

# CENTRE FOR APPLIED MACROECONOMIC ANALYSIS

The Australian National University



---

**CAMA Working Paper Series**

**May, 2011**

---

GLOBAL FISCAL CONSOLIDATION

**Warwick J McKibbin**

Research School of Economics, ANU  
The Lowy Institute for International Policy  
The Brookings Institution

**Andrew B Stoeckel**

Centre for Applied Macroeconomic Analysis, ANU

---

CAMA Working Paper 9/2011

<http://cama.anu.edu.au>

# **Global Fiscal Consolidation<sup>1</sup>**

**Warwick J McKibbin**

Research School of Economics, Australian National University  
& The Lowy Institute for International Policy  
& The Brookings Institution

and

**Andrew B Stoeckel**

Centre for Applied Macroeconomic Analysis,  
Australian National University

Draft 1 May 2011

---

<sup>1</sup> Paper prepared for the 10th anniversary meeting of the Asian Economic Panel held at Columbia University in New York, March 23–24, 2011. The authors thank Alison Stegman for technical support and Yiyong Cai, Hyejin Park and Yingying Lu for excellent research assistance. The views expressed in the paper are those of the authors and should not be interpreted as reflecting the views of any of the above collaborators or of the institutions with which the authors are affiliated including the trustees, officers or other staff of the Australian National University, the Lowy Institute or the Brookings Institution.

## ABSTRACT

The build up in government debt in response to the 'great recession' has raised a number of policy dilemmas for individual countries as well as the world as a whole. Where the government fiscal stimulus was seen as necessary to restore confidence to markets and stimulate deteriorating economies in the aftermath of the 'great recession' by 2010 the massive fiscal stimulus programs and associated run-up in debt had, for many economies, become a confidence sapping exercise. This need for a change of fiscal policy stance has fuelled another debate that has two related aspects. One is the impact of fiscal consolidation on economies that are tightening and the flow-on effects to the world economy. The other debate is how much tightening there should be and how quickly.

This paper explores these issues in a global framework focussing on the national and global consequences of coordinated fiscal consolidation. It explores the implications this fiscal adjustment might have on country risk premia and what happens if all countries coordinate their fiscal adjustment except the United States. A coordinated fiscal consolidation in the industrial world that is not accompanied by US actions is likely to lead to a substantial worsening of trade imbalances globally as the release of capital in fiscally contracting economies flows into the US economy, appreciates the US dollar and worsens the current position of the US. The scale of this change is likely to be sufficient to substantially increase the probability of a trade war between the United States and other economies. In order to avoid this outcome, a coordinated fiscal adjustment is clearly in the interest of the global economy.

# 1. Introduction

The global financial crisis centred on the North Atlantic led to a deep global recession. Governments responded with monetary and fiscal policy that continues today. Many countries have official interest rates close to zero and governments are still stimulating their economies through discretionary fiscal spending well in excess of receipts. But the large discretionary fiscal stimulus packages combined with the economic slowdown and high levels of unemployment has seen a rapid deterioration in the fiscal position of many economies. The consequence for many has been a large run-up in government debt, as shown in figure 1. Debt itself is not a problem if the spending increases or tax cuts that underlie the increase in debt yield high rates of return that enable the debt to be serviced. The problem with large government debt, particularly during the crisis, is that it is not clear what investment has resulted that will yield the government a sufficient rate of return to service these debts.

The particular source of government debt expansion varies across countries. For some countries, a well-known example being Greece, the deterioration in fiscal position as a result of the global financial crisis came on the back of high levels of government debt that were already a cause for concern. Before the crisis, Greece had a level of debt to GDP of around 100 percent. Two years after the crisis, Greece's debt had ballooned to over 125 percent of GDP<sup>2</sup>. It is expected to deteriorate further. For Ireland, the level of debt to GDP was low at around 30 percent, but increased dramatically when the Irish Government bailed out several large banks.

Figure 1: **Government debt in OECD economies**

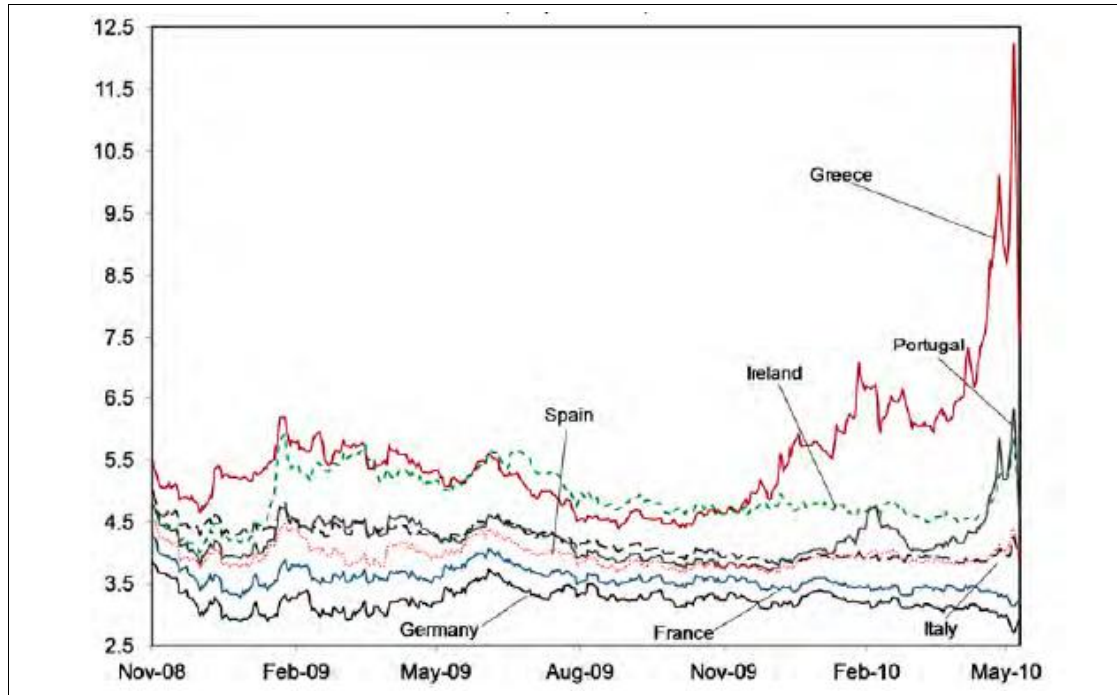


Source: OECD Economic Outlook 88 Database (November 2010).

<sup>2</sup> On a Maastricht criteria basis as computed by the OECD Economic Outlook and taking the start of the crisis to be 2008 when Lehman Bros collapsed.

The deterioration in the fiscal position in key economies has been so large that the financial markets have become unnerved. Risk premia on the government bonds in countries perceived to be risky have shot up. Continuing with the example of Greece, yields on 10 year group bonds have been some 900 basis points above the equivalent German bond rate (figure 2). Financial markets had judged that some economies were not likely to be able to service their debts and there was a probability they would default. That probability became reflected in the higher risk premia these countries had to pay on their borrowings.

Figure 2: **Ten year bond yields in selected Euro Area economies** Percent



Source: IMF (2010a), figure 8, p 25 (based on Datastream data).

Faced with higher interest bills on already high and growing levels of debt, many governments have had little choice but to announce austerity packages. Where the government fiscal stimulus was seen as both needed and necessary to restore confidence to markets and stimulate deteriorating economies in the aftermath of the global financial crisis, by 2010 the massive fiscal stimulus programs and associated run-up in debt had, for many economies, become a confidence sapping exercise. Fiscal austerity programs have been announced in many countries and, while acknowledging the delicate balance in promoting ‘growth friendly’ consolidation plans, the G-20 group of countries also noted the ‘risk that the failure to implement consolidation where necessary would undermine confidence and hamper growth’<sup>3</sup>.

This change of fiscal policy stance has fuelled another debate that has two related aspects. One is the impact of fiscal consolidation on economies that are tightening and the flow-on effects to the world economy. The other debate is how much tightening there should be and how soon, and what those effects might be. Many commentators argue that too much austerity now will simply drive the world economy back into

<sup>3</sup> Reuters, Toronto June 27 2010, Extracts from Communiqué.

recession and potentially bring on another financial crisis since the health of bank balance sheets and that of households is not fully restored. Yes, so the argument goes, fiscal austerity is needed at some stage — but, because households and businesses are busily paying down debt, now is not the time for premature tightening by governments.

This debate about the domestic and international effects of fiscal consolidation is not new. It was a topical debate in the United States over the 1990s given their quadrupling of public debt between 1980 and 1992. Deficit reduction became a priority for President Clinton's administration. Back then, the administration was facing projections by the Congressional Budget Office of deficits of up to 6 percent of GDP by the turn of the century.

At the same time, another major debate about fiscal consolidation was occurring in Europe<sup>4</sup>. Under the Maastricht Agreement the European Economic Community (as it was then called) proposed implementing a single currency in Europe by the end of the 1990s. But, to be a participant in this monetary union, countries had to satisfy four indicators of policy convergence. These macro indicators covered inflation, interest rates and the movement of each currency within a narrow band as well as a fourth — that the general government deficit should be no more than 3 percent of GDP and the ratio of government debt to GDP must be approaching the benchmark of 60 percent of GDP at a reasonable pace. This last criterion meant that some countries, notably Italy, Belgium, Greece and Portugal, needed to undertake a significant fiscal consolidation to satisfy the criteria for fiscal convergence by 1997 at a time when they were growing slowly<sup>5</sup>.

Some of the issues back then were how best to undertake this fiscal consolidation: by raising taxes or by cutting spending? And, if it was to be expenditure cuts, where should they occur?<sup>6</sup>

But another set of issues surrounded the effects of the fiscal consolidation on the domestic economy and the flow-on effects to the world economy. These flow-on effects can be important in a globalised world of integrated trade and financial linkages. For example, McKibbin and Bagnoli (1993) showed that two crucial aspects of fiscal consolidation are a reduction in real long term interest rates (which stimulates investment) and a depreciation of the local currency (which stimulates net exports). But, they point out, if foreign economies act to cut their own savings rates and, therefore, raise world interest rates, or act to depreciate their currencies so as to neutralise the depreciation of the local currency, then two of the important stimulative channels of the fiscal consolidation will be offset. Global policy coordination can, therefore, be crucial to gain maximum effect from fiscal consolidation.

---

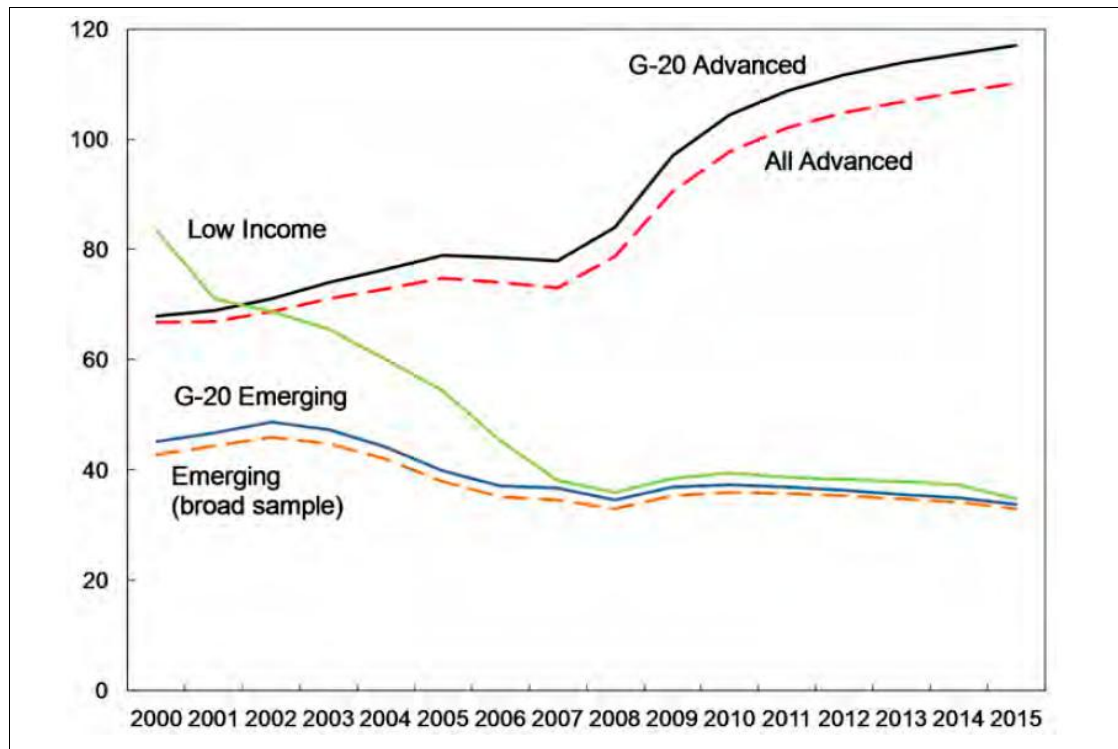
<sup>4</sup> See Giavazzi and Pagano (1990) and Allsop et al. (1999)

<sup>5</sup> McKibbin (1994) gives a summary of the fiscal consolidation requirements in the 1990s in the OECD during a period of low growth.

<sup>6</sup> The asymmetry between US and European fiscal positions during the 1980s is explored in McKibbin and Sachs (1991).

Fast forward to today's circumstances and that there is once again a need for fiscal consolidation. As noted in the International Monetary Fund's (IMF) May 2010 *Fiscal Monitor*, fiscal balances in the advanced economies are, on average, worsening despite the improvement in the global economy<sup>7</sup>. The IMF chief writes, '...it is now urgent to start putting in place measures to ensure that the increase in deficits and debts resulting from the crisis, mostly from the loss of output and revenues, does not lead to fiscal sustainability problems'<sup>8</sup>. The countries either consolidating or debating fiscal austerity are the most indebted, which includes many of the more advanced economies (many of which are in the OECD). There are a few OECD economies (discussed later) with fiscal deficits and public debt levels that are not a cause for concern. But the overriding generalisation is that developing countries are in far better shape with respect to public deficits than most advanced economies. This point is borne out by figure 3 below. Whereas gross debt ratios in G-20 advanced economies are expected to worsen to 2015, approaching 120 percent of GDP on average, those of emerging and low income economies are much lower and expected to be around a third that of advanced economies by 2015.

Figure 3: **General government gross debt ratios** Percent of GDP, 2009 PPP–GDP weighted average



Source: IMF (2010) based on staff estimates from the April 2010 WEO projections.

The fiscal consolidation called for by the IMF is partly an advanced/developing world debate because, in general, developing countries are in better shape than most major advanced economies. Because of different starting positions, the fiscal consolidation effort differs across the world. And so a question is posed: what is the effect of a global fiscal consolidation where the effort is in proportion to the initial imbalance (implying asymmetric adjustment)?

<sup>7</sup> IMF (2010), p7

<sup>8</sup> Dominique Strauss-Kahn (2010), p6. In IMF (2010)

The question is an interesting one because there are two related aspects. One is direct trade linkages since a substantial share of the developing world's exports ends up in advanced economies. The second aspect is that the fiscal deficits of many of the advanced economies (like the United States) are financed by capital outflows from developing countries (like China and South Asia). These capital flows stem from differences in savings and investment balances between economies, which are affected by real interest rates that are in turn affected by, among other things, the stance of fiscal policy.

As highly indebted economies reduce fiscal deficits and their borrowing requirements from the net savers in the world, what will be the effect on exports, where will the surplus savings now go and what will that do? These are the questions addressed in this paper. Note that while trade and financial effects are linked, it could be that the main financier of global public debt (namely China) to the major borrower (namely the United States) loses its appetite to continue lending on the same basis as before. An implicit assumption in the simulations in this paper is that this appetite remains the same<sup>9</sup>.

The framework we use to analyse the effects of fiscal consolidation empirically is the G-cubed multi-country model. This is a large scale multi-sectoral DSGE model, with rigidities and inertia calibrated to the observed economic dynamics. This global framework, and the country and sectoral composition, are described next. Following that, we outline exactly what has been simulated with the model. In particular, we describe the two fiscal consolidation paths chosen — one fast (over 10 years) and one slow (over 15 years) — for each economy in proportion to the departure from a 'workable' level of debt to GDP of 60 percent. But first, to understand the results when so many changes are made across the globe, two initial simulations where, first, the United States alone consolidates fiscally but no one else does and, second, where everyone else consolidates but the United States does not. This initial analysis makes the usual assumption that country risk premium are unaffected by the policy adjustment. To explore the critical question of the role of risk premia in changing the standard results for fiscal policy adjustment we include a fifth scenario where risk premia fall in response to the fiscal consolidation. This is reasonable since the urgency of fiscal consolidation is based on the sustainability of the run-up in debt and rising perceptions of risk in financial markets.

This paper is structured as follows. We outline the model underlying this study in section 2. In section 3 we explore the extent of fiscal consolidation required in each country or region required to reach 'more sustainable' levels. In section 4 we explore three different scenarios aimed at showing some key insights. The first scenario is a reduction in all countries such that government debt to GDP is stabilised at a maximum of 60 percent by 2020, focusing on a case where the deficits required to do this are undertaken over 10 years compared to a case where the same amount of deficit reduction is phased in over 15 years (clearly, the debt to GDP ratio is different, but the deficits reductions are comparable to get a measure of the role of timing). The second scenario is the case of the 10 year deficit reduction, but this time it is assumed

---

<sup>9</sup> In a separate paper (McKibbin and Stoeckel 2011) this assumption is relaxed and China changes its risk appetite for continued lending to the United States.



that country risk premia change in response to the credible announcement of fiscal cuts. The third scenario is the case where all countries with excessive debts cooperatively undertake fiscal contraction except the United States, who continues to run large fiscal deficits over the period of interest. A summary and conclusion is contained in section 5.

## 2. The model

The G-Cubed model is an intertemporal general equilibrium model of the world economy. The theoretical structure is outlined in McKibbin and Wilcoxon (1999)<sup>10</sup>. It builds on the model of McKibbin and Sachs (1991) and Jorgenson and Wilcoxon (1990). A number of studies — summarized in McKibbin and Vines (2000) — show that the G-cubed modelling approach has been useful in assessing a range of issues across a number of countries since the mid-1980s<sup>11</sup>. Some of the principal features of the model are as follows.

The model is based on explicit intertemporal optimization by the agents (consumers and firms) in each economy<sup>12</sup>. In contrast to static CGE models, time and dynamics are of fundamental importance in the G-Cubed model. The G-Cubed model is known as a DSGE (Dynamic Stochastic General Equilibrium) model in the macroeconomics literature and as a Dynamic Intertemporal General Equilibrium (DIGE) model in the computable general equilibrium literature. The main difference to small scale DSGE models now popular at central banks is the large amount of sectoral disaggregation and considerable degree of country disaggregation.

In order to track the macro time series, the behaviour of agents is modified to allow for short run deviations from optimal behaviour either due to myopia or to restrictions on the ability of households and firms to borrow at the risk free bond rate on government debt. For both households and firms, deviations from intertemporal optimizing behaviour take the form of rules-of-thumb, which are consistent with an optimizing agent that does not update predictions based on new information about future events. These rules-of-thumb are chosen to generate the same steady state behaviour as optimizing agents so that, in the long run, there is only a single intertemporal optimizing equilibrium of the model. In the short run, actual behaviour is assumed to be a weighted average of the optimizing and the rule-of-thumb assumptions. Thus, aggregate consumption is a weighted average of consumption based on wealth (current asset valuation and expected future after-tax labor income) and consumption based on current disposable income. Similarly, aggregate investment is a weighted average of investment based on Tobin's Q (a market valuation of the expected future change in the marginal product of capital relative to the cost) and investment based on a backward looking version of Q. In the model software, it is possible to change the information set of forward looking agents after a scenario begins to unfold.

There is an explicit treatment of the holding of financial assets, including money. Money is introduced into the model through a restriction that households require money to purchase goods.

The model also allows for short run nominal wage rigidity (by different degrees in different countries) and, therefore, allows for significant periods of unemployment depending on the labor market institutions in each country. This assumption, when

---

<sup>10</sup> Full details of the model including a list of equations and parameters can be found online at: [www.gcubed.com](http://www.gcubed.com).

<sup>11</sup> These issues include: Reaganomics in the 1980s; German unification in the early 1990s; fiscal consolidation in Europe in the mid-1990s; the formation of NAFTA; the Asian crisis; and the productivity boom in the US.

<sup>12</sup> See Blanchard and Fischer (1989), and Obstfeld and Rogoff (1996).

taken together with the explicit role for money, is what gives the model its ‘macroeconomic’ characteristics. (Here again the model’s assumptions differ from the standard market clearing assumption in most CGE models.) Equilibrium between aggregate demand and aggregate output is maintained by flexible prices, which causes demand to adjust as well as short term supply.

Global accounting identities are imposed on the model so, for example, for every borrower there is a lender — thereby avoiding the fallacy of composition. Likewise, the model gives a careful treatment of stock-flow relations such as the accumulation of current account deficits into foreign claims on domestic output, which has to be serviced by future trade surpluses. On the fiscal side, which is the focus of this study, the accumulation of fiscal deficits into government debt has to be serviced from future revenues — though it does not have to be completely paid off.

The model distinguishes between the stickiness of physical capital within sectors and within countries and the flexibility of financial capital, which immediately flows to where expected returns are highest. This important distinction leads to a critical difference between the quantity of physical capital that is available at any time to produce goods and services, and the valuation of that capital as a result of decisions about the allocation of financial capital.

As a result of this structure, the G-Cubed model contains rich dynamic behaviour, driven on the one hand by asset accumulation and, on the other, by wage adjustment to a neoclassical steady state. It embodies a wide range of assumptions about individual behaviour and empirical regularities in a general equilibrium framework. The interdependencies are solved out using a computer algorithm that solves for the rational expectations equilibrium of the global economy. It is important to stress that the term ‘general equilibrium’ is used to signify that as many interactions as possible are captured, not that all economies are in a full market clearing equilibrium at each point in time. Although it is assumed that market forces eventually drive the world economy to neoclassical steady state growth equilibrium, unemployment does emerge for long periods due to wage stickiness, to an extent that differs between countries due to differences in labor market institutions.

In the version of the model used here (version 95V) there are six sectors (energy, mining, agriculture, manufacturing durables, manufacturing non-durables and services) as well as a generic capital producing sector in each country. There are 17 countries/regions as set out in table 1.

**Table 1: Countries/regions**

United States	China
Japan	India
United Kingdom	Indonesia
Germany	Other Asia
Rest of Euro Zone	Latin America
Canada	Other developing countries
Australia	Eastern Europe & former S U
Korea	Oil-exporting & Middle East
ROECD	

### 3. The extent of fiscal consolidation

There is no specific number that can say that a country's debt is too high. Indeed, the debt is not the issue. Rather, the issue is the quality of expenditure or tax reductions that the debt has enabled. Nonetheless, a figure of 60 percent debt to GDP is generally taken to be a reasonable measure based on the following reasoning. A decade ago, gross debt/GDP ratios were a bit above 60 percent (see figure 4). This is the generally accepted number for 'reasonable stability'. It was, for example, one of the Maastricht criteria for EU members to enter the Euro. The important thing is to bring the primary fiscal balance (the total government deficit less interest payments on debt) into surplus to service the debt<sup>13</sup>. So, for advanced economies, average debt/GDP ratios have to fall from around 100 percent to 60 percent. For emerging economies, debt levels are on average less than 40 percent, with only India as one of the large standout economies with a ratio of 75 percent. The IMF takes 40 percent debt/GDP as a reasonable target for emerging economies.

The IMF (*Fiscal Monitor*, November 2010)<sup>14</sup> has calculated the reduction in the cyclically adjusted primary balance to bring gross debt/GDP down to 60 percent for advanced economies and 40 percent for emerging economies over ten years<sup>15</sup>. These are the starting consolidation numbers used here, except for the following. For those economies with debt/GDP ratios already less than 60 percent, the assumption the IMF makes is to stabilise debt at expected end-2012 levels, but this implies a significant contraction by Australia, which has the lowest debt/GDP ratios of the advanced economies. For others (for example, Korea), the implication is for negative consolidation — that is, stimulus. So the change in the fiscal positions of Australia and Korea has been assumed at zero. Of note too is the assumption by the IMF for Japan to consolidate to 80 percent debt/GDP, partly reflecting their special status where virtually all their borrowings are made from domestic residents.

The assumed 10 year consolidations are set out in table 2 (for consolidation over 15 years the annual consolidation is proportionally adjusted).

---

<sup>13</sup> For stable debt dynamics, the present value of the primary budget surplus (not necessarily a surplus in each and every period) must equal the initial stock of debt to be serviced. That is, a government with a large initial debt burden will have to run larger primary surpluses in future than one with smaller initial debt. These debt dynamic conditions are fully built into the G-Cubed model used here.

<sup>14</sup> <http://www.imf.org/external/pubs/ft/fm/2010/fm1002.pdf>

<sup>15</sup> A similar analysis is undertaken in the OECD *Economic Outlook*, November 2010 (chapter 4) although the extent of consolidation varies due to different assumptions about rates of economic growth

Table 2: **Assumed fiscal consolidation**

<b>Country/regional grouping</b>	<b>Gross debt/GDP ratio</b>	<b>Fiscal consolidation in primary balance 2010 to 2020</b>
	<b>%</b>	<b>% of GDP</b>
United States	92.7	11.6
Japan	225.8	13.0
United Kingdom	76.7	8.8
Germany	75.3	3.0
Rest of Euro Zone	95.0	9.0
Canada	81.7	5.5
Australia	21.9	0.0
Korea	32.1	0.0
ROECD	44.5	0.0
China	19.1	3.0
India	75.1	7.0
Indonesia	26.7	0.0
Other Asia	30.0	0.0
Latin America	51.5	0.4
Other developing countries	30.0	3.0
Eastern Europe & former Soviet Union	52.0	4.5
Oil-exporting & Middle East	12.9	3.5
Average advanced (PPP base)	97.3	8.9
Average emerging (PPP base)	37.4	3.0

Source: IMF (2010), *Fiscal Monitor*, November; and author calculations.

#### 4. Three scenarios of fiscal consolidation

##### a. Scenario 1: A cut in fiscal deficits, rapid versus gradual

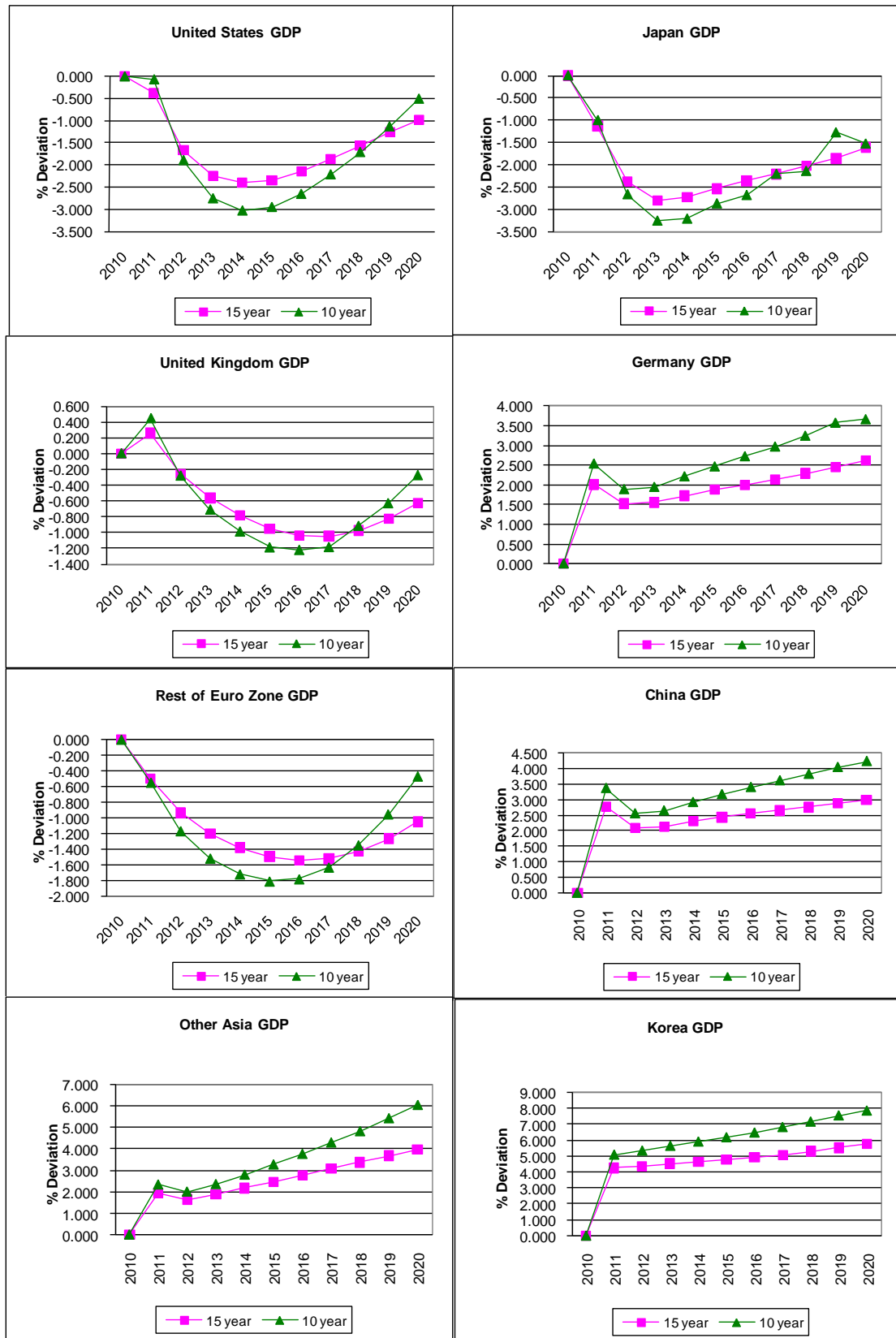
The first scenario focuses on the question: does it make much difference how fast countries cut their deficits? Because expectations play such an important role in the model, cutting deficits over 10 years is compared to cutting deficits over 15 years to reach the same end point described earlier, which was mostly 60 percent debt to GDP ratio for advanced economies.

The results are shown in figures 4 and 5. All results are expressed as percent deviation from a baseline of the model. In other words, the results are a comparison relative to a baseline (that is not shown). A zero therefore implies that the variable is unchanged from baseline. The baseline assumes that the primary debt to GDP in 2010 is continued forever with a lump sum tax gradually rising to cover all additional costs of servicing the resulting government debt. The baseline also makes a wide range of assumptions about future population growth by country and productivity growth by country and sector as well as wide range of other assumptions set out in detail in McKibbin, Pearce and Stegman (2009).

The first thing to note about the results is that when countries such as the United States, Japan and the Rest of Euro-zone make large cuts to government deficits, they have significant contractions in their economies relative to baseline. But for those economies where the required deficit reduction is smaller, such as Germany, China and other Asia, there is an expansion of real GDP above baseline (see figure 4). This contraction and expansion lasts for most of the next decade. Whereas the United States and Japan contract by around 3 percent of real GDP below baseline in 2014 under a 10 year fiscal consolidation, Germany and China expand by over 3 percent of real GDP above baseline by 2020.

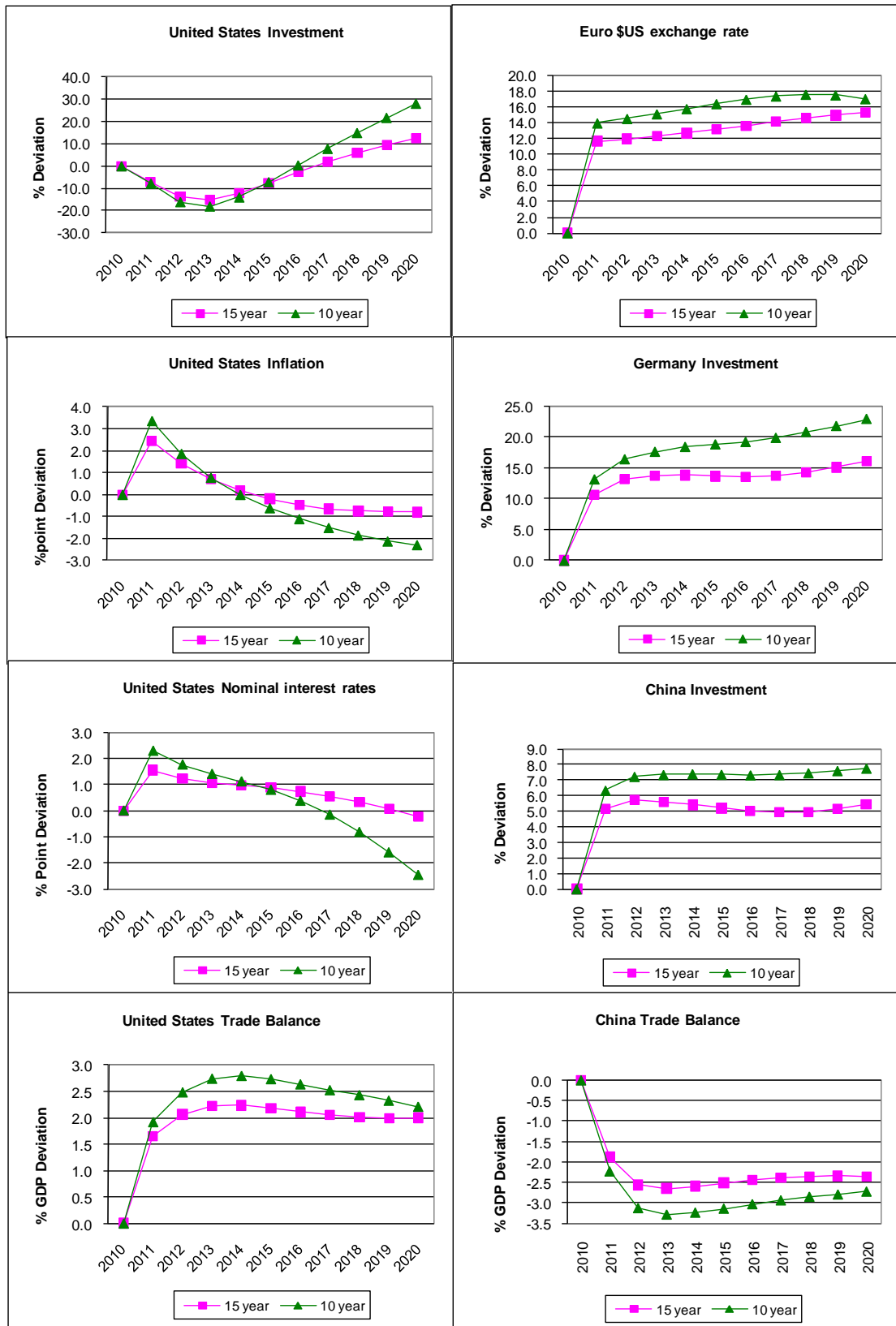
The reason for the contraction and expansion difference is what happens to savings, investment and capital flows. Some of the main effects are shown in figure 5. The large drop in government spending leads to a fall in GDP as government spending is removed from the economy. The current and expected decline in real GDP in the United States means it is less attractive to investors until after the economic contraction has been sustained, and eventually private investment is above baseline as private spending is eventually crowded-in. The government is borrowing less and, with consumption initially changing little, there is an excess of savings over investment. Hence, there must be a capital outflow (or much less inflow from base) and, for this to occur, the US dollar must depreciate — that is, the Euro (and many other currencies) must appreciate (shown in the right hand panel of figure 5 as the German/US dollar exchange rate). The extra capital inflows into countries like Germany and China causes investment in those economies to rise above baseline and is most significant for Germany (see middle and bottom right hand panels of figure 5). Meanwhile, the large depreciation of the US dollar causes a spike in inflation in 2011 (middle left panel of figure 5), which has to be addressed with monetary policy so nominal interest rates also spike in 2011 (bottom panel).

Figure 4: Real GDP changes from 10 and 15 year fiscal consolidations Deviations from baseline



Source: Simulations with G-Cubed (v95V) model.

Figure 5: Economic effects from 10 year and 15 year fiscal consolidations



Source: Simulations with G-Cubed (v95V) model.



Now compare the difference between the 10 year fiscal consolidation and 15 year consolidations shown in figures 4 and 5. Because expectations play such an important role in the model, and the presumption is that agents know and believe in the credibility of the programs, there is little material difference between cutting deficits over fifteen years as opposed to ten years. One key difference is that GDP is slightly higher in the first year in the case where the cuts are quicker. This is due to a more rapid decline in the financing requirements of the government being brought forward through asset markets. This first year positive effect on GDP is quickly reversed over time and the fall in GDP is larger as the cuts are deeper. The switching effect of gradual credible future fiscal consolidation is a familiar result from this model<sup>16</sup> The slower fiscal consolidation has lower real costs of adjustment over time as the fall in real GDP mid-way through the adjustment is less. Looking at figure 4, which shows just some of the results, the fall in real GDP in the United States in, say, 2014 is 3 percent below baseline under the 10 year consolidation, but the decline is nearly 2.5 percent that same year when the cuts are spread out over a longer period. For other countries, commonly the difference between the two scenarios is more likely to be in the order of 0.5 percent of GDP.

Because there is little difference in countries making the most consolidation, there is little flow-on difference to those countries making less or no fiscal policy adjustment. As before, Germany, China and other Asia stood (among others) to gain as the United States, Japan and others consolidated their fiscal positions. But, under the 15 year consolidation path, the smaller outflow of capital from countries with large fiscal adjustments means less inflow to those countries with small or no adjustments and so they gain less.

The message is that the small material difference between fast or slow fiscal consolidation means those having to make major consolidations to their fiscal positions will probably choose the slower adjustment path since the initial to mid-way costs are lower. An important proviso here is that the consolidations are seen to be credible as that alters expectations. There is also the issue of perceptions by the market about the risk premiums to put on loans to governments with high debt. This point is taken up next.

**b. Scenario 2: The cut in fiscal deficits is associated with a reduction in risk premia**

The primary reason governments need to cut fiscal deficits and reduce debt is that financial markets start to doubt the sustainability of government fiscal policy. Financial markets start to price in a risk factor to allow for the possibility of default on government debt. Hence, it can be reasonably assumed that successful fiscal consolidation would see risk premia fall.

On this basis, here we conduct a simulation where risk premia fall in response to cutting debt levels. Except for the United States, which is a special case as noted above, the cut in risk premia will be in proportion to the level of debt reduction as a share of GDP. The amount of risk reduction for reducing debt could be expected to be a non-linear relationship; for high levels of debt the risk of default could be expected

---

<sup>16</sup> See McKibbin and Sachs (1991); McKibbin and Bagnoli (1993).

to be proportionally much higher than for lower levels of debt. Some research<sup>17</sup> shows the marginal extra risk premium for countries with net debt to GDP ratios in the 60 to 70 percent bracket is an extra 8 basis points, but the marginal extra risk premium for ratios in the 90 to 100 percent debt to GDP bracket is over 13 basis points. Using this relationship gives the reduction in risk premia as set out in table 3.

**Table 3: Assumed reduction in risk premia with fiscal consolidation**

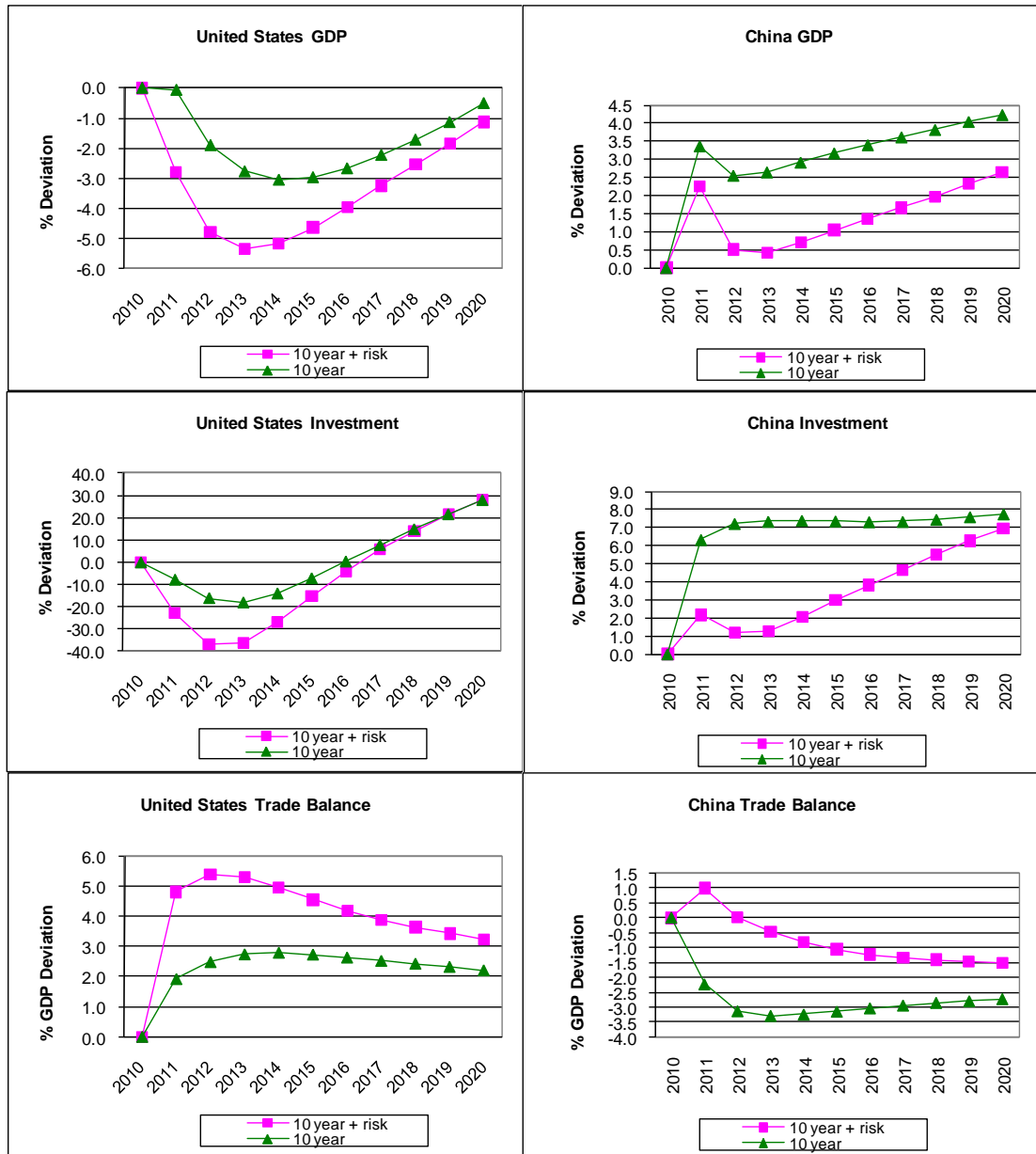
<i>Country/regional grouping</i>	<i>Reduction in risk premia</i>
	Basis points
United States	0
Japan	50
United Kingdom	118
Germany	87
Rest of Euro Zone	350
Canada	100
Australia	0
Korea	0
ROECD	0
China	0
India	150
Indonesia	0
Other Asia	0
Latin America	50
Other developing countries	100
Eastern Europe & former S U	100
Oil-exporting & Middle East	0

When countries consolidate their fiscal accounts, bring debt down to a more manageable 60 percent of GDP and enjoy a reduction in risk, they do better. Those where the reduction in risk is greatest now do relatively better. The cost of capital for these economies is relatively lower and they can borrow on more favourable terms. Investment flows to these economies, but the money has to come from somewhere. Now, other countries not enjoying the reduction in risk premia, such as the United States, do less well.

Whereas under a 10 year global fiscal consolidation by all countries needing to consolidate led to a reduction in US real GDP around 3 percent below baseline from 2013 to 2015, when there is an accompanying reduction in risk as set out in table 3 above, the fall in US real GDP is now around 5 percent below baseline (figure 6). And, in the rest of Euro-zone where debt problems are most severe, their real GDP could be 8 percent above baseline in 2011 and taper to around 5 percent above base by 2020. The rest of Euro-zone benefits from extra investment, which could initially be 30 per above what it would otherwise be (figure 6). This extra investment has come at the expense of less investment in the United States (among others not enjoying the same reduction in risk premia ).

<sup>17</sup>[http://www.westpac.co.nz/olcontent/olcontent.nsf/content/FM\\_Occasional\\_Paper\\_20020902/\\$FILE/The%20GIRM%20Occasional%20Paper.pdf](http://www.westpac.co.nz/olcontent/olcontent.nsf/content/FM_Occasional_Paper_20020902/$FILE/The%20GIRM%20Occasional%20Paper.pdf)

Figure 6: Ten year fiscal consolidation with reduction in risk



Source: Simulations with G-Cubed (v95V) model.

### c. Scenario 3: The world consolidates, but the US does not

The purpose of this simulation is to show what happens when the world's highly indebted countries are 'forced' to consolidate their fiscal accounts, but the US stands apart. This is a realistic possibility because of the already mentioned special position the United States enjoys in world financial markets. It is the reserve currency, it can borrow abroad in its own currency, it is the world's richest, most open capital market and it collects seigniorage from the enormous volume of its currency circulating in the world. The US can 'get away with' running fiscal deficits for longer than other countries. By contrast, sentiment can easily turn against smaller countries dependent on borrowing abroad to balance their books and so can have a fiscal consolidation 'forced' on them.

When the world acts to consolidate, but the US does not, the United States does well. Recall from simulation 1, where the United States undertook a large fiscal consolidation, that there was a strong capital outflow for the US and other countries undertaking large consolidations. Those countries did poorly compared to the recipients of the capital outflow. Now the rest of world borrows less and that leaves more capital for the United States to keep on borrowing more and invest. Figure 7 shows that US investment could be 20 percent above baseline in 2013 and 2014 before tapering off back to baseline.

Because there is now no outflow of capital from the United States when they do not consolidate, that means there is no need for currency depreciation. Indeed, the opposite is true. Before, when the US was a large consolidator, the Euro appreciated (a US depreciation), but now it is the Euro that depreciates. The depreciation is around 20 percent below baseline (see German/US dollar exchange rate in top right hand panel of figure 7).

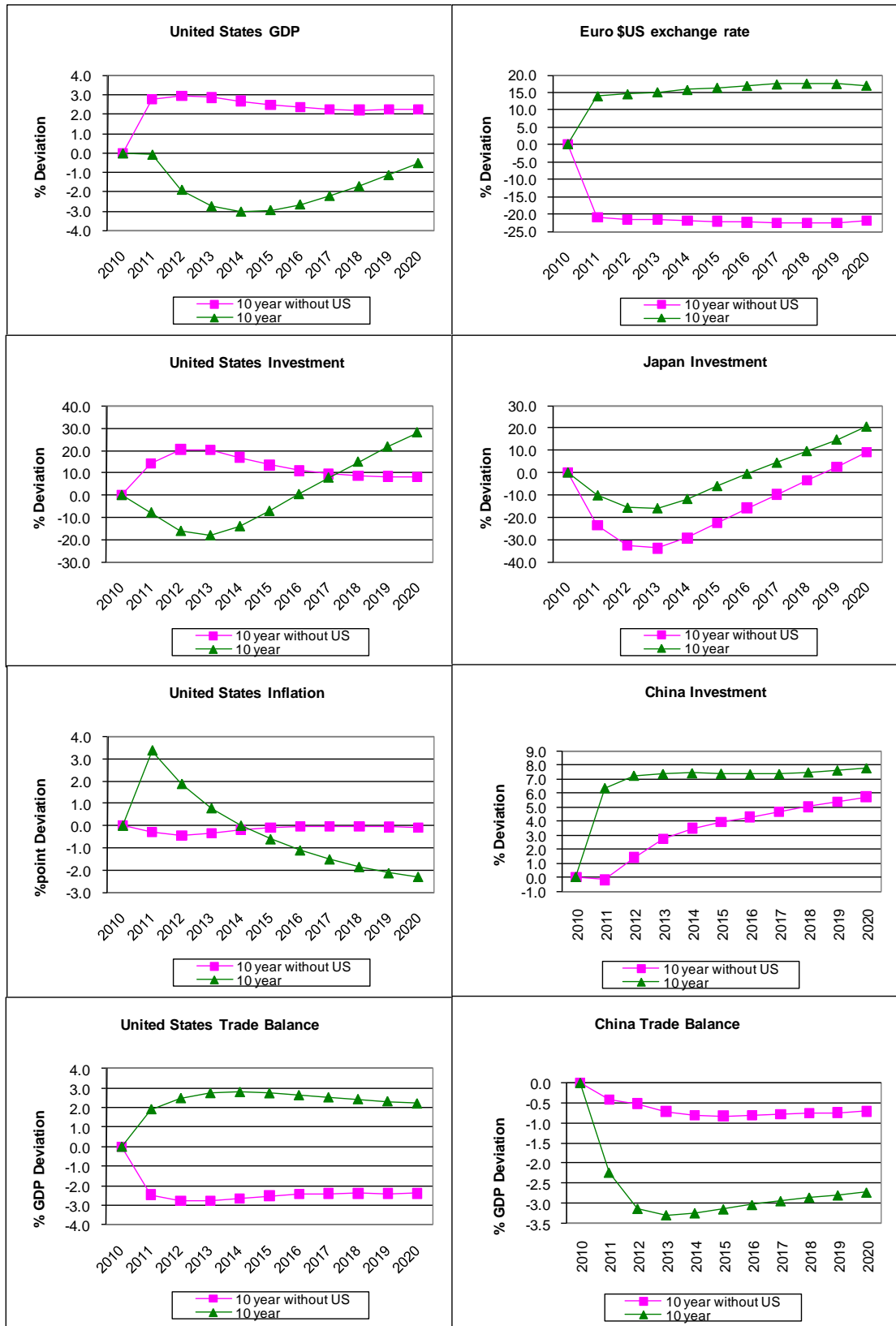
Extra investment by the United States means there is extra production and real GDP could be 2 to 3 percent above baseline for the decade (middle left hand panel figure 7). But, if the US does not share the extra burden, someone else does. One country hit hard by the possible non-participation of the United States in a global fiscal consolidation is Japan. The drop in Japanese investment could be over 30 percent below baseline in 2013 and 2014 (middle right panel of figure 7). China still gains extra investment since it does not have to consolidate its fiscal position, but the gain is now far less as shown on the bottom right panel.

Finally, because there is no large depreciation of the US currency (indeed, the opposite happens) there is no longer a spike in inflation (third bottom left panel of figure 7) and therefore no need for monetary policy to tighten. Also, US trade imbalances rise even further<sup>18</sup>. When the US was cutting fiscal deficits, the US current account deficit was improving substantially. When the US takes no action, but much of the rest of the world undertakes fiscal consolidation, US current account deficits rise and Japanese and European current surpluses rise. This substantial worsening in global trade imbalances would likely lead to significant pressures on US Congress to act to raise tariffs against cheap imports and could be very destructive.

---

<sup>1818</sup> See Lee, McKibbin and Park (2006) for an anatomy of global imbalances using an earlier vintage of the model used in this paper.

Figure 7: The world consolidates but the US does not Deviations from baseline



Source: Simulations with G-Cubed (v95V) model.

## 5. Summary and conclusion

Fiscal consolidation by high-income economies (in proportion to the size of their debt problem) has the temporary effect of lowering economic activity in those economies, but has a positive effect on developing countries and a few high-income economies not undertaking fiscal consolidation.

The reason is that the negative flow-on effects from trade linkages by high income economies reducing imports and stimulating exports with the developing world are offset by favourable financial flow-on effects, which provides capital for developing countries to increase GDP.

As prospects temporarily weaken in high-income economies as spending contracts with fiscal consolidation and governments borrow less, real long bond rates eventually fall although short real interest rates temporarily rise as future spending is brought into the present and central banks tighten monetary policy in response to higher inflation. Lower real long bond rates boost investment prospects in the developing world and this positive effect outweighs the negative direct trade effects. Consequently, there is a capital outflow from high-income economies to the developing world.

Developing countries receiving a capital inflow experience a decline in their trade balance, with the effect that global trade imbalances become smaller.

It makes little difference for developing countries whether the fiscal consolidation by high-income economies is fast (over 10 years) or slow (15 years). What matters for investment in developing countries is the long term real rate of interest and this is affected by expectations over future debt/GDP ratios. Implicit in this conclusion is that the credibility of both the slow and fast consolidations is the same. There are competing forces here: a slow consolidation involves lower annual adjustment costs (more credible), but runs the greater risk of being derailed by a public tiring of austerity (less credible).

The important story from fiscal consolidation as modelled in this paper is the large scale and asymmetry in the required adjustment and the large impacts this has, not only within adjusting economies, but between the economies that are adjusting (mostly industrialized economies) and developing economies. The linkages through trade balance and exchange rate adjustment are large. The management of this will be a key problem for policymakers over the coming decade.

A coordinated fiscal consolidation in the industrial world that is not accompanied by US actions leads to a substantial worsening of trade imbalances globally as the release of capital in fiscally contracting economies flows into the US economy, appreciates the US dollar and worsens the current position of the US. The scale of this change is likely to be sufficient to substantially increase the probability of a trade war between the United States and other economies. In order to avoid this outcome, a coordinated fiscal adjustment appears to be in the interest of the global economy.

## References

- Alesina, A.F. and Perotti, R. 1995. Fiscal Expansions and Fiscal Adjustments in OECD Countries. *Economic Policy* 10(21).
- Allsop, C., McKibbin, Warwick J. and Vines, D. 1999. Fiscal Consolidation in Europe: Some Empirical Issues. In Hughes-Hallett, A., Hutchison, M. and Hougaard Jensen S. 1999. *Fiscal Aspects of European Monetary Integration Cambridge*, pp. 288–319. University Press.
- Ardagna, S., Caselli, F. and Lane, T. 2004. Fiscal Discipline and the Cost of Public Debt Service: Some Estimates for OECD Countries. *The B.E. Journal of Macroeconomics* 7.
- Baldacci, E. and Kumar, M.S. 2010. Fiscal Deficits, Public Debt, and Sovereign Bond Yields. IMF Working Paper no. 10/184, IMF.
- Blanchard O. and Fischer, S. 1989. *Lectures on Macroeconomics*, MIT Press, Cambridge MA.
- Checherita, C. and Rother, P. 2010. The Impact of High and Growing Government Debt on Economic Growth: An Empirical Investigation for the Euro Area. ECB Working Paper no. 1237. ECB. Frankfurt.
- Christiano, L., Eichenbaum, M. and Rebelo, Sergio. 2009. When Is the Government Spending Multiplier Large? National Bureau of Economic Research Working Paper 15394.
- Cogan, J., Cwik, J. Taylor, J.B. and Wieland, V. 2010. New Keynesian versus Old Keynesian Government Spending Multipliers. *Journal of Economic Dynamics and Control* 34(3):281–95.
- Giavazzi, F. and Pagano, M. 1990. Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries. In *NBER Macroeconomics Annual 1990*, edited by Blanchard, O.J. and Fischer, S., Volume 5, MIT Press.
- Hall, R.E. 2009. By How Much Does GDP Rise If the Government Buys More Output? *Brookings Papers on Economic Activity*, pp. 183–231.
- Haugh, D., Ollivaud, P. and Turner, D. 2009. What Drives Sovereign Risk Premiums? An Analysis of Recent Evidence from the Euro Area. OECD Economics Department Working Paper no. 718.
- International Monetary Fund (IMF) 2010a. World Economic and Financial Surveys IMF Fiscal Monitor: Navigating the Fiscal Challenges Ahead, International Monetary Fund, Washington DC.
- 2010b. Will it Hurt? Macroeconomic Effects of Fiscal Consolidation, *IMF World Economic Outlook*, chapter 3.

- Jorgenson, Dale W. and Wilcoxon, Peter J. 1990, Environmental Regulation and U.S. Economic Growth, *The Rand Journal* 21(2):314–40.
- Lee, J.W., McKibbin, Warwick J. and Park, Y. 2006. Transpacific Trade Imbalances: Causes and Cures. *World Economy* 29(3):281–304.
- McKibbin, Warwick J. and Bagnoli, P. 1993. Fiscal Deficit Reduction: An Evaluation of Alternatives, Brookings Discussion Paper in International Economics #101.
- and Cagliarini, A. 2009. Relative Price Shocks and Macroeconomic Adjustment. In *Inflation in a Era of Relative Price Shocks*, edited by Fry, R., Jones C. and Kent, C., pp. 305–33. Reserve Bank of Australia. Sydney.
- , Pearce, David and Stegman, A. 2009. Climate Change Scenarios and Long Term Projections. *Climatic Change* 97(1–2):23–47.
- and Sachs, Jeffrey 1991. *Global Linkages: Macroeconomic Interdependence and Co-operation in the World Economy*. Brookings Institution. June. (ISBN 0-8157-5600-3)
- and Stoeckel, Andrew. B. 2010. The Global Financial Crisis: Causes and Consequences. *Asian Economic Papers* 8(10).
- and Stoeckel, Andrew. B. 2011. Fiscal Consolidation and Global Rebalancing. Forthcoming report to the World Bank
- and Vines, D. 2000. Modelling Reality: The Need for Both Intertemporal Optimization and Stickiness in Models for Policymaking. *Oxford Review of Economic Policy* 16(4):106–37. (ISSN 0266903X)
- and Wilcoxon, Peter J. 1999. The Theoretical and Empirical Structure of the G-Cubed Model. *Economic Modelling* 16(1999):123–48.
- Obstfeld, M. and Rogoff, K. 1996. *Foundations of International Macroeconomics*. MIT Press, Cambridge MA.
- Organisation for Economic Co-operation and Development (OECD) 2010. *OECD Economic Outlook* no. 88. OECD. Paris.
- Reinhart, C. M. and Rogoff, K.S. 2010. Growth in a Time of Debt. *American Economic Review* 100.
- Woodford, M. 2010. Simple Analytics of the Government Expenditure Multiplier. *American Economic Journal: Macroeconomics* 3:1–35.