countries” to those which ran current account deficit in the period. IMF projections are extracted from WEO September 2011

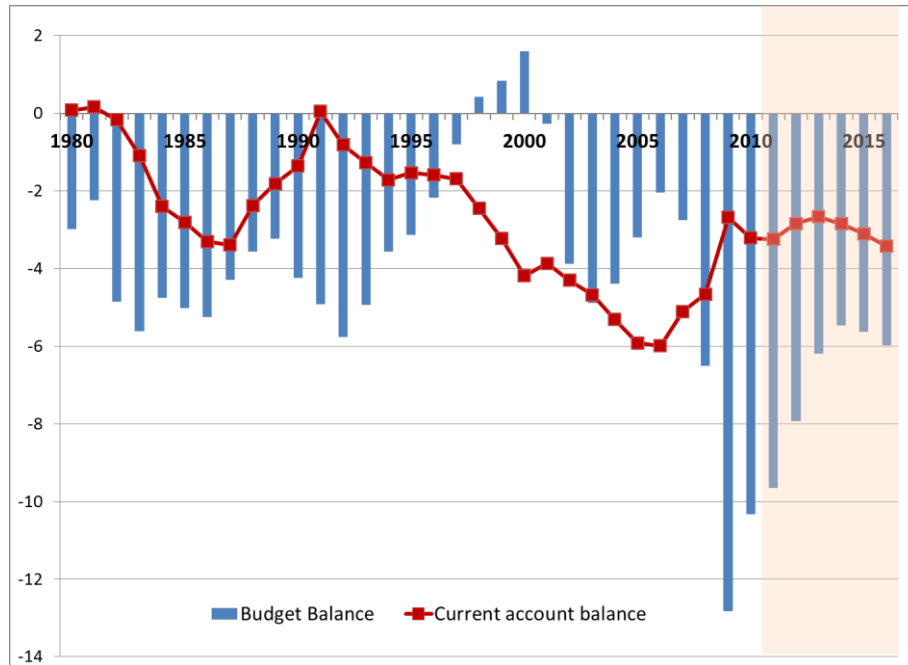
**A-Figure 1: Current Account Balances as a Share of World GDP**



Source: IMF, *World Economic Outlook*, September 2011.

Notes: 2011-2016 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 (as defined in WEO), 'CHN+EMA' is China plus other emerging Asia, and 'ROW' is rest of the world.

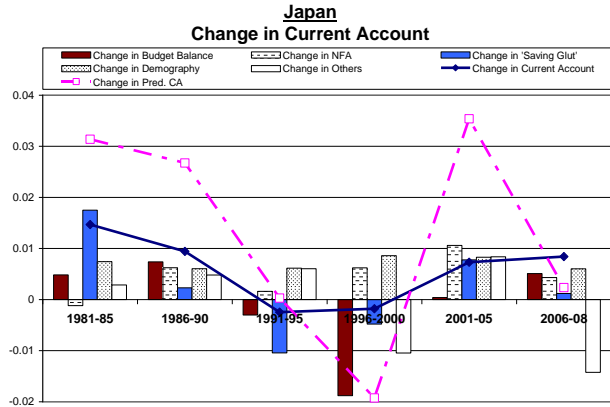
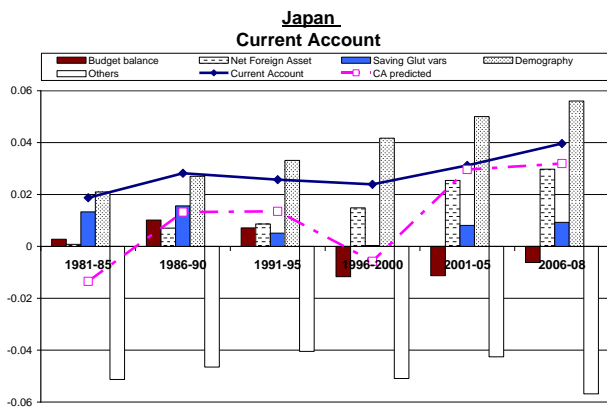
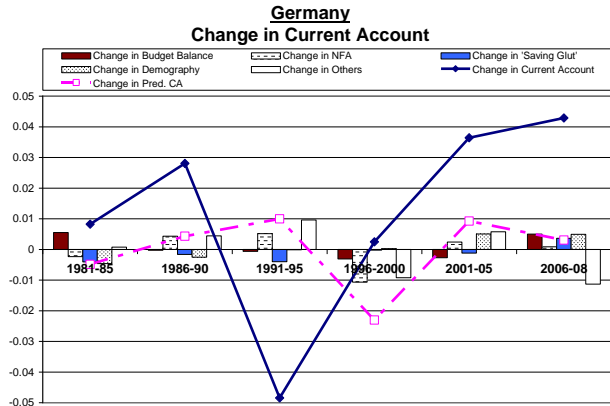
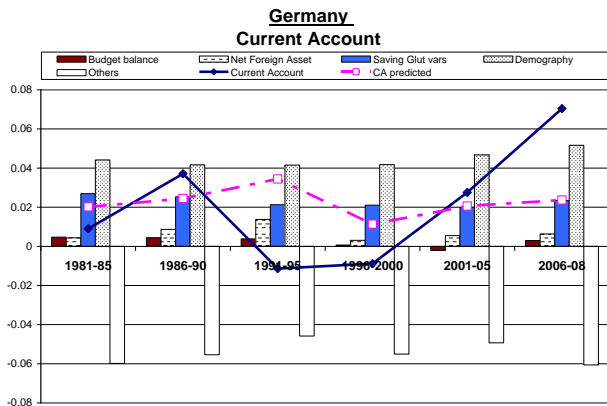
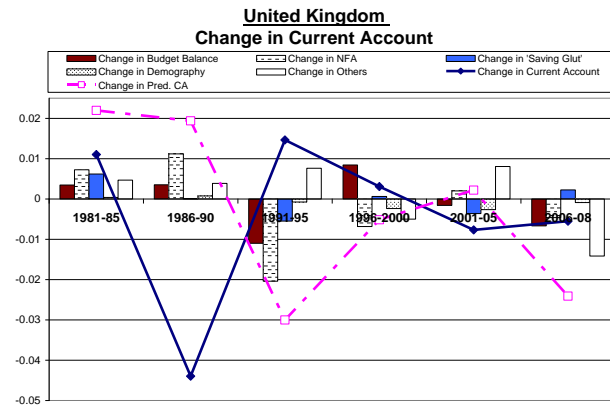
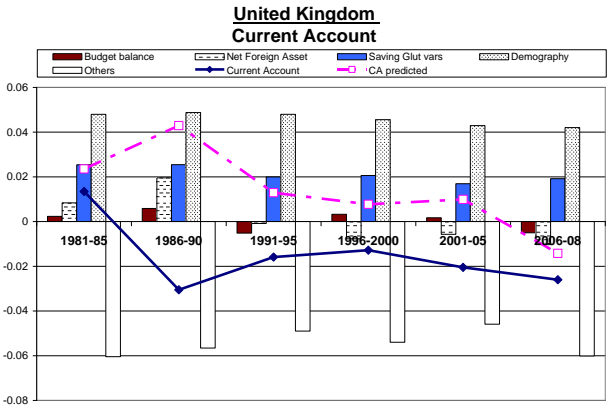
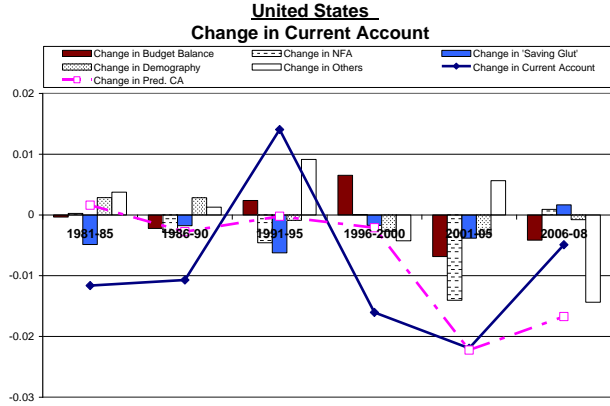
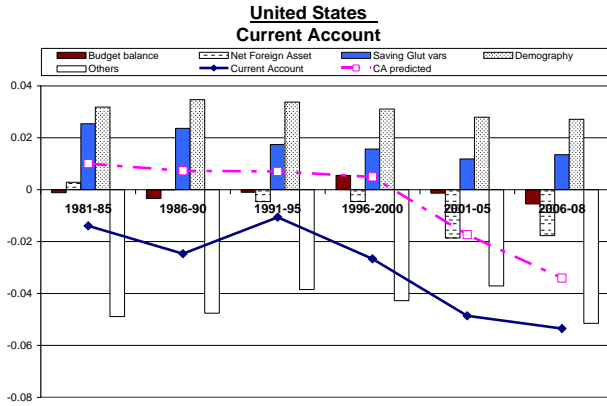
**A-Figure 2: U.S. Budget and Current Account Balances (% of GDP)**



Note: 2010-2016 data are IMF projections.

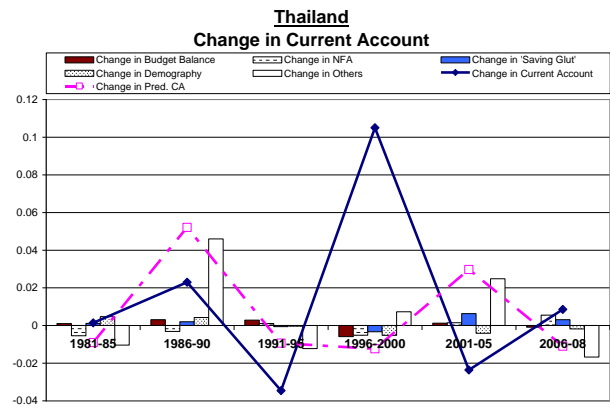
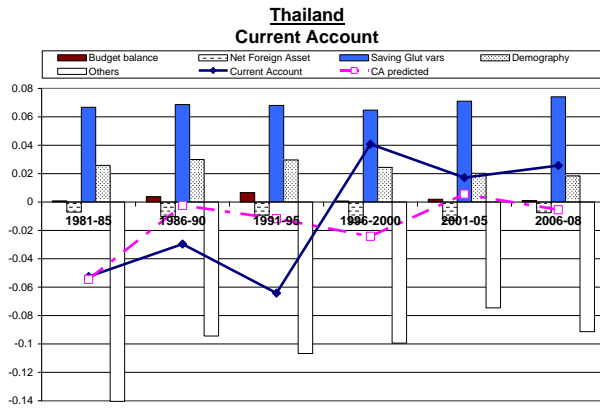
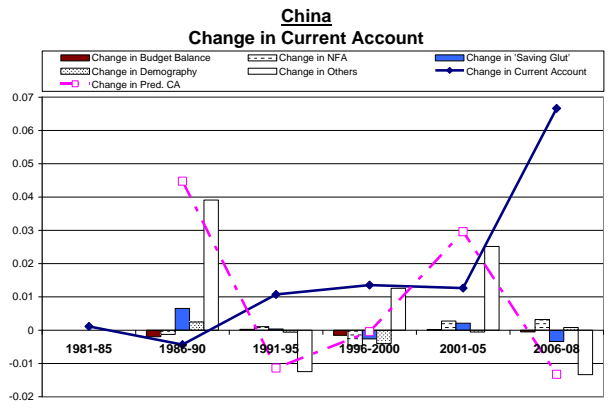
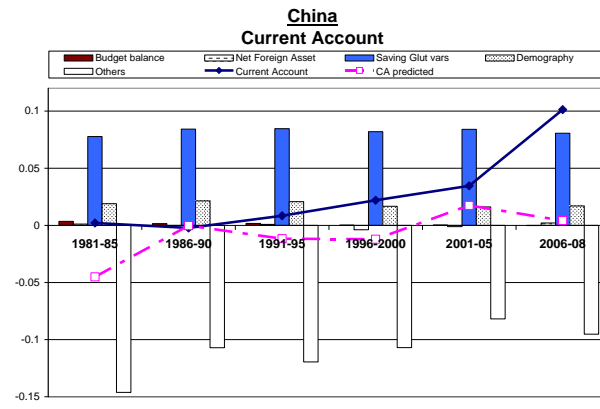
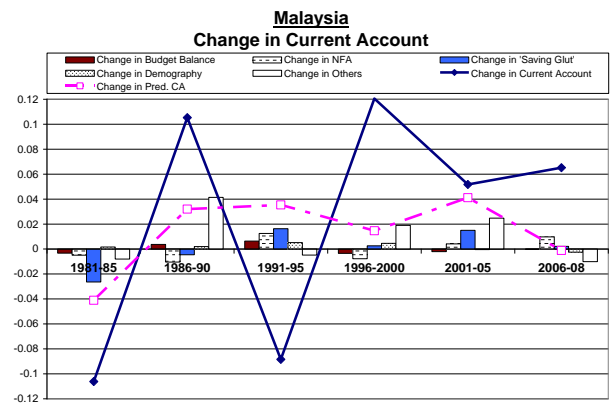
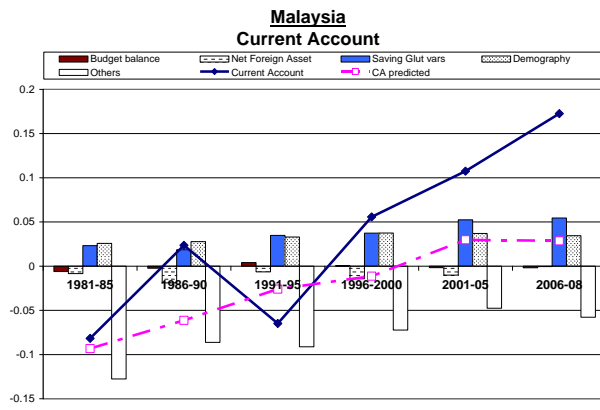
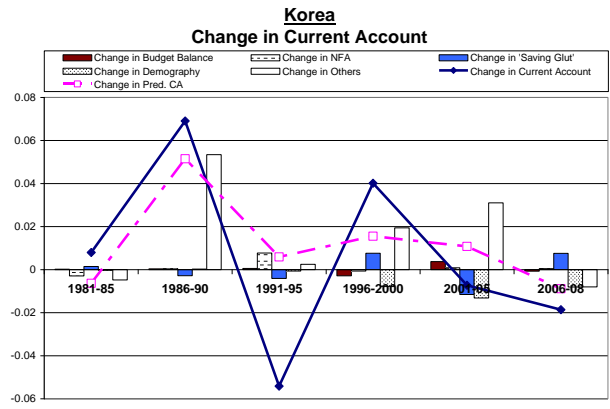
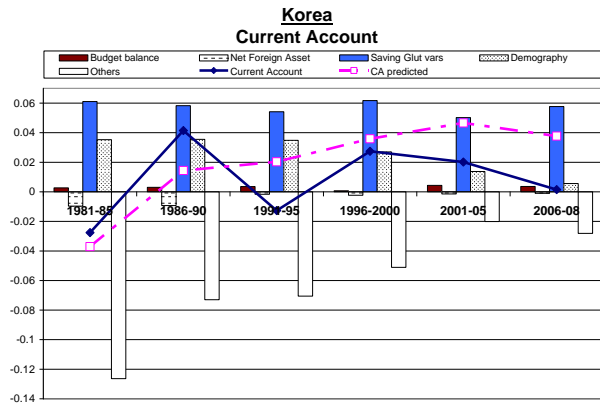
Source: IMF, *World Economic Outlook*, September 2011.

**A-Figure 3: Estimated Contributions to Current Accounts Balances**  
(Using the Estimates from Model 2)



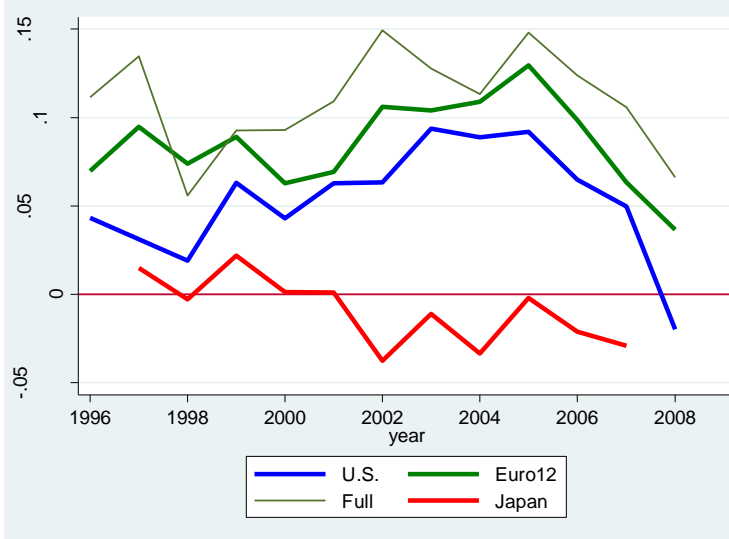


**A-Figure 3 (continued): Estimated Contributions to Current Accounts Balances**  
(using the Estimates from Model 2)

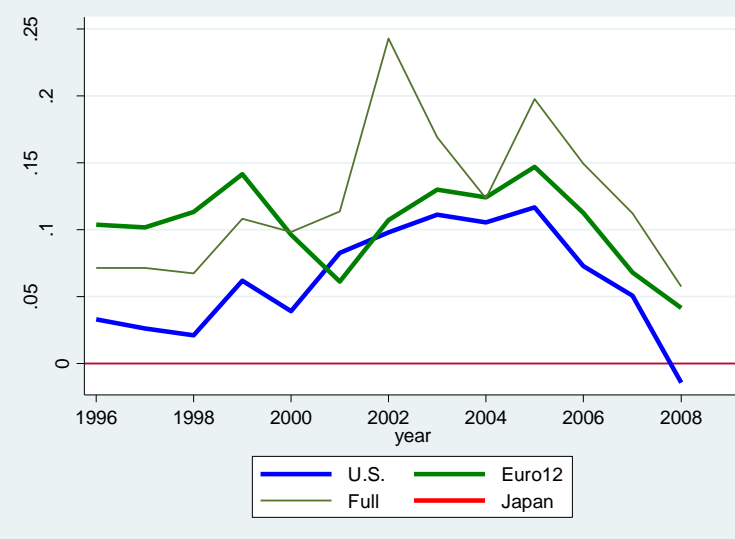


### A-Figure 4: Growth Rates of 'Leverage'

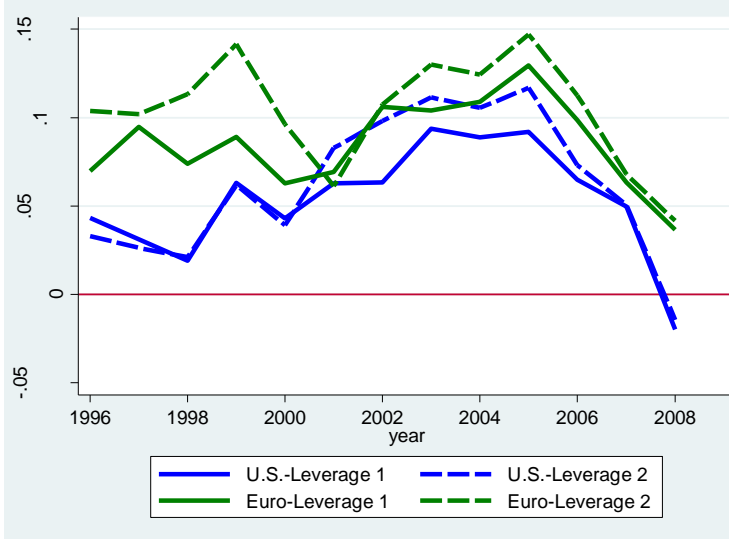
(a) Growth rates of HH Leverage 1



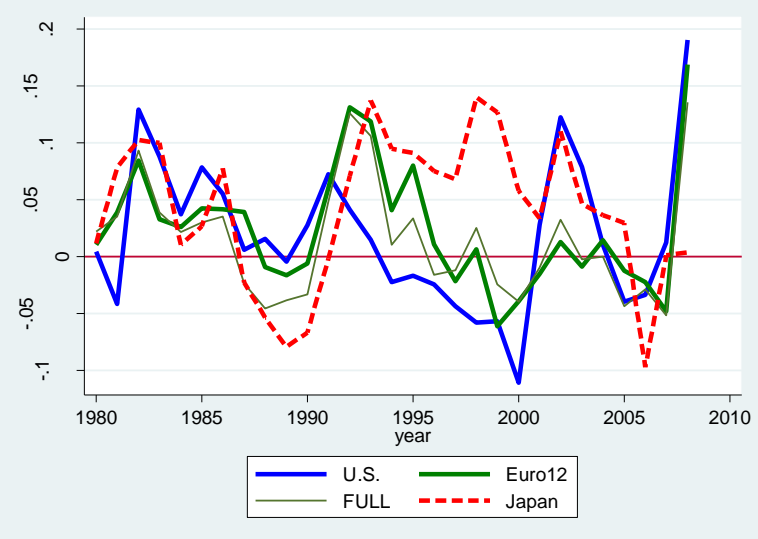
(b) Growth rates of HH Leverage 2



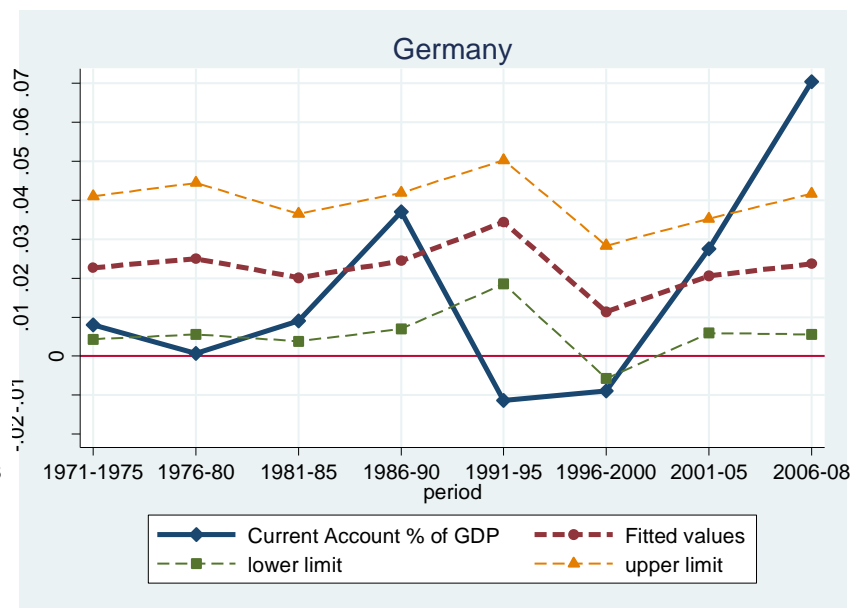
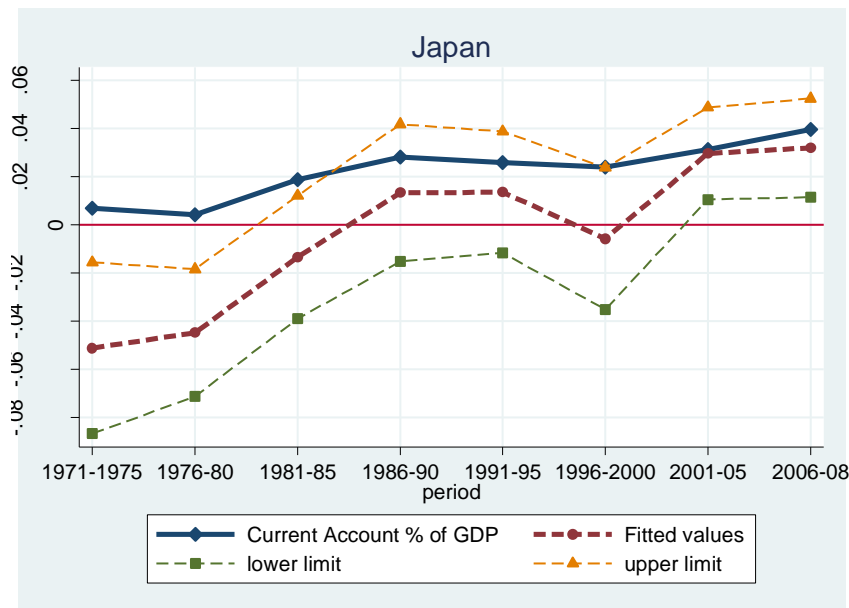
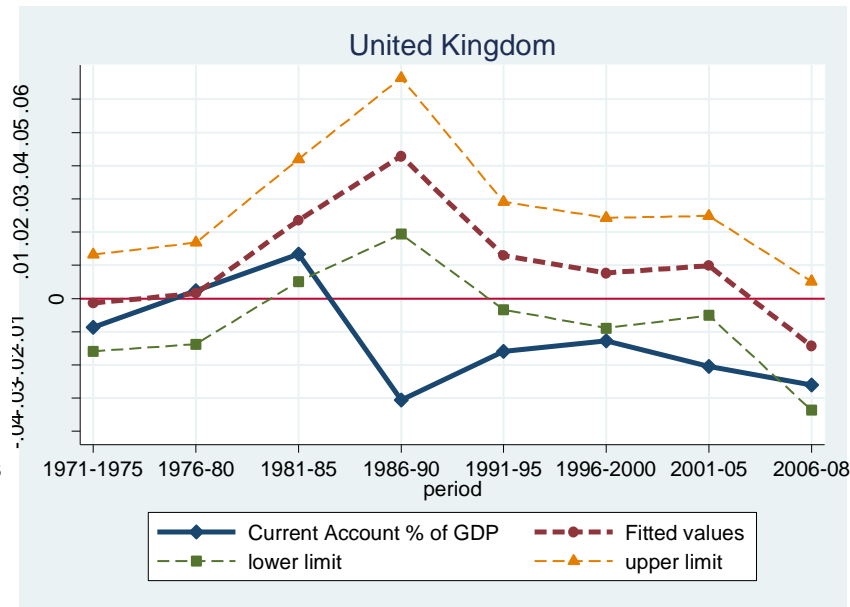
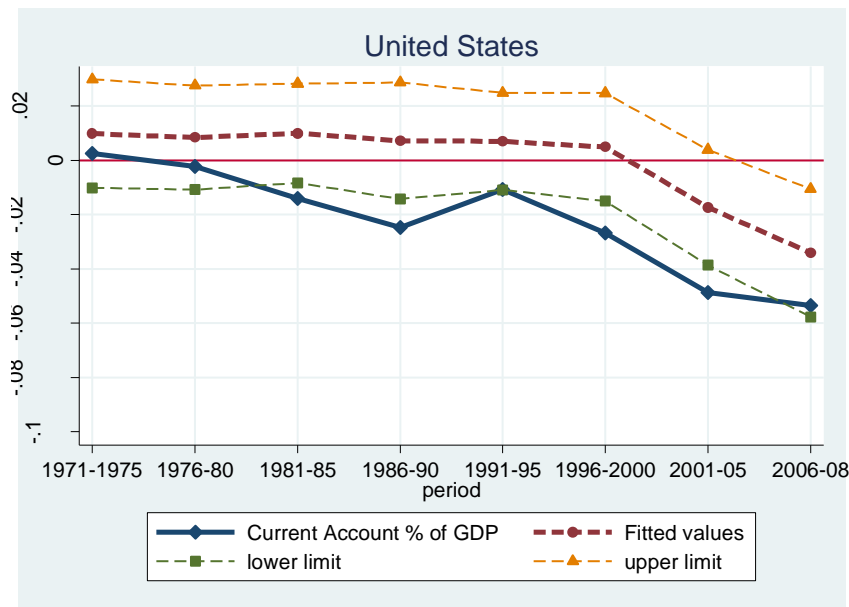
(c) Growth rates of HH Leverages 1 and 2



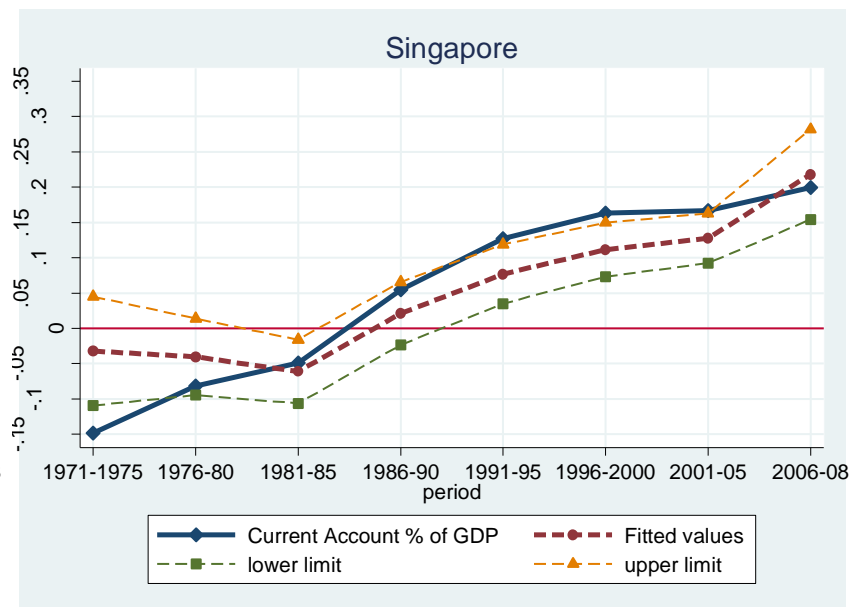
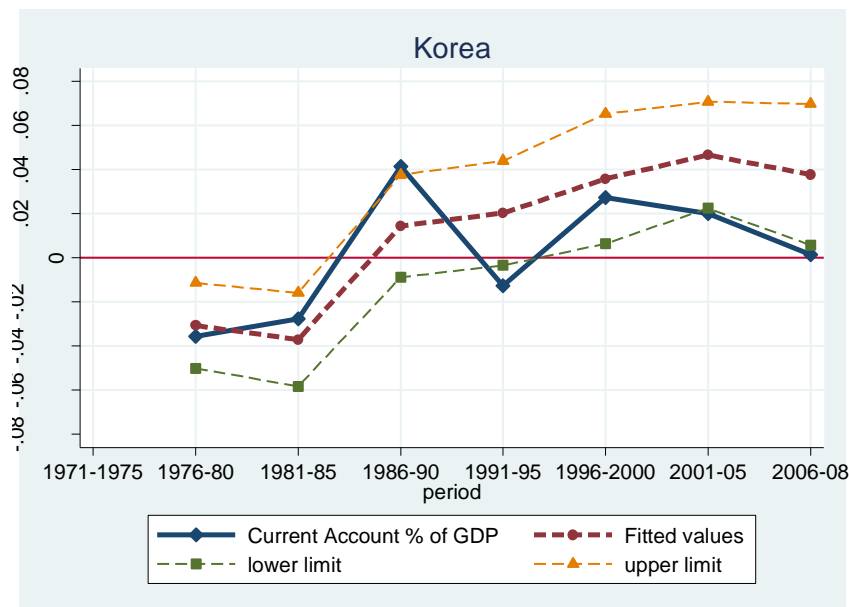
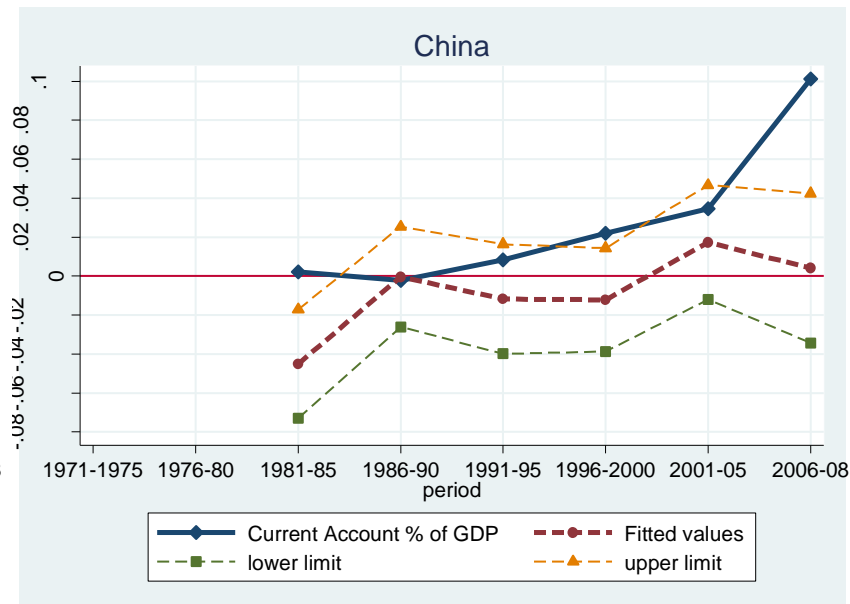
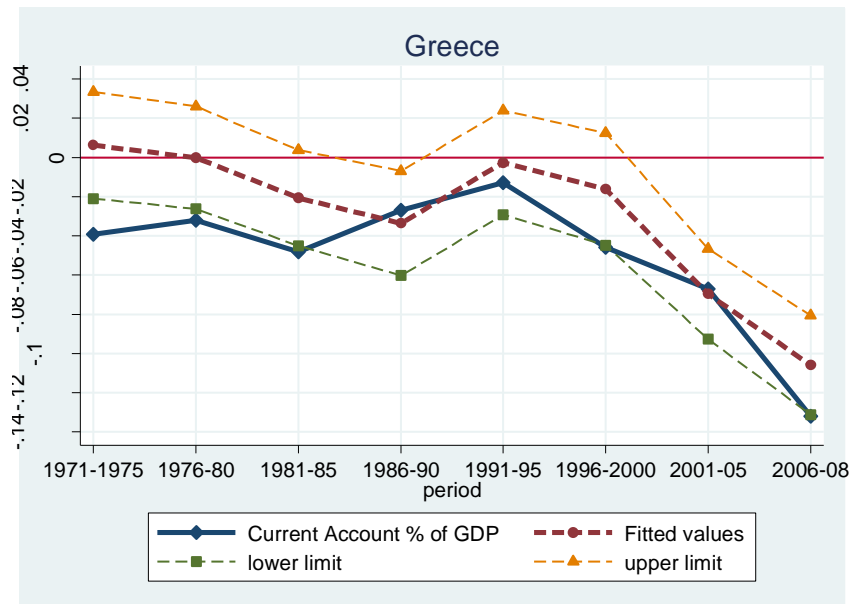
(d) Growth rates of Government Leverage



**A-Figure 5: In-sample Predictions of Current Accounts (using the Estimates from Model 2)**

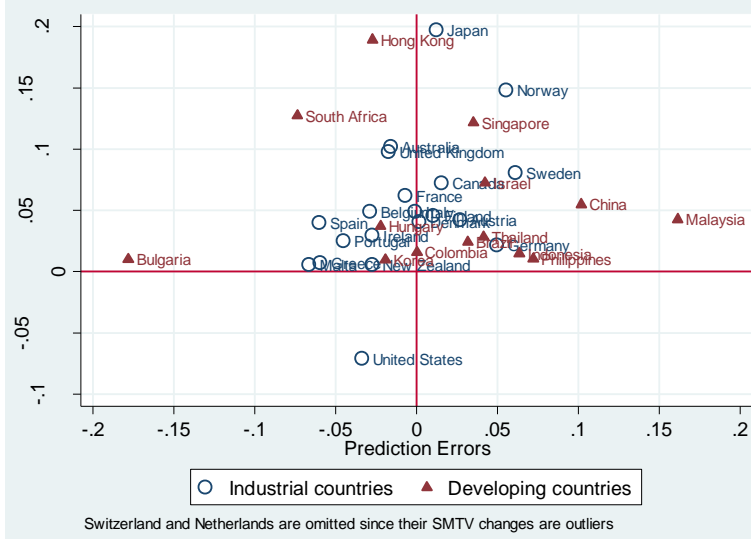


**A-Figure 5 (cont'd): In-sample Predictions of Current Accounts (using the Estimates from Model 2)**

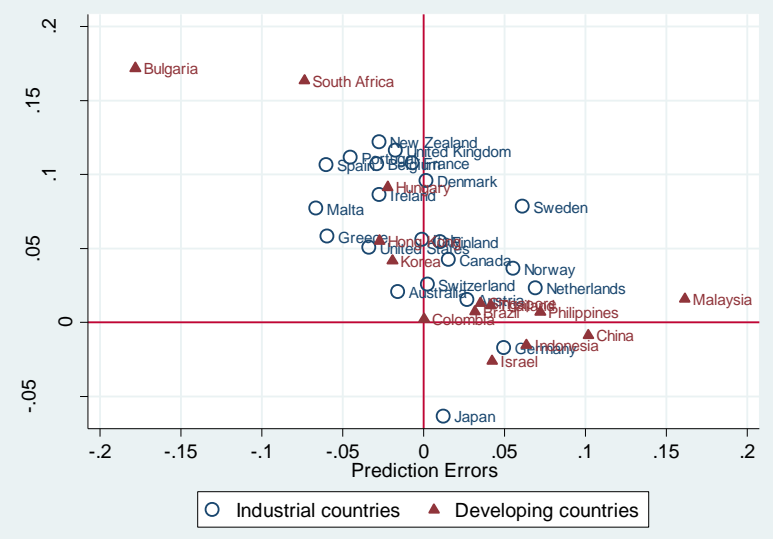


## A-Figure 6: Prediction Errors vs. Real Appreciation Rate of Housing Values

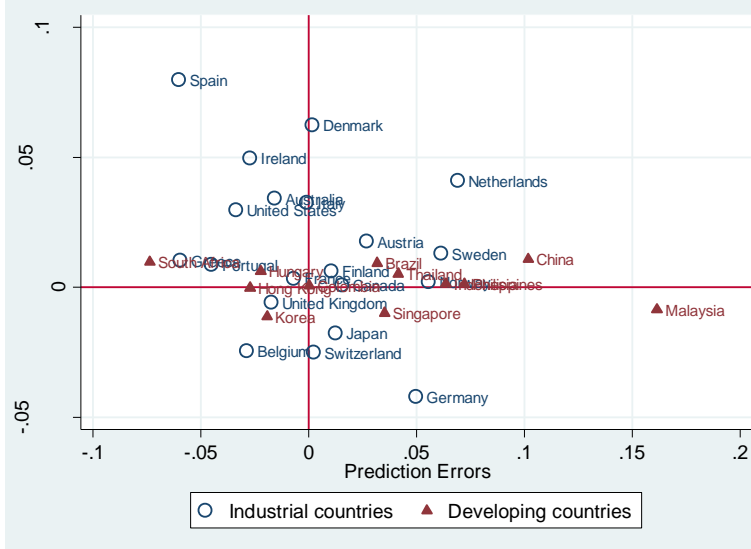
(a) Growth Rate of Stock Market Total Value, 2002-06



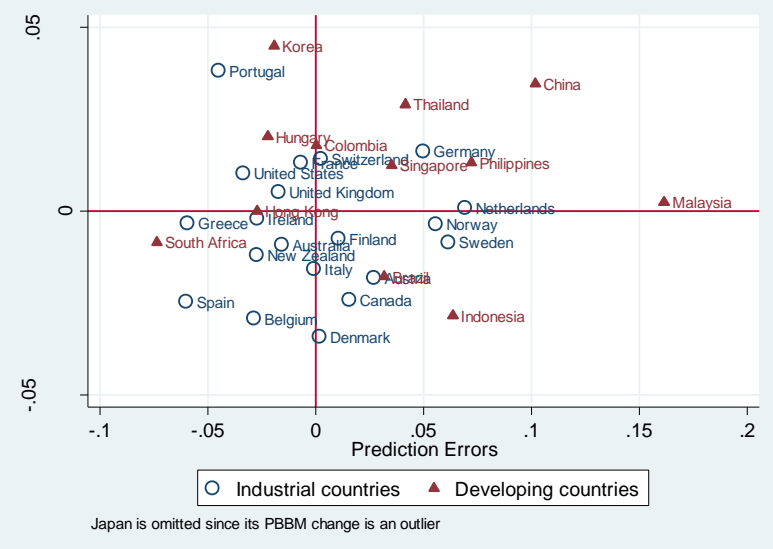
(b) Real Appreciation Rate of Housing Values, 2002-06



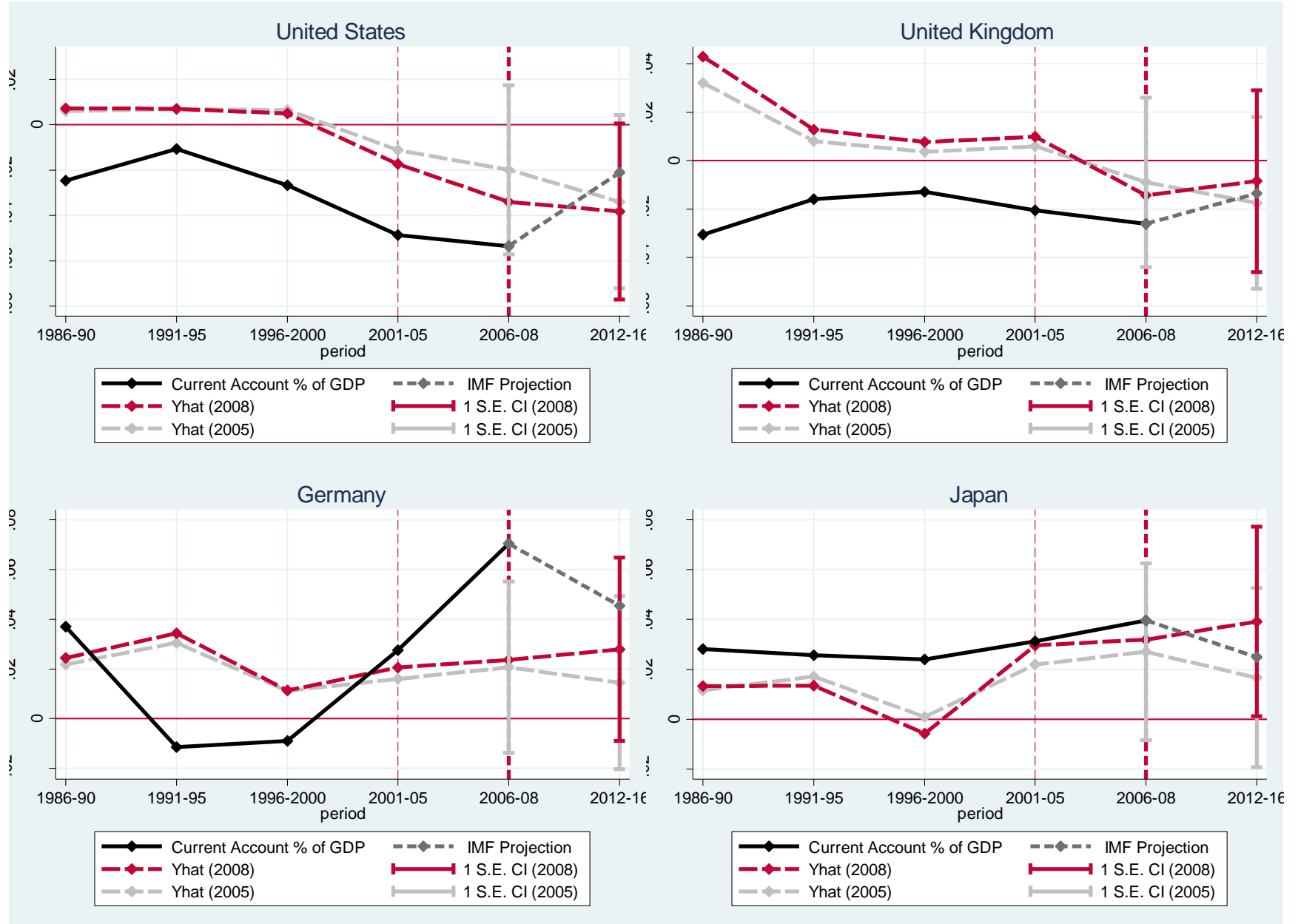
(c) Growth Rate of Private Bond Market Cap., 2002-06



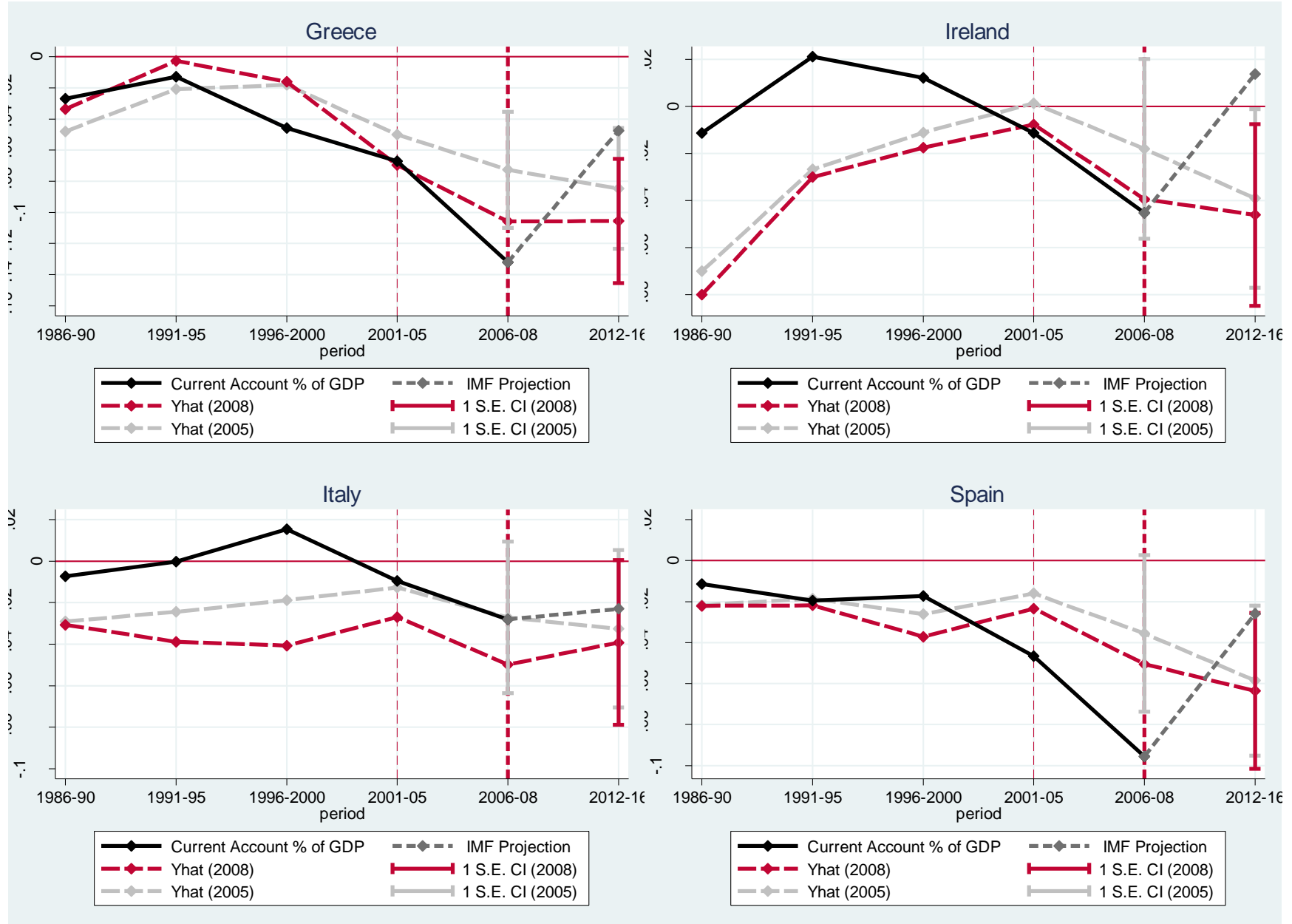
(d) Growth Rate of Public Bond Market Cap., 2002-06



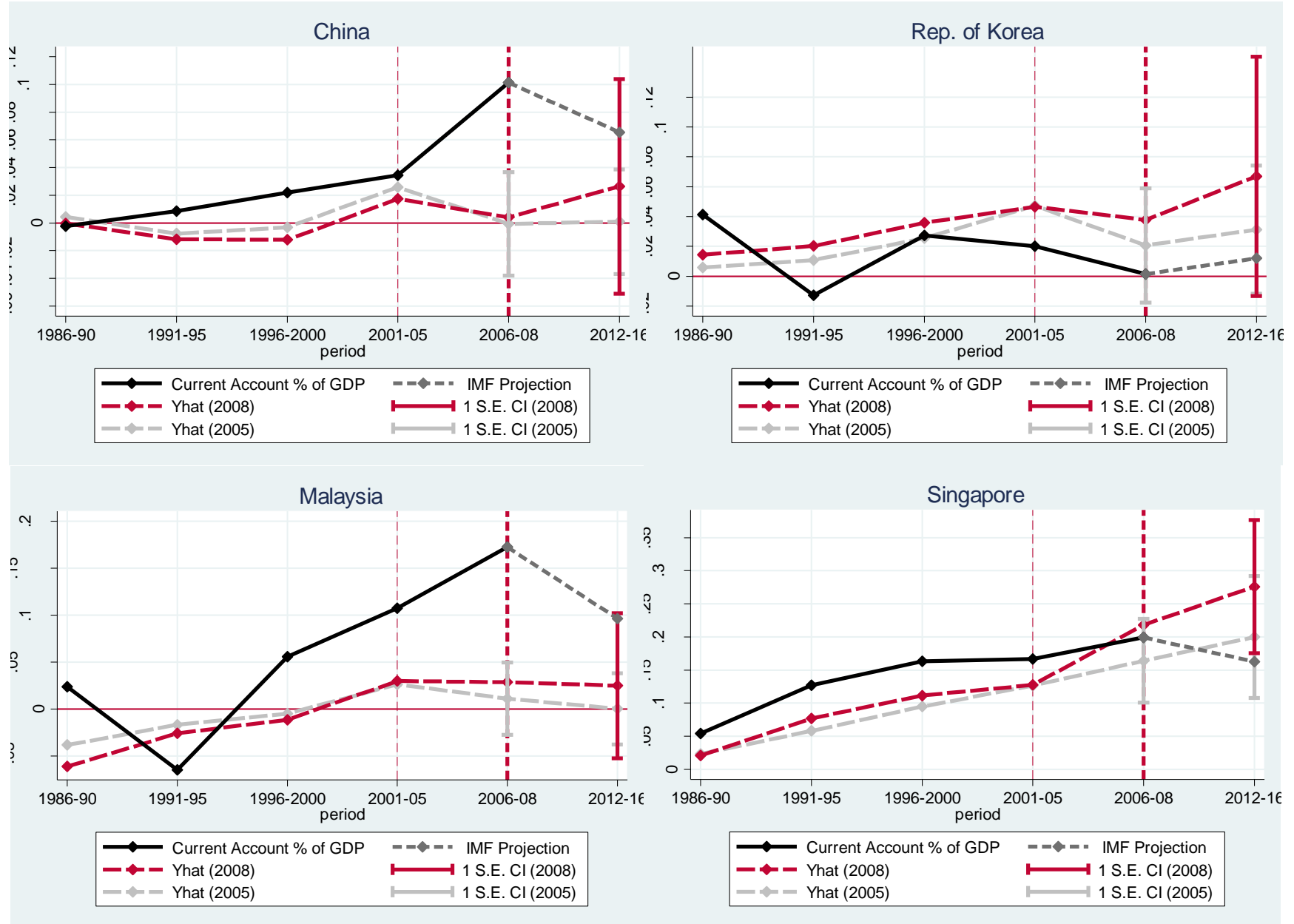
A-Figure 7: Forecasts of Current Account Balances for 2012-16 using data up to 2008 (red) or 2005 (grey)



**A-Figure 7 (continued): Forecasts of Current Account Balances for 2012-16 using data up to 2008 (red) or 2005 (grey)**

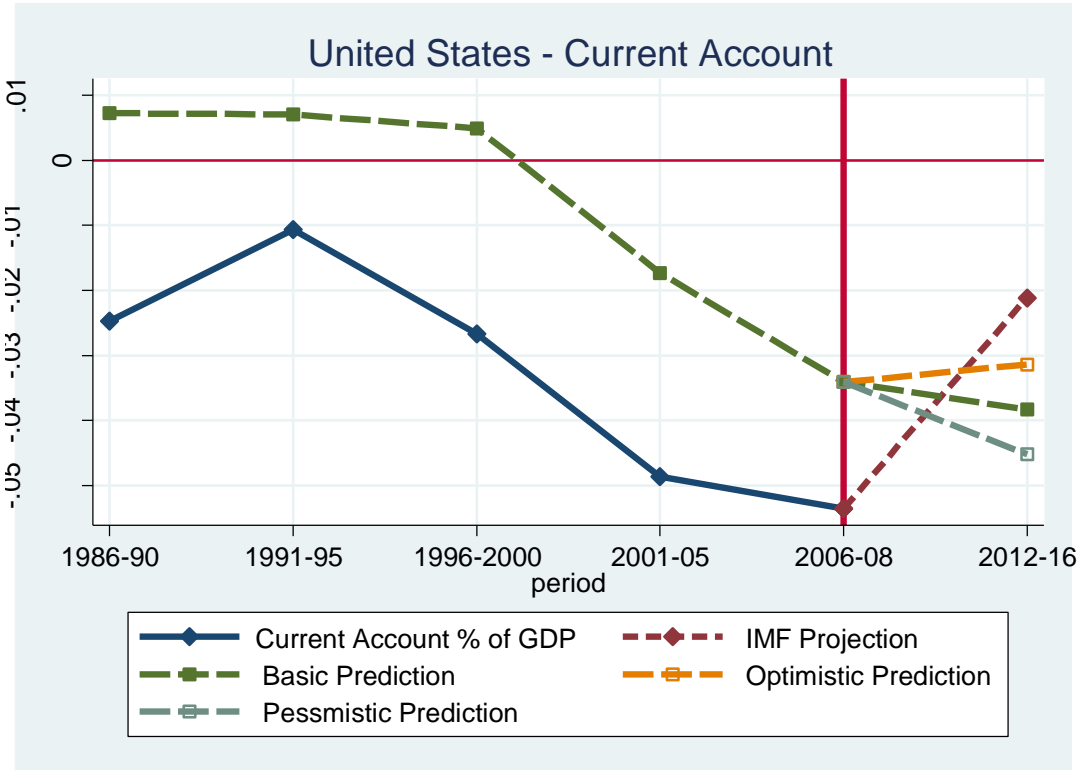


**A-Figure 7 (continued): Forecasts of Current Account Balances for 2012-16 using data up to 2008 (red) or 2005 (grey)**

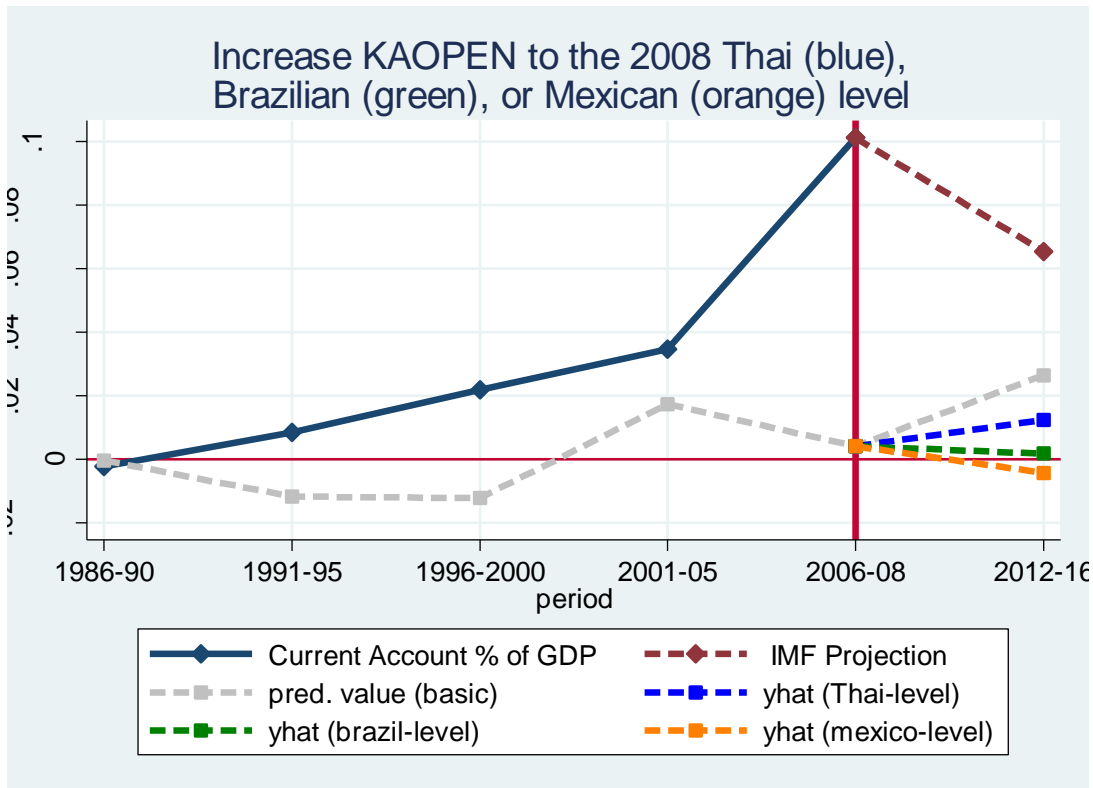




**A-Figure 8: U.S. Current Account Projections for Optimistic and Pessimistic Scenarios**



**A-Figure 9: What if China Liberalizes Its Financial Markets**



**A-Figure 10: What if China both Develops and Liberalizes Its Financial Markets**

