The Post-crisis Narrowing of International Imbalances

CYCLICAL OR DURABLE?

Patrice Ollivaud, Cyrille Schwellnus

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

25-Jun-2013
_____

English - Or. English

ECONOMICS DEPARTMENT

THE POST-CRISIS NARROWING OF INTERNATIONAL IMBALANCES - CYCLICAL OR DURABLE?

ECONOMICS DEPARTMENT WORKING PAPERS No. 1062

by Patrice Ollivaud and Cyrille Schwellnus

All Economics Department Working Papers are available through OECD's Internet Website at
http://www.oecd.org/eco/Workingpapers

JT03342370

ABSTRACT/RÉSUMÉ

The post-crisis narrowing of international imbalances -- cyclical or durable?

After peaking in the first half of 2008, international imbalances declined sharply during the global crisis of 2008-09, in part reflecting cyclical factors such as large contractions in domestic demand on the back of bursting housing bubbles in a number of deficit countries, as well as large declines in cross-border capital flows, interest rates and commodity prices. This paper suggests that business and housing cycles alone account for around half of the decline in international imbalances, with real exchange rate and fiscal adjustments explaining only around one fifth. A range of stylised scenarios for the major trading areas that extends the short-term projections in *OECD Economic Outlook No. 93* of May 2013 to 2020 suggests that in the absence of policy adjustments beyond 2014 international imbalances could rebound as output gaps gradually close and housing markets normalise, though to levels below the pre-crisis peak. Ambitious fiscal adjustment in countries with the largest remaining fiscal imbalances and selected structural reforms could offset the cyclical rebound in international imbalances and prevent diverging net asset positions in most areas. Moreover, ambitious fiscal and structural policy adjustments would provide some margin in case upside risks to international imbalances -- such as renewed housing booms that could be triggered by a rebound in cross-border capital flows or higher oil prices -- materialise.

JEL classification: F32; F40; E60
Keywords: Global imbalances; current account adjustment; macroeconomic policies

****

La baisse des déséquilibres mondiaux après la crise : cyclique ou durable ?

Après avoir atteint des sommets dans la première moitié de l'année 2008, les déséquilibres mondiaux ont largement baissé durant la crise de 2008-09, reflétant en partie des facteurs cycliques tels que la contraction de la demande intérieure liée notamment à l'éclatement des bulles immobilières dans de nombreux pays déficitaires, ou bien des diminutions importantes dans les flux internationaux de capitaux, les taux d'intérêt et les prix des matières premières. Ce papier soutient que les cycles liés à la conjoncture et au marché du logement expliquent à eux seuls environ la moitié de la baisse des déséquilibres mondiaux, tandis que les mouvements des taux de change et les corrections budgétaires seulement un cinquième. Un éventail de scénarios stylisés pour les principales zones commerciales qui étendent les projections à court-terme des *Perspectives économiques de l'OCDE No. 93* de mai 2013, jusqu'en 2020 suggère qu'en l'absence d'une révision des politiques au-delà de 2014, les déséquilibres mondiaux pourraient remonter du fait de la fermeture des écarts de production et de la normalisation sur le marché des logements, mais toutefois à des niveaux inférieurs au sommet d'avant la crise. Des ajustements budgétaires ambitieux pour les pays avec les plus importants déséquilibres budgétaires, ajoutées à des réformes structurelles sélectionnées peuvent contrebalancer la remontée cyclique des déséquilibres mondiaux et empêcher des positions nettes extérieures divergentes. En outre, des révisions ambitieuses des politiques budgétaires et structurelles fourniraient une marge en cas de réalisation de risques à la hausse sur les déséquilibres mondiaux, tels qu'un nouveau boom immobilier qui viendrait d'une remontée des flux internationaux de capitaux ou bien des prix du pétrole plus élevés.

Classification JEL : F32 ; F40 ; E60
Mots-Clés : Déséquilibres mondiaux ; ajustement des balances courantes ; politiques macroéconomiques

TABLE OF CONTENTS

Boxes

Tables

Figures

THE POST-CRISIS NARROWING OF INTERNATIONAL IMBALANCES -- CYCLICAL OR DURABLE?

by

Patrice Ollivaud and Cyrille Schwellnus[1]

1.   Introduction

1.   The decade preceding the global crisis of 2008-09 was characterised by widening external imbalances, which narrowed abruptly during the crisis. The pre-crisis build-up of imbalances partly reflected cyclical developments, such as diverging business cycles in surplus and deficit countries, commodity price booms, as well as asset price booms driven in part by cross-border capital flows. As these cyclical factors unwound during and in the wake of the crisis, imbalances between domestic saving and investment narrowed -- in some cases in a disorderly manner, in other cases more smoothly than had been feared before the crisis.

2.   Some of the domestic imbalances that led to the crisis would likely have developed to a lesser extent if financial flows had not financed large saving-investment imbalances, thereby resulting in large asset price misalignments. Although global current account imbalances partly reflect differences in economic fundamentals across countries, such as the stage of economic development or demographic patterns, various distortions can further amplify them (Obstfeld and Rogoff, 2010). In deficit countries, for instance, inadequate financial regulation can lead to asset price misalignments that attract large capital inflows. In surplus countries, foreign exchange accumulation as well as financial repression or weak social safety nets can result in 'saving gluts' and excessive current account surpluses (Bernanke, 2005). Historically, large current account deficits have often unwound in a disorderly fashion, with large spillover effects through financial and trade contagion (Kaminsky, 2008).[2]

3.   This paper examines recent developments and prospects for international imbalances out to 2020, and in particular whether recent narrowing reflects a durable rebalancing of demand. A reduced-form econometric framework is developed, which allows the decomposition of current account changes into the contributions from various standard determinants, including: business and housing market cycles relative to trading partners; real oil prices; real effective exchange rates; underlying fiscal balances relative to trading partners; and global interest rates. In contrast to the related literature (IMF, 2012) -- which analyses

---

2.   Lane (2012) notes that the current crisis in the euro area can be characterised as a classical balance of payments crisis following a sudden stop in private capital flows.

aggregate current account balances in a country panel setting and constrains coefficients to be equal across countries -- this paper models trade, oil and investment income balances separately and allows for country- or area-specific coefficients. For instance, the coefficient on the structural fiscal balance relative to trading partners is allowed to differ between a comparatively large and closed economy such as the United States and a smaller, more open economy such as the euro area deficit zone.

4.   The main findings of the paper are as follows:

- A substantial part of the post-crisis narrowing in global current account imbalances is due to cyclical factors, with more negative output gaps and depressed housing investment in deficit countries accounting for around half of the overall narrowing between mid-2008 and end-2012. The large decline in OECD interest rates also contributed to current account narrowing (20% of the overall narrowing) by reducing debt servicing costs for net external debtors and reducing investment income for net creditors. This suggests that in the medium term imbalances are likely to widen as output gaps close, housing markets normalise and interest rates return to neutral levels.[3]

- Real exchange rate movements and fiscal policies have tended to support global current account narrowing, with a particularly large post-crisis real exchange rate appreciation in China and, since 2010, greater fiscal consolidation in the United States and the euro area deficit zone than elsewhere.

- A range of stylised scenarios extending the short-term projections in *OECD Economic Outlook No. 93* (May 2013) to 2020 imply that under substantial policy adjustment global imbalances would remain well below their pre-crisis peak. However, without policy adjustment, current account balances in most of the major deficit and surplus zones would remain inconsistent with stable net external debt positions.

  - Ambitious fiscal consolidation in countries with the largest remaining fiscal imbalances combined with moderate real exchange rate realignments would prevent any further widening in global imbalances even as output returns to trend.

  - Selected structural reforms, desirable in their own right and for many countries in line with G20 commitments, could further reduce imbalances by influencing saving and investment. In deficit zones (especially euro area deficit countries) labour market reforms would bring current account balances closer to sustainable levels, while in a number of surplus zones (Japan and the euro surplus countries) product market deregulation, especially in sheltered sectors, would reduce surpluses. For China, the expansion of the welfare system and financial liberalisation would help to further reduce the surplus.

- A different set of scenarios -- high oil prices and renewed housing booms in current account deficit countries -- assesses potential upside risks to global imbalances. Under minimal policy adjustment, the simultaneous materialisation of these risks could raise current account imbalances to pre-crisis peaks.

---

3.   The slump in oil prices in 2009 was a significant factor behind the immediate contraction in global imbalances, but the subsequent recovery has led again to a pick-up in the oil exporters' surplus so that the estimated contribution of oil prices to the overall narrowing of global imbalances is negligible.

5.   The remainder of this paper is structured as follows. Section 2 gives a short descriptive overview of current account developments before, during and in the wake of the global economic crisis of 2008-09, with a particular focus on real exchange rate and fiscal policy developments, as well as on capital flows. Section 3 explains the methodology and data used for the econometric decomposition of current account balances, the results of which are presented in Section 4. Section 5 provides illustrative scenarios for global imbalances in the medium term under alternative assumptions regarding the main current account determinants, including real exchange rates, fiscal and structural policies, oil prices, and residential investment ratios. The annexes provide details on the methodology and estimation results.

2.   Recent developments in global imbalances

6.   Global imbalances, measured as the sum of absolute current account balances in the major surplus and deficit zones, peaked at historical highs of around 5% of global GDP in early 2008, before narrowing to around 2½ per cent of global GDP in the wake of the crisis (Figure 1).[4] The pre-crisis widening and subsequent narrowing of global imbalances partly reflects real-economy demand developments, such as diverging business cycles across surplus and deficit zones, as well as financial-account developments, with the pre-crisis boom in capital flows followed by a large decline.

---

4.   The scale of global imbalances depends on the level of zone aggregation, but their profile over the period 2000-12 is similar when calculated at the individual-country level (see *OECD Economic Outlook* May 2013). The euro area surplus zone is here defined to include euro area members for which the current account surplus was on average larger than 1% of GDP over the period 2000-05 (Austria, Belgium, Germany, Finland, Luxembourg and the Netherlands). The euro area deficit zone includes the remaining members of the OECD euro area (France, Estonia, Greece, Ireland, Italy, Portugal, the Slovak Republic, Slovenia and Spain). Excluding France, for which the current account was broadly balanced over the period, in the euro area surplus zone rather than the deficit zone does not significantly change any of the results reported below.

Figure 1. Global current account imbalances have narrowed in the wake of the crisis

Per cent of world GDP
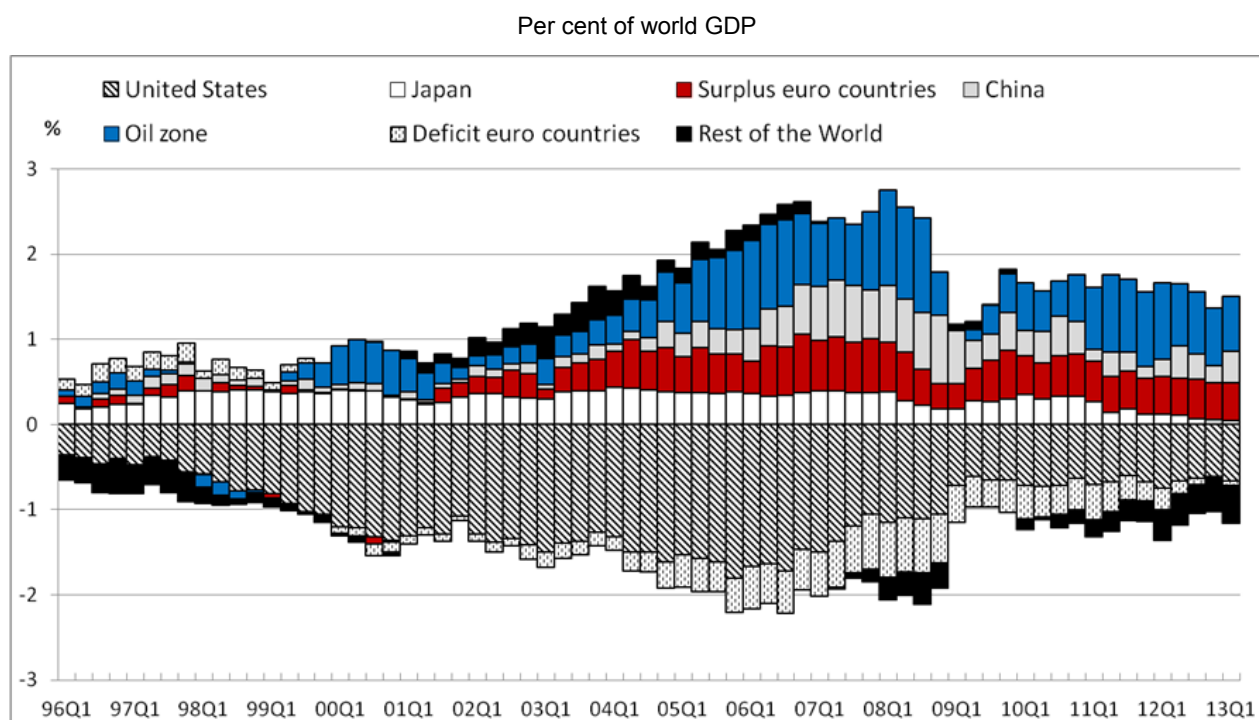
Source: OECD Economic Outlook 93 database and OECD calculations.

7.   In the run-up to the crisis, estimated output gaps were typically more positive in deficit than surplus countries, boosting current account imbalances. In turn, the larger contraction of domestic demand and output in deficit countries than in surplus countries during and after the crisis -- which partly reflected the drying up of external financing associated with the collapse in cross-border capital flows -- reduced global current account imbalances. This suggests global balances may re-emerge to some extent as output returns to potential.

8.   The profile of commodity prices has also had an important influence on movements in global imbalances. The increase in real oil prices (normalised on the US GDP deflator) averaged 17% per year from the beginning of the millennium to the pre-crisis peak in mid-2008, coinciding with a large build-up in the surplus of oil exporting countries and aggravating the deficits of many oil importing countries. The slump in oil prices over the following year, in which prices more than halved, led to a dramatic fall in the oil exporters' surplus and was a significant factor behind the immediate contraction in global imbalances. The subsequent recovery in oil prices, although to levels which in April 2013 remained some 30% below the pre-crisis peak in real terms, has led again to a pick-up in the oil exporters' surplus, although to levels which remain below the pre-crisis peaks.

9.   Fiscal policies contributed to the widening of global imbalances in the run-up and during the global crisis of 2008-09, but since 2010 large fiscal adjustments in current account deficit zones have reduced current account imbalances. The change in the structural fiscal balance before the crisis was particularly pronounced in the United States, where the balance declined by around 4½ per cent of

potential GDP between 2000 and 2007.[5] Perhaps surprisingly, fiscal policy played no role in the increase of the euro area deficit zone's current account deficit before the crisis, with the structural fiscal balance remaining broadly constant over the same period. In 2008-09, large fiscal expansions in the United States and the euro area deficit zone contributed to further current account widening, but the subsequent large fiscal adjustments – especially in the euro area deficit zone -- reduced current account deficits in these zones.

10.   Financial account developments may have driven some of the real-economy demand developments behind the pre-crisis widening and subsequent narrowing of global imbalances (Figure 2). Before the crisis, current account deficit countries enjoyed easy access to external finance as investors chasing higher returns were under-pricing risk and cross-border capital flows boomed. Large foreign exchange accumulation by some current account surplus countries may have exacerbated the pre-crisis boom in cross-border capital flows and contributed to exchange rate misalignment.[6] In some current account deficit countries capital inflows contributed to asset price booms, including in the housing market, which burst when sharp increases in risk aversion resulted in a bust in cross-border capital flows and tighter access to external finance.

Figure 2. Global capital flows

Per cent of global GDP
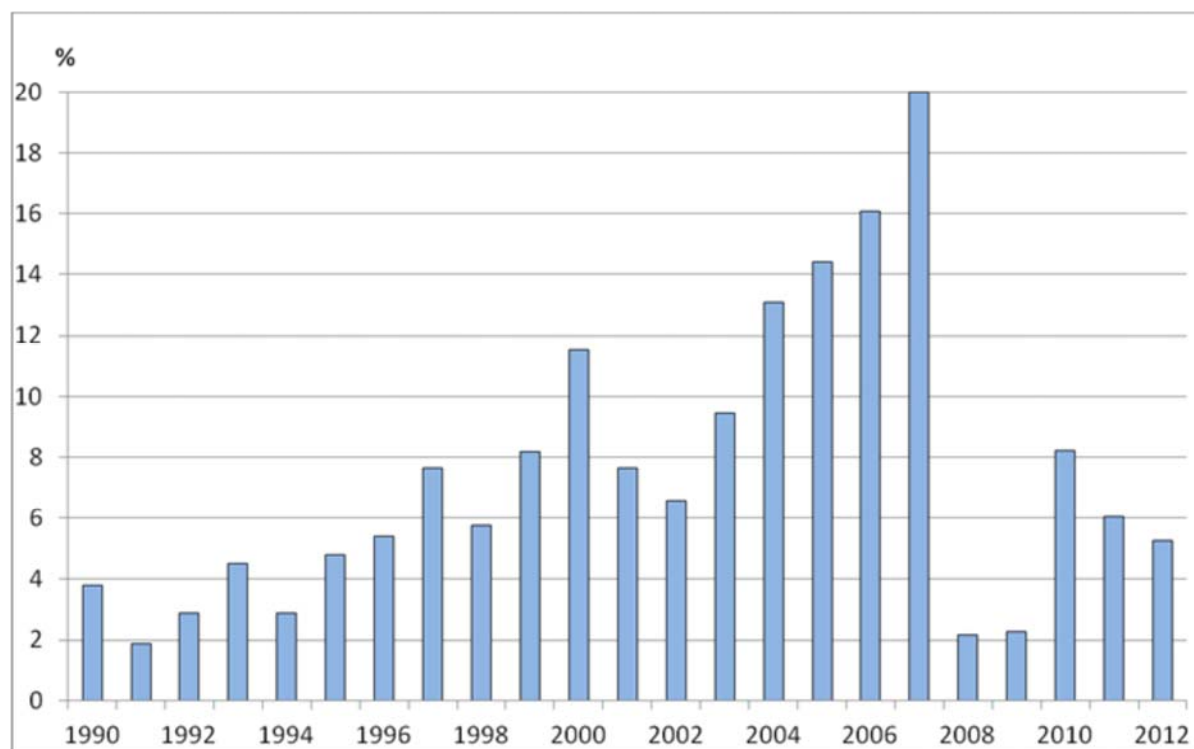
Note: Calculated as the average of gross capital inflows and outflows in USD divided by world GDP in USD.

Source: IMF World Economic Outlook database.

5.   The structural fiscal balance is a more appropriate measure of the influence of fiscal policy changes on the current account balance than the headline fiscal balance which confounds the effects of discretionary policy changes and the business cycle.

6.   For instance, depending on the methodology and sample period, estimates of China's real equilibrium exchange rate at the onset of the crisis range from 50% undervaluation to small overvaluation, with most estimates in the range of 10 to 20% undervaluation (see Chinn, 2012, for a survey).

11.   The pattern of capital flows in the wake of the crisis suggests that in the euro area, financial account developments may have contributed to post-crisis current account narrowing to a larger extent than in the United States. In the run-up to the crisis both the United States and the euro area deficit zone received large net private capital inflows, with net inflows averaging around 5-6% of GDP between 2005 and 2008. These developments were mirrored in large net private capital outflows in surplus countries. China and oil exporters accumulated large net bilateral asset positions with the United States, with a large bias toward Treasury and Agency debt (Bernanke *et al.*, 2011). While in the United States, a short-lived retrenchment in private capital flows in 2009 was followed by large net private capital inflows in 2010-12 as the United States benefited from safe haven status, private net capital inflows into the euro area deficit countries continued well into 2009, but suddenly started to reverse in 2010. Large official net capital inflows -- mainly increases in central bank liabilities -- partly compensated large negative net capital outflows, preventing some of the symptoms of a classical balance-of-payments crisis. However, the pattern of capital flows suggests that tighter external financing conditions contributed significantly to current account narrowing in euro area deficit countries.

12.   The global fall in interest rates in the wake of the global crisis reduced debt servicing costs for net external borrowers, thereby contributing to current account narrowing. In the United States and the euro area deficit zone, the balance of investment income increased by around ½ percentage point of GDP between 2007 and 2012 despite large cumulated current account deficits, while it remained constant in Japan and declined in China despite cumulated current account surpluses over the same period.

3.   An empirical framework for analysing global imbalances

13.   The empirical analysis of current account determinants is conducted separately for each current account component and for each major surplus and deficit zone. The estimation of different reduced-form empirical models for the different current account components (non-oil trade balance, oil trade balance and balance of investment income) allows the inclusion of component-specific current account determinants while avoiding potential collinearity issues.[7] The disaggregated zone-by-zone analysis additionally allows the estimated coefficients of current account determinants to vary across zones whereas in panel data studies estimated coefficients are generally constrained to be equal across countries (IMF, 2012). The flipside is that the global adding-up constraint is not necessarily respected. However, although the empirical model does not strictly impose global consistency of current account changes, most relevant explanatory variables are measured relative to trading partners, ensuring that in the simulations global discrepancies are small.[8]

---

7.   For instance, there is no *a priori* rationale for including the oil price in the equation for the non-oil trade balance or housing investment in the oil balance equation while both would need to be included in the overall current account balance equation. It should be noted that the estimated partial correlation of a given explanatory variable with the aggregate current account balance can be obtained as the sum of its partial correlations across current account components (as in the regression analysis current account components are expressed as shares of GDP), but the direction of causality is difficult to establish.

8.   In the simulations, changes in the global current account discrepancy -- *i.e.* the sum of current account balances across all zones -- amount to less than 0.2% of global GDP (see Annex A2 for details on the global consistency of the simulated current account developments).

Non-oil trade balances

14.   The determinants of non-oil trade balances are assessed by applying a two-step procedure which first regresses quarterly non-oil trade balances (in per cent of GDP) on relative output gaps, *i.e.* the difference between the domestic output gap and trading partners' trade-weighted output gaps. Relative output gaps in this setup account for all business cycle-related changes in current account balances, including business cycle-related fluctuations in real exchange rate or asset prices. The estimated equation takes the following form:

$$NOTB_t = \sigma_{\text{NOTB}} + \sigma_{\text{NOTB}}^{YGAP} \cdot YGAP_t^{rel} + \sigma_T T_t + \varepsilon_{NOTB,t}, \tag{1}$$

where $NOTB_t$ is the the non-oil trade balance (in percent of GDP); $YGAP_t^{rel}$ the relative output gap; σ_{NOTB}^{YGAP} the estimated coefficient of the relative output gap; σ_{NOTB} is the regression constant; T_t is a deterministic trend; and $\varepsilon_{NOTB,t}$ is the error term. The business cycle-adjusted non-oil trade balance is then recovered from this regression as:

$$NOTB_t^{adj} = NOTB_t - \sigma_{\text{NOTB}}^{YGAP} \cdot YGAP_t^{rel}. \tag{2}$$

15.   In a second step, business cycle-adjusted non-oil trade balances are regressed on a number of standard determinants in an error correction setup: the real effective exchange rate; the relative underlying fiscal balance measured as the difference between the domestic underlying fiscal balance and trading partners' trade weighted underlying fiscal balances; and the relative residential investment gap measured as the difference between the deviation of the domestic residential investment-to-GDP ratio from its long-term average and trading partners' trade-weighted deviation.[9] The equation for China includes a deterministic time trend reflecting rapid structural change over the estimation period not captured by the other explanatory variables and some equations include dummy variables to correct for outliers (see Annex A1 for detailed estimation results). In the scenario analysis, the deterministic trend in the equation for China is gradually phased out over the scenario horizon to ensure that simulation results are mainly driven by projections of current account determinants rather than past trends. The estimated equations take the following generic form:[10]

$$\Delta NOTB_t^{adj} = \alpha\big(NOTB_{t-1}^{adj} - \theta_x X_{t-1} - \theta_T T_t\big) + \sum_{j=0}^{p} \beta_{3j} \Delta X_{t-j} + \beta_0 + u_t, \tag{3}$$

where $NOTB^{adj}$ is the business cycle-adjusted non-oil trade balance in per cent of GDP; X_{t-1} denotes explanatory variables; T denotes deterministic trends and structural breaks; the subscript t indexes periods; α, β, θ denote estimated coefficients; and u is the regression residual.

---

9.   The long-term average of the residential investment-to-GDP ratio is computed over the period 1980-2012. Computing longer averages while excluding the boom-and-bust cycle of 2000-12 does not affect the reported results.

10.   Standard unit root tests show that current account balances and output gaps are generally (trend-) stationary, justifying the simple level regression in the first step of the analysis. By contrast, over the sample period, real effective exchange rates and (structural) fiscal balances are generally integrated of order one, which is dealt with by estimating error-correction models. Standard cointegration tests support co-integration between business cycle-adjusted current account balances and the included explanatory variables. Regression diagnostics do not support the inclusion of lags of the dependent variable in equation (3).

Oil balances

16.   The determinants of oil balances are assessed using a similar two-step procedure as for non-oil trade balances, the main difference being that in the first step oil balances are regressed on *domestic* output gaps rather than *relative* output gaps. In the second step, oil balances are regressed on real oil prices.[11] Regressing oil balances on domestic output gaps rather than relative output gaps reflects that relatively few countries are net oil exporters and so developments in other countries are unlikely to affect their oil balance except insofar as they change the world oil price.

Investment income balances

17.   The balance of investment income is driven by changes in external assets and liabilities as well as fluctuations in rates of return. At constant rates of return, an increase in external liabilities reduces the balance of investment income while an increase in external assets increases it. Rates of return on external assets and liabilities are in part driven by world interest rates: Increases in world interest rates generally drive up rates of return on assets and liabilities, thereby reducing the balance of investment income in net external debtor countries while raising the balance in creditor countries.[12] In the empirical analysis, implicit rates of return on assets and liabilities are regressed on a measure of aggregate OECD short-term interest rates:

$$RA_t = \mu + \sigma^{RA} \cdot IRS_t + \varepsilon_t ,$$
(4a)

$$RL_t = \mu + \sigma^{RL} \cdot IRS_t + \varepsilon_t,$$
(4b)

where RA_t and RL_t are the implicit rates of return on external assets and liabilities measured as the ratios of gross investment flows to external assets and liabilities in period *t-1*; μ is the regression constant, IRS_t is the OECD nominal short-term interest rate, σ^{RA} is the estimated marginal effect of a 1 percentage point increase in the aggregate OECD interest rate on implicit rates of return; and ε_t the error term.[13] The estimated contribution of OECD interest rate fluctuations over the period $t - t_0$ on the balance of investment income can then be recovered as:

$$CIRS_t = \left(\widehat{RA}_t - \widehat{RA}_{t0}\right)A_{t0} - \left(\widehat{RL}_t - \widehat{RL}_{t0}\right)L_{t0},$$
(5)

---

11.   Algebraically, business cycle-adjusted oil trade balances are recovered as $OTB_t^{adj} = OTB_t - \sigma_{\text{OTB}}^{YGAP} \cdot YGAP_t$, where $\sigma_{\text{OTB}}^{YGAP}$ is the estimated coefficient on the domestic output gap from the regression $OTB_t = \sigma_{\text{OTB}} + \sigma_{\text{OTB}}^{YGAP} \cdot YGAP_t + \varepsilon_{OTB,t}$. Business cycle-adjusted oil trade balances are then regressed on real oil prices in an error correction setup: $\Delta OTB_t^{adj} = \alpha\left(OTB_{t-1}^{adj} - \theta_x P_{t-1} - \theta_T T_t\right) + \sum_{j=1}^{p} \beta_{3j} \Delta P_{t-j} + \beta_0 + u_t$. The euro area surplus and deficit zones include deterministic trends in the in oil balance equation, which in the scenario analysis are gradually phased out over the first two years of the scenario horizon.

12.   Depending on the composition of external assets and liabilities -- *e.g.* whether they consist mainly of equity or debt -- changes in world interest rates may have larger effects on assets or liabilities.

13.   The aggregate OECD interest rate is defined as the GDP-weighted average of 3-month interbank interest rates.

where $\widehat{RA}_t$ and $\widehat{RL}_t$ are the predicted values of equations (4a) and (4b) in period t, $\widehat{RA}_{t0}$ and $\widehat{RL}_{t0}$ are the predicted values in period t_0, and A_{t0} and L_{t0} are initial stocks of external assets and liabilities.[14]

Data

18.   Current account balances and most explanatory variables used in the estimations -- including output gaps, housing investment-to-GDP ratios, structural fiscal balances, real effective exchange rates and oil prices -- are taken from the *OECD Economic Outlook No. 92* (November 2012) database. Real effective exchange rates are based on relative unit labour costs and real oil prices are calculated as the Brent crude price in USD converted to national currency and deflated by the national GDP deflator. Data on gross external assets and liabilities are from the IMF IFS database.

Main results

19.   On average, an increase in the relative output gap is associated with a decrease in the current account balance of 0.4% of GDP, but the point estimate ranges from -0.1 in Japan to -0.5 in the United States (Table 1). The estimations further suggest that fluctuations in oil prices are associated with larger changes in current accounts in the United States and China than in the euro area or Japan. The large estimated coefficients in the United States and the euro area on relative housing investment-to-GDP ratios -- that is estimated to significantly affect current account balances after adjusting them for the business cycle -- suggests that this variable may partly capture other elements of the financial cycle not included in the estimated equations, such as domestic credit developments or other asset prices.[15]

---

14.   Similarly, the contribution of changes in external assets and liabilities to changes in the balance of investment income can be computed by multiplying initial implicit rates of return in period t_0 by changes in external assets and liabilities.

15.   Due to data limitations, for oil exporters, the regression analysis was conducted in one step using the total trade balance with an error correction model including the real oil price and the trade-weighted output gap of trading partners as explanatory variables. The estimated semi-elasticities are 0.9 for the trade-weighted output gap of trading partners (response to a 1 percentage point increase) and 7.0 for the real oil price (response to a 100% increase in the real oil price). Given the different estimation setup, these semi-elasticities are not directly comparable with the estimated coefficients for the other zones and are therefore not reported in Table 1.

Table 1. Summary table of estimated long-run semi-elasticities

	United States	Euro area deficit	Japan	Euro area surplus	China
Relative output gap[1]	-0.5	-0.4	-0.1	-0.4	-0.4
Real oil price[2]	-1.1	-0.3	-0.3	-0.3	-1.0
Real effective exchange rate[3]	-0.5	-0.6	-0.4	-0.8	-0.6
Relative underlying fiscal balance[4]	0.5	0.3	0.3	0.4	0.6
Relative housing investment[4]	-0.9	-1.2	-0.5	-1.1	
OECD short-term interest rate[5]	-0.1	-0.2	0.3	0.2	0.2

1. Response of current account balance (per cent of GDP) to a 1 percentage point change.
2. Response of current account balance (per cent of GDP) to a 100% increase in the real oil price.
3. Response of current account balance (per cent of GDP) to a 10% real effective exchange rate appreciation.
4 Response of current account balance (per cent of GDP) to 1% of GDP change.
5. Response of current account balance (per cent of GDP) to 1 percentage point change at the 2011 level of net foreign assets.

Source: OECD Economic Outlook 92 database and OECD calculations.

4. Quantifying factors behind the build-up and narrowing of current account balances

20. Diverging business cycle developments across surplus and deficit countries alone cannot account for the evolution of current account balances since 2000, suggesting that other factors played a role, including: exchange rate and fiscal policy developments; fluctuations in oil prices; housing booms and busts; as well as interest rates. This section attempts to quantify the contributions of each of these factors. The calculations are illustrative only, as the direction of causality between the variables included in the empirical analysis is difficult to establish. For instance, most factors influencing real exchange rates tend to also directly influence current account balances.

Relative output gaps

21. Business cycle developments aggravated global current account imbalances between 2000 and 2007, but contributed to current account narrowing thereafter. Before the global crisis of 2008-09, large positive output gaps in traditional current account deficit countries such as the United States or the euro area deficit zone boosted import growth while less positive or negative output gaps raised the trade balance in a number of current account surplus countries, such as Japan, the euro area surplus zone and China. By contrast, business cycle developments in the wake of the crisis supported current account narrowing, as output and hence imports declined by more in current account deficit countries than in surplus countries.

22. Using relative output gaps to adjust current account balances for business cycle developments, shows larger business cycle effects in the wake of the crisis than before.[16] In the United States, business cycle effects increased the current account deficit by around ¾ per cent of GDP between 2000 and 2006 on

---

16. The analysis is predicated on current OECD estimates of output gaps, but there is currently large uncertainty surrounding these estimates. If relative output gaps of current account deficit countries before the crisis were systematically more positive than currently estimated -- for instance reflecting an overestimate of potential output -- then the cyclical component before the crisis may be downward biased. By contrast, if potential output in deficit countries is currently overestimated, then the cyclical component after the crisis may be upward biased.

average, while the large negative output gap relative to trading partners reduced the trade deficit by around 1¼ per cent of GDP in 2011 and 2012 (Figure 3). In the euro area deficit zone, business cycle effects in the

Figure 3. Business cycle-adjusted current account balances (2000-12)

Per cent of GDP
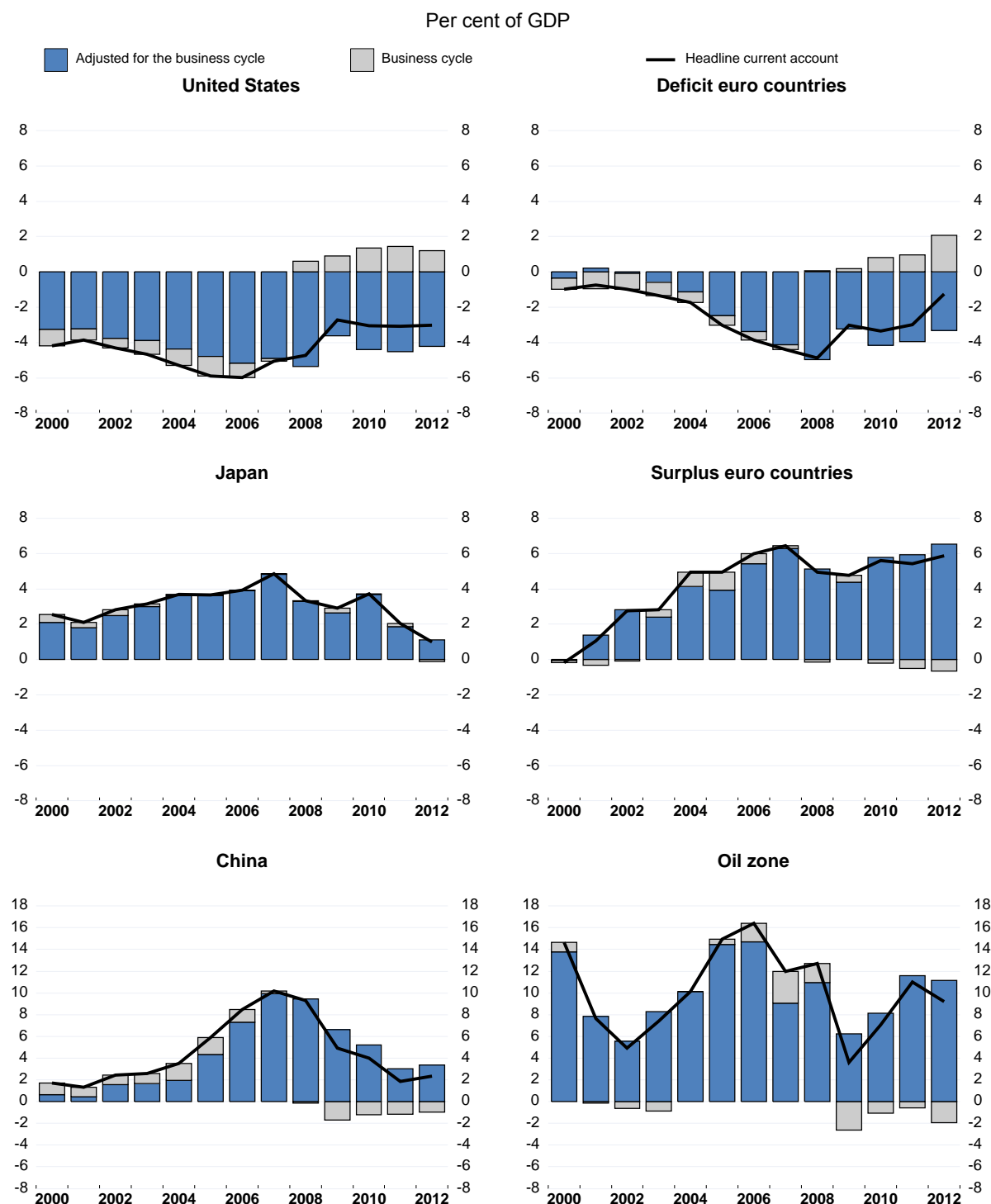
1. Calculated as the difference between domestic output gap and trade-weighted sum of foreign output gaps.

Source: OECD Economic Outlook 93 database and OECD calculations.

run-up to the crisis were somewhat smaller than in the United States, but large in 2012, increasing the trade balance by about 2% of GDP. The main counterparts to the business cycle-driven increases in current account balances in deficit countries in the wake of the crisis are China and oil-exporting countries, where increased output gaps relative to trading partners reduced current account surpluses. In Japan and the euro area surplus zone, business cycle effects on current account balances since 2000 have been more muted.[17]

23.   The results imply that the cyclically-adjusted current account positions of the United States and euro area deficit countries have improved since the crisis but only by about 1 and 2% of GDP, significantly less than the observed improvement in headline current balances (Figure 3). Among surplus zones, business cycle-adjusted current account balances declined in Japan, China and oil producers while they remained similar to the levels immediately preceding the crisis in euro area surplus countries and oil producers.

Housing cycle

24.   Easy access to external financing in the run-up to the crisis was reflected in credit and housing booms in several current-account deficit countries. In the United States, real house prices (normalised on the private consumption deflator) increased by around 40% over the period 2000-06 and by 70% in euro area deficit countries. These house price booms diverted resources from the tradable to the non-tradable sectors, thereby raising current account deficits even beyond the direct effects on aggregate demand.[18] In the United States, for instance, the ratio of residential investment to GDP increased from 4½ per cent of GDP in 2000 to around 6% in 2006, while it increased from 6% of GDP to 7½ per cent in the euro area deficit zone. The regression analysis suggests that housing developments contributed significantly to the widening of current account deficits in deficit countries (Figure 4).

25.   The global crisis of 2008-09 was associated with housing busts in the United States and a number of euro area deficit countries. In the United States and in the euro area deficit zone real house prices fell by about 20% between the pre-crisis peak and the end of 2012. Residential investment declined from 6% of GDP in 2006 to 2½ per cent at the end of 2012 in the United States, with even larger declines in Spain (12½ per cent of GDP to 5½ per cent) and Ireland (13½ per cent of GDP to 2%). In surplus zones for which residential investment data are available (Japan, euro area surplus zone), developments in residential investment were more muted.[19]

26.   On the basis of the regression analysis, about half of the decrease in global imbalances following the crisis from a peak of around 5% of global GDP in early 2008 to around 2½ per cent at the end of 2012 reflected business and housing cycle developments, with business and housing cycle-adjusted global imbalances remaining at around 3¾ per cent of global GDP at the end of 2012 (Figure 5). As output gradually returns to potential and housing investment normalises in the medium term, global imbalances may widen again.

---

17.   The sum of business cycle adjustments across surplus and deficit in 2012 was below 0.2% of global GDP, implying that business cycle adjustments broadly satisfy the global adding-up constraint.

18.   In the empirical analysis aggregate demand effects are captured by relative output gaps.

19.   Data on residential investment are unavailable for China and the oil exporter zone.

Figure 4. The residential investment cycle has contributed to current account imbalances

Per cent of GDP

United States

Euro deficit countries
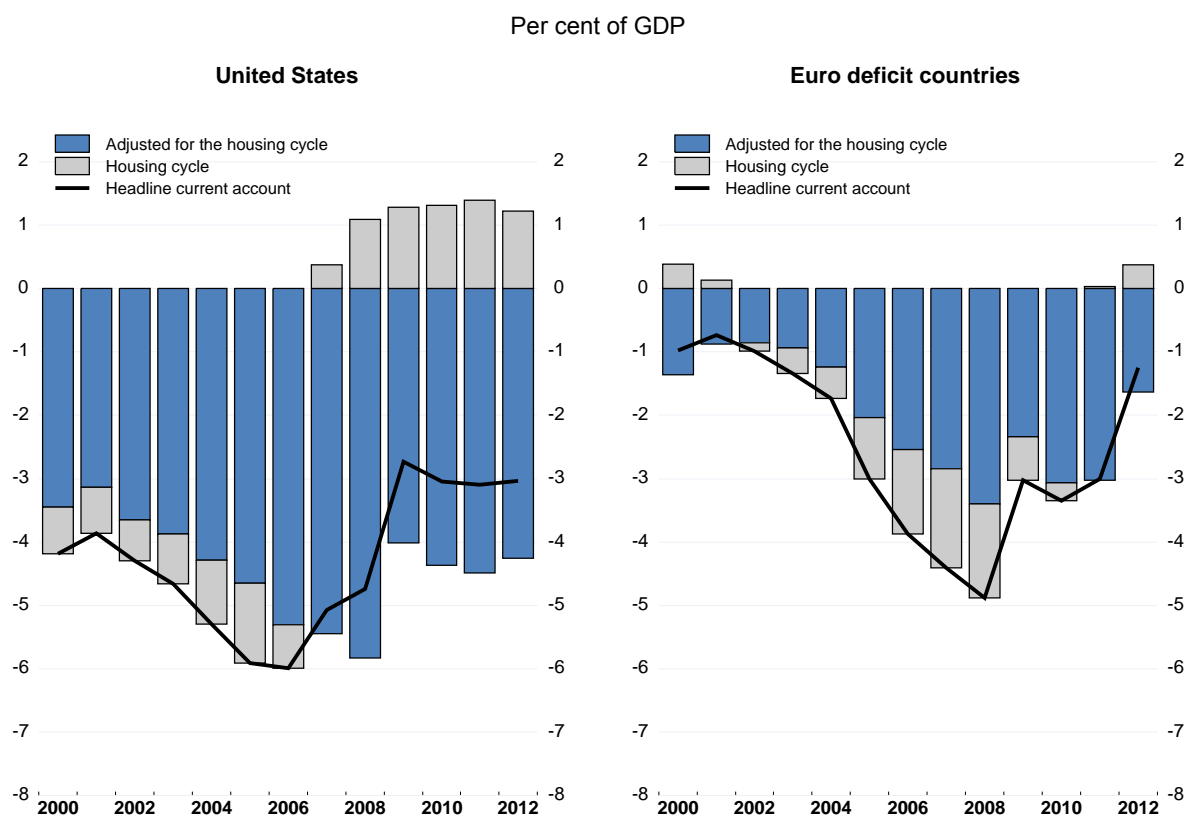
Source: OECD Economic Outlook 93 database; and OECD calculations.

**Figure 5. Business and housing cycle-adjusted global current account imbalances**
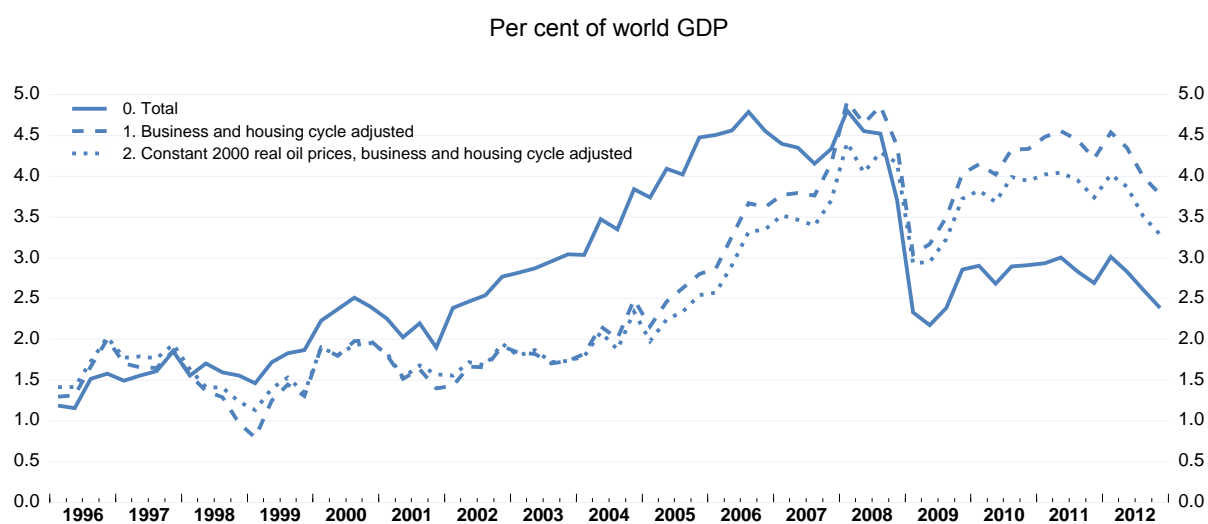
Per cent of world GDP

Note: Calculated as the sum of the absolute values of current account balances in dollars divided by the sum of GDP in dollars.

Source: OECD Economic Outlook 93 database; and OECD calculations.

Table 2. Drivers of global current account imbalances

	1996	2008	2009	2012
(0) Actual	1.4	4.4	2.4	2.7
(1) = (0) adjusted for the business cycle	1.6	4.6	2.9	3.5
(2) = (1) + adjusted for the housing cycle	1.6	4.7	3.4	4.2
(3) = (2) + real oil prices at 2000 levels	1.6	4.2	3.2	3.7
(4) = (3) + underlying fiscal balances at 2000 levels	1.4	3.0	1.7	2.6
(5) = (4) + real effective exchange rates at 2000 levels	1.6	3.2	2.0	3.1
(6) = (5) + OECD interest rates at 2000 levels	1.7	3.4	2.4	3.7

Note: Calculated as the sum of the absolute values of current account balances in dollars divided by world GDP in USD.

Source: OECD Economic Outlook 93 database; and OECD calculations.

Oil prices

27.   While it is not clear how much of the pre-crisis increase in oil prices reflected a trend increase and how much was cyclical, rising oil prices reduced current account balances in oil-importing countries and raised the surpluses of oil exporters. Real oil prices doubled over the period 2000-06 and peaked in mid-2008 at almost four times the level in the year 2000. The US oil deficit reached 2.7% of GDP in 2008 (up from 0.9% in 2000) while the current account surplus of oil exporters increased from 5% of GDP to 13%, accounting for a major component of the increase in global current account imbalances. That said, oil price developments before the global crisis of 2008-09 also reduced current account surpluses in many surplus countries, with the oil deficit increasing from 1.2% of GDP in 2000 to 3.2% of GDP in 2008 in China and from 0.4% of GDP to 1.1% in Japan. In the euro area fluctuations in oil balances were less pronounced, with oil deficits increasing by around ¼ per cent of GDP over the period 2000-08.

28.   If real oil prices had remained at the levels of the year 2000, before the crisis global imbalances would have been around ½ per cent of global GDP lower (Figure 4, Table 2). The post-crisis decrease in real oil prices also contributed to the narrowing of global imbalances in the wake of the crisis, as suggested by the smaller decline in (business and housing cycle-adjusted) current account imbalances at constant oil prices than at actual oil prices (Figure 4). This said, the counter-factual of an unchanged real oil price may not appropriately capture a notion of underlying oil balances. Indeed, the forces of demand and supply were probably such that the underlying development was a trend increase.

Fiscal policies

29.   In the run-up to the global crisis of 2008-09 and during the crisis, fiscal policies contributed to current account widening (Table 2). Regression analysis suggests that the large decline in the relative structural fiscal balance of the United States from 2000 to 2006 raised its current account deficit by around 1% of GDP, while the contemporaneous large increase in China raised its current account surplus by around 3% of GDP. Improvements in the structural fiscal balance also contributed to significantly raise the current account surplus of the euro area surplus zone (around ¾ per cent of GDP) while the contribution of fiscal policy to current account developments was more neutral in Japan and the euro area deficit zone. Between the first quarter of 2008 and the end of 2009 relative structural fiscal balances declined in the United States and euro area deficit countries while increasing in all major surplus zones, further contributing to current account widening.

30.   Fiscal policies have contributed to reduce global imbalances only since 2010. Reflecting the relatively faster pace of fiscal consolidation in deficit zones after 2009, especially in euro area deficit countries, fiscal policies have contributed to current account narrowing in most zones between 2010 and 2012. Overall, the empirical analysis indicates that fiscal policies played a significant role in driving current account imbalances, especially in the run-up to the global crisis.

Exchange rates

31.   Overall movements in pre-crisis real exchange rates did little to constrain the growth of imbalances, so that there was no general tendency for real exchanges rates to depreciate in deficit zones and appreciate in surplus zones. In Japan and the euro area real exchange rate developments aggravated current account imbalances, whereas the small real exchange rate depreciation in the United States (about 10% over the period 2000-06) constrained the widening of the current account deficit only marginally. In China, the real effective exchange rate, here measured in terms of relative unit labour costs, appreciated by around 15% over the period 2000-06 and another 15% over the period 2006-08, thereby slowing the rise in the current account surplus. However, a number of empirical studies indicate that bringing the real exchange rate in line with fundamentals would have implied a larger real appreciation of the currency (Chinn, 2012).

32.   Real exchange rate appreciation has substantially reduced the Chinese surplus since the economic crisis, explaining about 3½ percentage points of GDP of the overall decline in the surplus of 7½ per cent between 2007 and 2012. For other countries, real exchange rate developments have also facilitated post-crisis current account adjustment by supporting the switching of expenditure between domestic output and imports. Real exchange rates generally appreciated in current account surplus zones whereas they generally depreciated in deficit zones, as illustrated by estimated real exchange rate contributions to current account adjustment generally falling into the shaded areas in Figure 6. However, reflecting partly the nominal depreciation of the euro, the real effective exchange rate of euro area surplus countries depreciated in the wake of the crisis, which precluded current account adjustment through expenditure switching. The relatively small effect from real exchange rate adjustment in the euro area deficit zone partly reflects small adjustment in relative unit labour costs in some of the larger countries (notably Italy), whereas in those smaller euro area deficit countries which have been under most pressure from financial markets there has been a substantial fall in relative unit labour costs.

Figure 6. Contributions of real exchange rates to post-crisis current account adjustment (2007-12)

Per cent of GDP
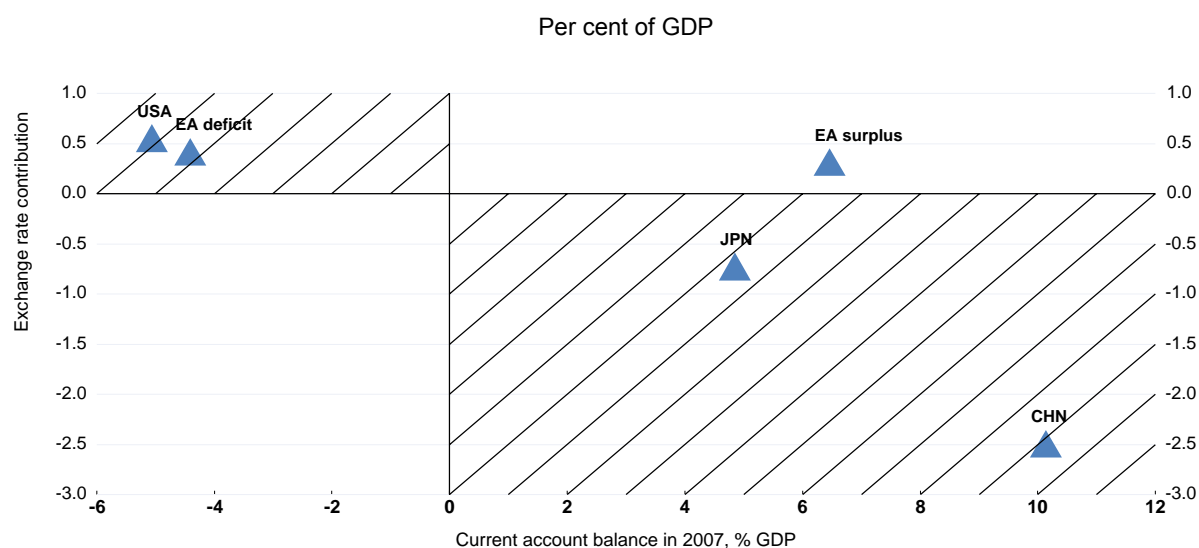
Note: Exchange rate contribution is calculated as the change in the real effective exchange rate multiplied with the estimated long-term coefficient on the real effective exchange rate in equation (3).

Source: OECD Economic Outlook 93 database; and OECD calculations.

Interest rates

33.   Interest rates played a minor role in the widening of global imbalances in the run-up to the crisis (Table 2). In 2007 OECD aggregate short-term interest rates were at similar levels as in 2000 (5% in 2007 as compared to 6½ per cent in 2000). Significant increases in the investment income balance from 1¼ per cent of GDP to 3¼ per cent in Japan and from -½ per cent of GDP to 1% in the euro area surplus zone between 2000 and 2007 mainly reflected large cumulated current account surpluses and the consequent build-up of large net external asset positions. Over the same period, the modest decrease in aggregate OECD short-term interest rates contributed to limiting the decline in the euro area deficit zone's balance of investment income to ¾ per cent of GDP, whereas the small increase in the investment income balance of around ½ per cent of GDP in the United States despite large cumulated current account deficits mainly reflected favourable valuation effects on net external assets.

34.   Over the period 2007-12, despite a deterioration in its net external liability position, the US investment income balance increased by more than ½ per cent of GDP, reflecting in part the large post-crisis decline in aggregate OECD short-term interest rates from around 5% in 2007 to 1¼ per cent in 2012 (Figure 7).[20] In external creditor zones (euro area surplus zone, Japan, China, oil exporters) interest rates contributed negatively to the balance of investment income, although in Japan, the euro area surplus zone and to a lesser extent in oil exporters the negative contribution from interest rate declines was partly offset by the positive contribution from higher net external assets.

35.   Increases in interest rates to more conventional levels may significantly raise global imbalances going forward. Over the period 2007-2012, increases in the balance of investment income in current account deficit zones and declines in surplus zones contributed around 0.4% of global GDP to current account narrowing (equivalent to 20% of the overall narrowing) despite effects from interest declines being partly offset by developments in net foreign assets. To the extent that net foreign creditors continue running sizable current account surpluses and net foreign debtors continue running sizable current account deficits, in the medium term the contributions to the investment income balance from changes in net foreign assets could amplify the contributions from a normalisation of world interest rates.

---

20.   Short term interest rates in 2012 were around ½ per cent in the United States and the euro area and around 1% in the United Kingdom but significantly higher in some other countries, such as Australia, Mexico, Korea or Turkey.

Figure 7. Changes in investment income balances over the period 2007-12

Per cent of GDP
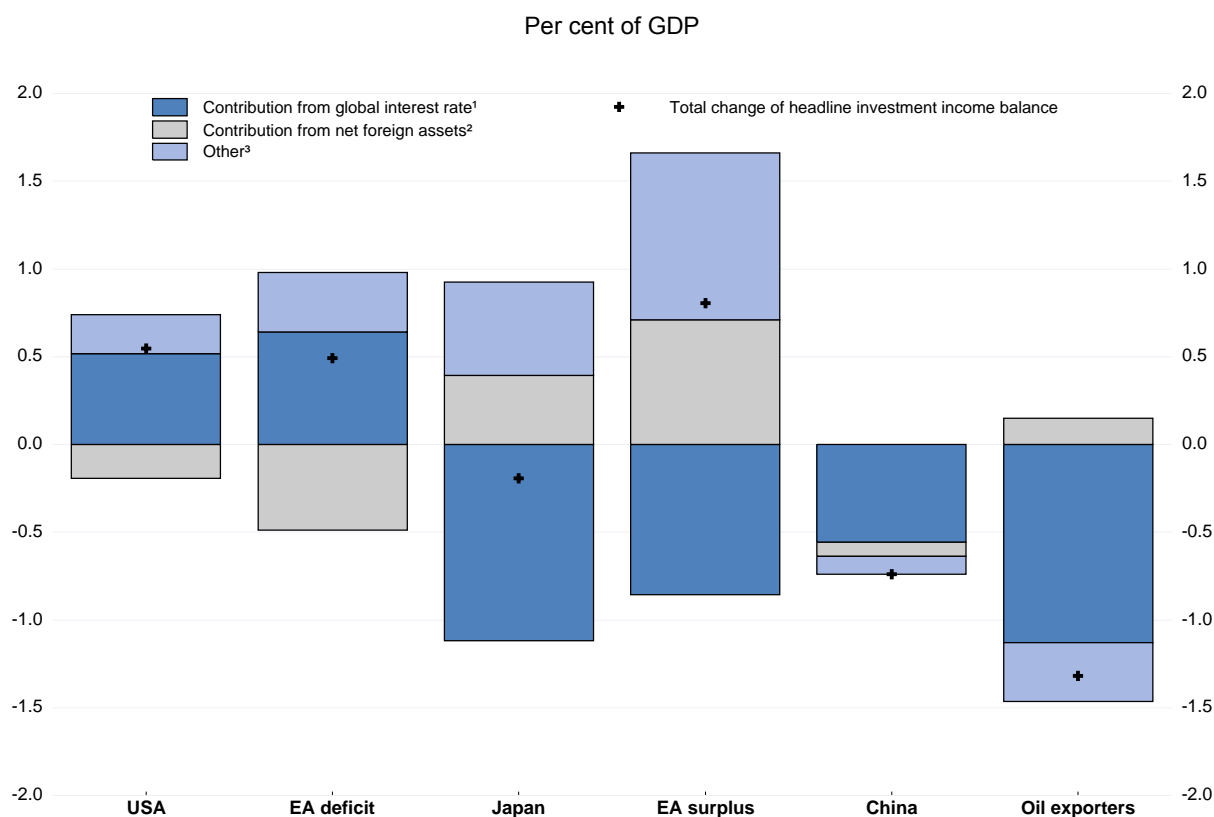
1. Changes in the balance of investment income assuming initial external assets and liabilities and using the estimated relationships between implicit rates of return on assets and liabilities and aggregate OECD interest rates (equations 4a and 4b).

2. Changes in the balance of investment income multiplying initial implicit rates of return on external assets and liabilities with actual changes in external assets and liabilities over the period 2007-12.

3. Includes interaction term between changes in implicit rates of return (using the estimated relationships between implicit rates of return) and actual changes in external assets and liabilities, as well as changes in the investment income balance not explained by the estimation setup.

Source: OECD Economic Outlook 93 database; and OECD calculations.

Non-quantified factors

36.   To some extent, changes in current accounts not explained by the above factors may reflect structural economic changes, including changes in the financial sector and structural policies, but the estimation setup does not allow for the identification of the impact of these factors on the current account. For instance, over and above the effects via the economic cycle part of the decline in euro area countries' current account deficits may be driven by the drying up of cross-border financing as well as by structural policy reforms implemented in the wake of the crisis (Box 1).[21]

---

21.   Structural policy indicators are generally available at low frequencies and are characterised by discrete jumps rather than continuous changes over time, which precludes their inclusion in the quarterly empirical model.

Box 1. The current account and structural policies

Many structural reforms that reduce domestic distortions can have the added effect of narrowing current account imbalances by influencing private and public saving and investment (see OECD, 2011; 2012a; 2013a). Mainly drawing on the empirical literature, this box briefly outlines current account impacts of structural policy reforms in different areas.

- **Labour market regulation:** Vogel (2011) shows in a general equilibrium framework that labour market reforms, at least in the short term, can increase external competitiveness by fostering wage restraint. Consistent with this theoretical prediction, Kerdrain, Koske and Wanner (2010) show empirically that more stringent employment protection legislation (EPL) tends to reduce current account balances, possibly because domestic firms substitute capital for labour. Ivanova (2012) finds that high minimum wages relative to average wages are associated with lower current account balances.

- **Product market regulation:** the scope for product market deregulation in a number of surplus countries (Germany, Japan) is large, especially in sectors sheltered from trade. Product market deregulation tends to raise investment, at least temporarily (OECD, 2011; Alesina *et al.*, 2005), which would reduce current account surpluses (Kennedy and Slok, 2005).[1]

- **Financial market regulation:** the effect of financial reform conducive to financial development on current account balances is *a priori* ambiguous. On the one hand, financial development may raise saving by widening saving opportunities. On the other hand, it may reduce saving by loosening borrowing constraints. Cheung *et al.* (2010) and Chinn and Ito (2007) show empirically that across countries increases in private credit-to-GDP ratios are associated with significant reductions in current account balances.

- **Tax policy:** tax reforms affect the saving and investment decisions of firms and households. In current account deficit countries where the treatment of interest expenses is particularly generous (taking into account taxation on asset returns such as imputed housing rent), such as in the United States, reducing interest deductions may raise saving and reduce current account deficits.

- **Social spending:** the empirical literature establishes a robust negative link between the ratio of public health spending to GDP and current account balances (Kerdrain, Koske and Wanner, 2010; IMF, 2012). According to the literature on the impact of public health insurance on private saving (Jappelli *et al.*, 2006), this result may be driven by the substitution of public provision of health insurance for private precautionary saving. The magnitude of the estimated link suggests that an increase of 1 percentage point in the ratio of public health spending to GDP is associated with a reduction in the current account balance by between 0.7 and 1% of GDP.

---

1. Vogel (2011) shows in a general equilibrium setup that the effect of product market regulation on current account balances depends on the relative size of competitiveness and income effects. In his setup, lower price-cost margins boost exports, which may temporarily more than offset the increase in imports resulting from higher income.

---

5. The medium-term outlook for global imbalances: variant scenarios

37. This section describes a number of stylised medium-term scenarios for international imbalances over the period 2015-20. All scenarios build on *OECD Economic Outlook* of May 2013 (OECD, 2013b; hereafter EO93) for the period 2013-14. Assumptions underlying the scenarios are described in Box 2 and further technical details can be found in Annex A2.

Box 2. Assumptions underlying the scenario analysis

This box details the assumptions underlying a set of stylised scenarios designed to consider the possible scale of future international imbalances beyond the short-term projections for the period 2013-14 in EO93. Output gaps are assumed to close gradually over the period 2015-20 in all scenarios, with no feedback from assumed fiscal, exchange rate or structural policies to the closing of output gaps. A somewhat artificial scenario assuming minimal policy adjustment beyond 2014 is generated to serve as a baseline, and is then augmented with additional policy assumptions to generate alternative scenarios. One set of scenarios quantifies the scope for a further narrowing of imbalances through policy action, assuming selected structural reforms and action to rectify fiscal imbalances. A second set of scenarios aims at quantifying potential upside risks to global imbalances.

(1) A baseline scenario assumes no further change in fiscal and real exchange rates beyond 2015, so that underlying fiscal balances remain at their 2014 levels. Aggregate OECD short-term interest rates gradually return to neutral levels by 2020, with neutral interest rates in 2020 taken from Johansson *et al.* (2012) and residential investment-to-GDP ratios gradually return to long-term averages. The real oil price (normalised on the US GDP deflator) is assumed to increase moderately by 3% per year, which is consistent with the oil price assumption in EO93 and corresponds to a 20% increase over the period 2015-20.

Scenarios examining the scope for further current account narrowing

(2) A fiscal adjustment scenario builds on the baseline scenario assuming:

- Significantly larger fiscal adjustment after 2014 in zones with larger remaining fiscal imbalances. The United States, the euro area deficit zone and Japan are assumed to undertake ambitious fiscal consolidation (increase in the primary structural fiscal balance of 1% of GDP per year) to put government debt on track towards a debt ratio of 60% of GDP over the long term. The euro area surplus zone and China are assumed to undertake no further fiscal consolidation beyond 2014.

- Real exchange rates in zones with large negative output gaps in 2014 or large fiscal consolidations over the period 2015-20 are assumed to depreciate, whereas they appreciate in the remaining zones. Between 2015 and 2020, real effective exchange rates are assumed to depreciate by 10% in the euro area deficit zone and by 5% in the United States. Real effective exchange rates are assumed to appreciate by 5% in the euro area surplus zone and China and to remain constant in Japan.

(3) A structural reform scenario builds on scenario (2) by additionally assuming a generic package of structural reforms along the lines described in Box 1 (see Annex for more details on the underlying assumptions):

- In the euro area, labour market reforms in deficit countries are assumed to raise competiveness and reduce the current account deficit by around 1% of GDP while product market reforms in surplus countries reduce the surplus by around 1% of GDP.

- In the United States, tax and financial reforms raise private saving by around 0.5% of GDP.

- In Japan, product market reforms are assumed to raise private investment by 0.5% of GDP.

- In China, financial liberalisation and the expansion of the social safety net are assumed to reduce private saving by 1% of GDP.

Scenarios examining upside risks to global imbalances

(4) A higher oil prices scenario builds on the baseline scenario assuming that:

- The real oil price doubles over the period 2015-20, which is similar to the pre-crisis increase in the real oil price between 2002 and 2007.

(5) A housing boom scenario builds on scenario *(4)* assuming that:

- Residential investment-to-GDP ratios return to pre-crisis levels by 2020.

Although the empirical model does not strictly impose global consistency of current account changes, all relevant variables enter the estimated equations and simulations in relative terms, which ensures that, in practice, global discrepancies are small. Changes in the global current account discrepancy -- *i.e.* the sum of current account balances across all zones -- amount to less than 0.2% of global GDP in all scenarios (see Annex A2 for more details on the global consistency in the scenario analysis).

A baseline scenario

38.   A baseline scenario, built on OECD Economic Outlook projections up to 2014 and assuming minimal policy action beyond 2014, suggests a gradual increase in the scale of global imbalances to 2020. Despite output gradually returning to potential, residential investment-to-GDP ratios returning to long-term averages and interest rates returning to neutral levels, the overall scale of global imbalances would remain well below the pre-crisis peak – albeit steadily rising (Figure 8).

39.   In current account deficit zones, the assumptions in the baseline scenario imply a significant increase in deficits over the scenario horizon (Tables 3 and 4). The closing of output gaps and the return of residential investment ratios to historical averages over the scenario horizon raise the deficit by around 1% of GDP in the United States and 3% in the euro area deficit zone (see Table A4). Significant declines in investment income balances (around ½ per cent of GDP) -- which reflect higher net external debt and the normalisation of interest rates -- further reduce current account balances in these zones. In the United States, the closing of the domestic output gap and the higher elasticity of the oil balance to price fluctuations than in other industrialised countries reduce the oil balance by around ½ per cent of GDP, although this does not take into account the recent and prospective rise in domestic energy supply due to increased shale gas and oil extraction over the projection horizon. The rise of the current account surpluses of the euro area surplus zone and China reflect declines in relative output gaps and relative residential investment ratios, as well as the normalisation in interest rates which raises the balance of investment income for net foreign creditors.

Figure 8. Scenarios for global current account imbalances
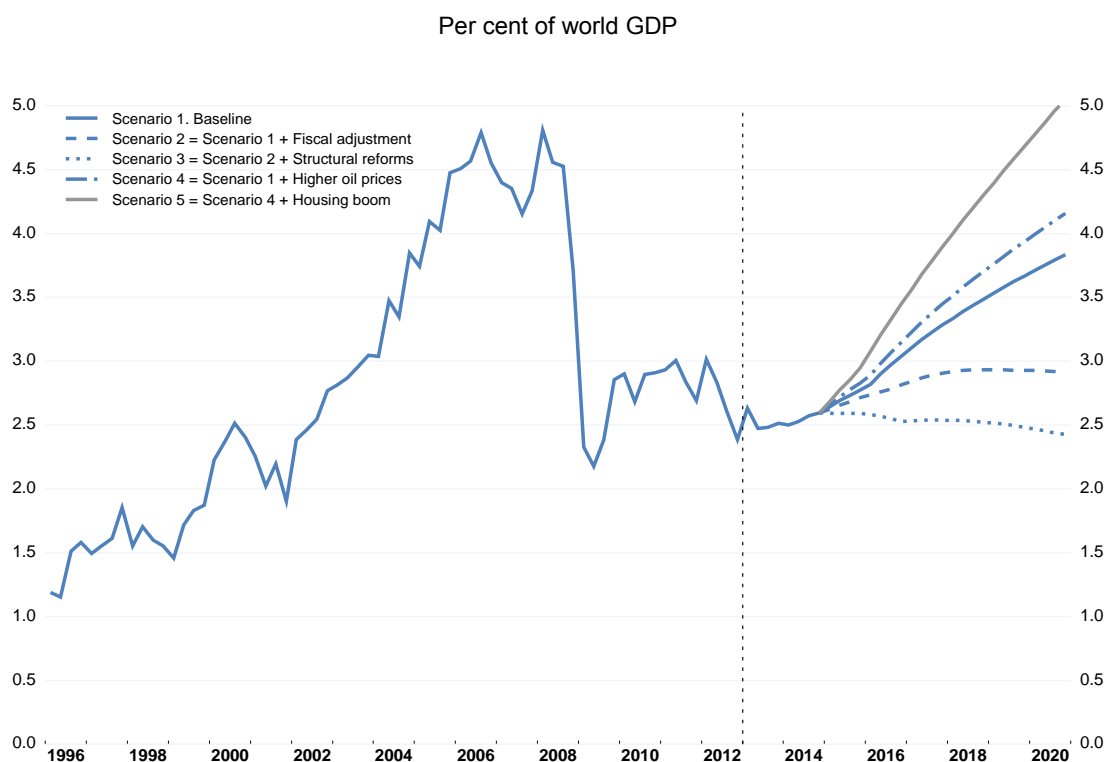
Per cent of world GDP

Note: Calculated as the sum of the absolute values of current account balances in dollars divided by world GDP in dollars.

Source: OECD Economic Outlook 93 long-term database and OECD calculations.

Table 3. Scenarios for current account imbalances

| | Pre-crisis peak[a] | 2014 | 2020 | | | | | |
			Baseline (1)	(1) + Fiscal adjustment (2)	(2) + Structural reforms (3)	(1) + Higher oil prices (4)	(4) + Housing boom (5)	Required for NFA stabilisation[b]
United States	-6.0	-3.3	-5.1	-3.2	-2.5	-5.7	-6.9	-0.6
Euro area deficit[c]	-4.9	0.8	-2.7	-1.0	0.0	-2.8	-4.1	-1.4
Japan	4.8	1.9	2.3	2.8	2.2	2.1	3.0	1.0
Euro area surplus[c]	6.5	5.3	7.0	5.7	4.8	6.9	8.4	0.5
China	10.2	1.4	2.8	1.0	0.3	2.2	3.3	1.9
Oil exporters	16.4	7.2	12.1	11.7	11.7	18.0	19.1	2.1

1. 2006 for the United States and the oil exporters, 2008 for the euro area deficit zone and 2007 for all remaining zones.

2. Current account balances required to stabilise net foreign assets (NFA) at 2011 levels are calculated under stylised assumptions on nominal GDP growth and assuming zero capital gains. They should therefore be seen as being indicative rather than precise benchmarks.

3. The euro area surplus zone is here defined to include euro area members for which the current account surplus was on average larger than 1% of GDP over the period 2000-05 (Austria, Belgium, Germany, Finland, Luxembourg and the Netherlands). The euro area deficit zone includes the remaining members of the OECD euro area.

Source: OECD Economic Outlook 93 long-term database and OECD calculations.

Table 4. Decomposition of current account balances (baseline scenario)

Per cent of GDP

	2014	2020	2020-2014
United States			
Non-oil trade balance	-1.9	-2.8	-1.0
Oil balance	-1.7	-2.1	-0.4
Investment income balance	1.2	0.7	-0.5
Other	-0.8	-0.8	0.0
Euro area deficit			
Non-oil trade balance	3.6	1.1	-2.5
Oil balance	-0.7	-1.0	-0.2
Investment income balance	-1.3	-2.0	-0.7
Other	-0.8	-0.8	0.0
Japan			
Non-oil trade balance	-0.3	-0.1	0.2
Oil balance	-1.0	-1.1	0.0
Investment income balance	3.2	3.5	0.3
Other	0.0	0.0	0.0
Euro area surplus			
Non-oil trade balance	6.2	7.5	1.4
Oil balance	-0.9	-1.0	-0.1
Investment income balance	1.7	2.1	0.5
Other	-1.6	-1.6	0.0
China			
Non-oil trade balance	5.4	6.5	1.1
Oil balance	-3.2	-3.3	-0.1
Investment income balance	-0.8	-0.4	0.4
Other	-0.1	-0.1	0.0
Oil exporters			
Trade balance	10.2	14.0	3.8
Investment income balance	-2.6	-1.5	1.1
Other	-0.4	-0.4	0.0

Source: OECD Economic Outlook 93 long-term database and OECD calculations.

Policy scenarios examining the scope for further narrowing of global imbalances

Further fiscal consolidation and real exchange rate changes

40.   Ambitious fiscal consolidation in the areas with largest remaining fiscal imbalances combined with real exchange rate adjustment, underlying the *fiscal adjustment scenario*, would bring current account deficits much closer to what would be needed to stabilise net foreign assets in the United States and the euro area deficit zone (Table 2, Column marked 2).[22] The stylised scenario suggests that ambitious fiscal consolidation could reduce current account deficits by around 2% of GDP with respect to the baseline, reducing the gap with that needed to stabilise net foreign assets by around 40% in the United States and achieving broad stabilisation in the euro area deficit zone. Through the impact on *relative* structural fiscal balances, ambitious fiscal consolidation in the United States and the euro area deficit zone would also reduce current account surpluses in surplus zones. The stylised fiscal consolidation scenario suggests that, despite the fading of cyclical effects, China's current account surplus could be around 1% of GDP by 2020. In Japan, ambitious fiscal consolidation would raise the current account surplus by around ½ per cent of GDP although large increases in the primary structural fiscal balance are partly offset by large public debt servicing costs over the scenario horizon.

Additional structural reforms

41.   Although aggregate imbalances stabilise in the fiscal consolidation scenario it is not entirely satisfactory in a number of ways. Fiscal consolidation and real exchange rate adjustment over 2015-20 does not bring the current account balance of the United States to sustainable levels. In the euro area deficit zone -- where fiscal consolidation and real exchange rate adjustment would suffice to bring the current account balance to sustainable levels -- aggregation masks important differences in the scale of the adjustments needed to reach sustainable external positions for some individual countries and understates the systemic importance of small countries within the currency union. In Japan, fiscal consolidation required to stabilise public debt will make any reduction in the current account surplus unlikely. Against this background, a package of selected structural reforms could further reduce current account imbalances. (Table 3, Column 3).

42.   While there is less scope for product and labour market reforms in the United States than in most other countries, reducing distortionary tax incentives, such as the mortgage interest deduction, could raise private saving. Reforms in financial market regulation to which the United States has committed in the framework of the G20 may tighten the availability of credit for private consumption (G20, 2012). The contribution to limiting future imbalances from removing distortionary tax incentives and financial reform is difficult to quantify. In the stylised structural reform scenario the combined effect of removing distortionary tax incentives and of financial reform on private saving and the current account balance is assumed to be around ½ per cent of GDP. However, to the extent that financial reform helps to avoid or limit future credit and asset price bubbles, its long-term effect could be more important than in the scenario analysis reported here.

---

22.   The fiscal consolidation assumed here for the United States is more ambitious than the commitments given to the G20 (G20, 2012) which refer to stabilising the (federal) debt-to-GDP ratio by 2015 and reducing the deficit to less than 3% of GDP by FY 2017. It is more difficult to judge the consistency of the fiscal consolidation assumption for the euro area with G20 commitments, although the latter did refer to putting the debt-to-GDP ratio on a declining path after 2013, while pursuing differentiated fiscal consolidation, taking into account country-specific fiscal and macro-financial risks". For Japan the assumed fiscal consolidation path is broadly consistent with the G20 commitment to achieve a primary surplus by FY 2020.

43.   EU/euro area commitments to the G20 to reform product markets and mobilise labour markets may support external rebalancing. In euro area surplus countries, the commitment to further pursue the Single Market in network industries and services, especially professional services and retail distribution, may boost growth in the non-traded sector, thereby reducing current account surpluses. In a number of euro area deficit countries, including Greece, Portugal and Spain, labour markets are relatively inflexible (Venn, 2009). Reforms to enhance labour market flexibility, including by lowering employment protection of permanent workers (OECD, 2013a), may boost productivity and competitiveness in these countries, thereby raising current account balances. For Japan, the scenario analysis suggests that selected growth-enhancing structural reforms could have the side-effect of reducing the current account surplus over the period 2015-20. Easing product market regulation could boost investment and lead to reallocation of resources away from production of tradables. Although G20 commitments include structural reforms to 'create new industries and new markets through innovation in areas such as environment and healthcare' there is no clear commitment to deregulating sheltered sectors.

44.   For China, the structural reform scenario embodies an expansion of social security and the liberalisation of financial markets which may bring the current account surplus to a level consistent with a gently decreasing path of net foreign assets. This represents a remarkable turnaround compared to the peak surplus of 10% of GDP in 2007. It should, however, be seen in the context of particularly large uncertainties surrounding the Chinese output gap and the fact that housing market developments are not explicitly modelled. If the output gap in 2014 is significantly more positive than projected in EO93 -- *e.g.* reflecting a larger decline in the potential growth rate -- or the housing market faces a significant downward correction, the cyclical rebound in the Chinese current account balance could be larger than suggested by the stylised scenarios. Moreover, long-term projections beyond 2020 (OECD, 2012b) suggest a pick-up in the current account surplus after 2020 as the investment rate falls more rapidly than saving, when the potential growth rate slows due to catch-up and demographic change. G20 commitments include promoting "a basically balanced balance of payments account" and increasing the household consumption rate. Expanding public health insurance and liberalising financial markets would be consistent with these objectives as they would increase private consumption by reducing the need for precautionary saving, thereby further reducing the current account surplus (OECD, 2013c).

Scenarios examining upside risks to global imbalances

Higher oil prices

45.   A return of high commodity prices may have a sizable impact on international imbalances. Thus far, the oil price and oil producers' current account surpluses have remained below pre-crisis peaks. The importance of a return of high commodity prices can be assessed by a variant scenario that assumes a doubling of the real oil price over the scenario horizon. Oil producers' current account surpluses would increase above pre-crisis levels while significantly reducing current account balances in the United States and China (in the case of the United States subject to the caveat mentioned above that increased domestic energy supply has likely reduced the impact of oil prices on the external balance). Current account balances in the euro area and Japan would only marginally be affected by higher oil prices as the sensitivity of the oil balance to changes in real oil prices is estimated to be much lower, which may in part reflect the lower oil intensity of production in these zones. Based on oil producers' past saving behaviour, changes in oil balances could offset about half of the projected fiscal and exchange rate effects on global imbalances, raising aggregate global imbalances by around one-fifth. If oil producers started saving a larger fraction of oil revenues for future consumption than in the past, the impact on the level of international imbalances could be even larger.

Housing boom

46.   If, in addition to higher oil prices, residential investment-to-GDP ratios return to pre-crisis levels, global imbalances would return to their pre-crisis peak by 2020. Overall, the simulations suggest that a return of residential investment-to-GDP ratios to pre-crisis levels would raise global imbalances by around 1% of global GDP. Residential investment effects would be particularly pronounced in current account deficit zones, where housing booms of a similar magnitude as before the crisis would raise the current account deficit by around 1% of GDP in the United States and the euro area deficit zone. While a return of residential investment-to-GDP ratios to pre-crisis peaks in the United States and the euro area deficit zone currently appears unlikely, a rebound in capital flows which are currently at depressed levels may well result in renewed asset price distortions that divert resources from the tradable to the non-tradable sectors.

Conclusion

47.   The stylised scenarios in the preceding section illustrate that a combination of ambitious fiscal consolidation in the zones with largest remaining fiscal imbalances in 2014, exchange rate adjustment and selected structural reforms would go a long way in countering the projected cyclical rebound in external imbalances and ensuring external sustainability in the sense of stabilising net external debt. In the absence of such policy changes or if upside risks to global imbalances materialise -- *e.g.* higher oil prices or renewed housing booms driven by a rebound of capital inflows -- global imbalances would rebound, raising the risk of disruptive current account adjustment in the medium term.

BIBLIOGRAPHY

Alesina, A., S. Ardagna, G. Nicoletti, and F. Schiantarelli (2005), "Regulation and Investment", *Journal of the European Economic Association* 3(4): 791-825.

Banerjee, A., J. Dolado and R. Mestre (1998), "Error-Correction Mechanism Tests for Cointegration in a Single-Equation Framework", *Journal of Time Series Analysis* 19(3): 267-283.

Bernanke, B. (2005), "The Global Saving Glut and the US Current Account Deficit", speech delivered at the Sandridge Lecture, Virginia Association of Economists.

Chinn, M. (2012), "The U.S., China and the Rebalancing Debate: The Impact of Academic Research", forthcoming in Y.-W. Cheung and J. de Haan (eds.), *The Evolving Role of China in the Global Economy*, MIT Press.

Chinn, M. and H. Ito (2007), "Current Account Balances, Financial Development and Institutions: Assaying the World 'Saving Glut'", *Journal of International Money and Finance* 26: 546-569.

Fournier, J.-M., I. Koske, I. Wanner and V. Zipperer (2013), "The price of oil -- Will it start rising again", *OECD Economics Department Working Papers* No. 1031.

G20 (2012), "Policy Commitments by G20 Members", Los Cabos Summit, 18-19 June.

IMF (2012), "Pilot External Sector Report", July.

Ivanova, A. (2012), "Current Account Balances: Can Structural Policies Make a Difference?" *IMF Working Paper* WP/12/61.

Jappelli, T. L. Pistaferri and G. Weber (2006), "Health Care Quality, Economic Inequality, and Precautionary Saving", *Health Economics* 16: 327-403.

Kaminsky, G. (2008), "Crises and Sudden Stops: Evidence from International Bond and Syndicated-Loan Markets, *Monetary and Economic Studies* 26: 107-129.

Kennedy M. and T. Sløk (2005), "Are Structural Reforms the Answer to Global Current Account Imbalances?" *OECD Economic Studies* No. 41, 2005/2

Kerdrain, C., I. Koske and I. Wanner (2010), "The Impact of Structural Policies on Saving, Investment and Current Accounts", *OECD Economics Department Working Papers* No. 815.

Lane, P. (2012), "The European Sovereign Debt Crisis", *Journal of Economic Perspectives* 26(3): 49-68.

Obstfeld, M. and K. Rogoff (2010), "Global Imbalances and the Financial Crisis: Products of Common Causes", in R. Glick and M. Spiegel (eds.), *Asia and the Global Financial Crisis*, Federal Reserve Bank of San Francisco.

Obstfeld, M. (2012), "Does the Current Account Still Matter?" *American Economic Review* 102(3): 1–23.

OECD (2011), *Economic Policy Reforms 2011: Going for Growth*, Paris.

OECD (2012a), *Economic Policy Reforms 2012: Going for Growth*, Paris.

OECD (2012b), *Economic Outlook No. 91*, "Medium and long-term scenarios for global growth", Chapter 4, Paris.

OECD (2012c), *Economic Outlook No. 92*, "Policies to Ease Euro Area Rebalancing", Box 1.4., Paris.

OECD (2013a), *Economic Policy Reforms 2013: Going for Growth*, Paris.

OECD (2013b), *Economic Outlook No. 93*, May, Paris.

OECD (2013c), *OECD Economic Survey of China*, Paris.

Venn, D. (2009), "Legislation, Collective Bargaining, and Enforcement: Updating the OECD Employment Protection Indicators", *OECD Social, Employment and Migration Working Papers* No. 89.

Vogel, L. (2011), "Structural Reforms and External Rebalancing in the Euro Area: a Model-based Analysis", *European Commission Economic Paper* No. 443.

ANNEX

A1.   Details on estimation results

48.   The regression analysis for non-oil and oil trade balances is based on a first step, which adjusts headline balances in per cent of GDP for the business cycle, and a second step, which estimates the drivers of cyclically-adjusted current account balances. The entire analysis is conducted zone-by-zone with quarterly data. For most zones the starting date for the estimations is in the early 1990s. The main advantage of the two-step approach is that it attributes variation in current account balances due to the cyclical variation in drivers of current account balances, such as real exchange rates or fiscal balances, fully to output. In a one-step approach, only the variation in current account balances orthogonal to variation in real exchange rates and fiscal balances would be attributed to the output gap, which could potentially result in 'under-adjustment' of headline current account balances.[23] A technical advantage of the two-step approach is that standard unit root tests show that current account balances and output gaps are generally (trend-) stationary, whereas, over the sample period, real exchange rates and (structural) fiscal balances are often integrated of order one. The two-step approach allows estimating simple OLS regressions in levels for the cyclical adjustment in the first step, while the issue of non-stationarity is dealt with by estimating error-correction models in the second step.[24] The results of the estimations for the non-oil and oil trade balances are reported in Tables A1 and A2.[25]

49.   The regression analysis for the investment income balance relates the implicit rate of return on foreign assets and liabilities to the aggregate OECD short-term interest rate. This allows isolating the impact of changes in aggregate OECD interest rates on the investment income balance, with increases in the aggregate OECD short-term interest rates generally raising the balance for net foreign creditors and reducing it for net foreign debtors (Table A3).[26]

---

23.   For instance, in euro area surplus and deficit zones only the variation in output gaps orthogonal to real exchange rate variation would be attributed to the output gap using a one-step approach although part of the real exchange rate depreciation of euro area deficit countries is likely cyclical and may be reversed as output returns to potential.

24.   Error correction mechanism tests of cointegration based on Banerjee *et al.* (1998) reject the null hypothesis of no cointegration in the second-stage equations.

25.   Due to instability of the estimation results for the Chinese non-oil trade balance, separate estimations for exports and imports (normalised on GDP) were conducted that resulted in well-behaved error correction equations. The results reported in Table A1 constrain the (long-term) coefficients of relative output gaps, real effective exchange rates, relative fiscal balances and relative housing gaps to be equal to the difference in coefficients between the export and import equations while leaving all other coefficients unconstrained.

26.   Due to data limitations, for China and oil exporters, equations (4a) and (4b) could not be estimated. A simple regression of the investment income balance on the aggregate OECD short-term interest and the level of net foreign assets results in statistically significant coefficients on short-term interest rates of 0.15 for China and 0.3 for oil exporters.

Table A1. Non-oil trade balance: recession results

	United States		Euro area deficit		Japan		Euro area surplus		China	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
1st stage	*Dependent variable: ratio of non-oil balance to GDP*									
Relative output gap	-0.43***	-13.77	-0.39***	-6.49	-0.1***	-3.60	-0.39***	-5.04	-0.28	c
R^2	0.67		0.30		0.13		0.27		0.44	
2nd stage	*Dependent variable: ratio of cyclically-adjusted non-oil balance to GDP*									
Long-term										
log(REER)	-0.5***	-2.93	-0.55***	-3.41	-0.38*	-1.88	-0.55***	-2.57	-0.58	c
Relative fiscal balance	0.46***	5.40	0.3***	4.99	0.28**	2.29	0.3***	4.03	0.56	c
Relative housing gap	-0.89**	-2.17	-1.24***	-8.61	-0.45*	-1.84	-1.24***	-10.44		
Short-term										
Δlog(REER)	-0.82***	-3.56	-0.51*	-1.83	0.16**	2.36				
Δ relative fiscal balance									-0.3**	-2.55
Δ relative housing gap	0.81**	2.10	-0.86***	-2.68			-0.86**	-2.12		
ECM	-0.36***	-3.33	-0.25***	-2.89	-0.25***	-3.23	-0.25***	-3.52	-0.08*	-1.76
R^2	0.32		0.25		0.41		0.19		0.14	

1.   (***) denotes significance at 1%, (**) at 5% and (*) at 10%.

2.   Sample starts in early 1990s for all countries.

Source: OECD Economic Outlook 92 database and OECD calculations.

Table A2. Oil balance: recession results

	United States		Euro area deficit		Japan		Euro area surplus		China	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
1st stage	*Dependent variable: ratio of oil balance to GDP*									
Domestic output gap	-0.07***	-6.19	-0.03***	-7.71	-0.02***	-4.78	-0.03***	-4.32	-0.10***	-4.32
R^2	0.86		0.89		0.79		0.88		0.88	
2nd stage	*Dependent variable: ratio of cyclically-adjusted oil balance to GDP*									
Long-term										
RPOIL	-1.07***	-33.58	-0.29***	-13.51	-0.34***	-21.97	-0.26***	-8.29	-1.00***	-8.29
Short-term										
ΔRPOIL	-0.48***	-4.17	-0.1***	-2.58	-0.32***	-5.87	-0.15***	-3.08	-0.45***	-1.98
ΔRPOIL(-1)	0.28**	2.57			-0.12*	-1.64				
ECM	-0.32***	-2.70	-0.38***	-3.34	-0.59***	-3.84	-0.34***	-3.33	-0.28***	-2.84
R^2	0.28		0.16		0.37		0.20		0.15	

1.   (***) denotes significance at 1%; (**) at 5%; (*) at 10%; c denotes a constrained coefficient.

2.   Sample starts in early 1990s for all countries.

Source: OECD Economic Outlook 92 database and OECD calculations.

Table A3. Investment income balance: recession results

	United States		Euro area deficit		Japan		Euro area surplus	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
	Dependent variable: implicit rate of return on foreign assets							
OECD short-term interest rate	0.43***	20.20	0.34***	17.50	0.56***	10.82	0.55***	17.22
R^2	0.82		0.86		0.57		0.84	
	Dependent variable: implicit rate of return on foreign liabilities							
OECD short-term interest rate	0.43***	14.52	0.33***	11.81	0.56***	7.69	0.55***	14.94
R^2	0.72		0.77		0.45		0.82	

1.   (***) denotes significance at 1%, (**) at 5% and (*) at 10%.

2.   Sample starts in early 1990s for all countries.

Source: OECD Economic Outlook 92 database and OECD calculations.

A2.   Details on scenario analysis

50.   The scenario analysis uses only the estimated long-run coefficients, ensuring that the profile of current account balances over the period 2015-20 is not driven by short-term dynamics. Simulations start in 2013Q1 but current account levels are adjusted to match EO93 short-term projections in 2014Q4 so that outliers for 2012Q4 are not carried through to 2020.[27] Where deterministic trends are included in the estimations, these are gradually phased out over the scenario horizon so that over 2015-20 the profile of current account balances is mainly driven by the estimated long-run coefficients.

51.   The scenarios are globally consistent in the sense that the sum of current account changes across the modelled trading areas over the scenario horizon is smaller than 0.2% of global GDP, *i.e.* increases in current account balances in some areas are broadly offset by decreases in other areas. In most cases, the fact that explanatory variables are included in relative terms in the econometric model is sufficient to ensure global consistency -- *e.g.* the increase in one country's output gap drives up its own relative output gap while reducing relative output gaps in all other countries. In some cases, however, global consistency is enforced by reallocating changes in the modelled zones' aggregate current account balance to the non-modelled zones. This is notably the case for changes in the modelled zones' aggregate current account surplus due to changes residential investment-to-GDP ratios, which are only available for four zones and which, generally, do not sum to zero. Global consistency is also enforced for current account changes due to changes in oil prices, with changes in the oil exporters' current account balance constrained to sum to the opposite changes in oil importers' aggregate oil balance as this is not generally the case based on the estimated equation for oil exporters.[28]

---

27.   In China, for instance, the current account balance in 2012Q4 was unusually low at 1.7% of GDP but rebounded to 3.1% in 2013Q1.

28 .   Similar adjustments are made for changes in current account balances due to changes in modelled zones' structural fiscal balances and due to changes in modelled zones' structural policy settings, as both policies are not explicitly modelled for the oil exporters' zone.

Modelling of balance of investment income

52.   The modelling of the balance of investment income requires constructing external assets and liabilities over the scenario horizon. In a first step, past relationships between the evolution of net external assets and accumulated current account balances are used to construct *net* external assets. Algebraically, the ratio of net external assets to GDP at the end of period *t* can be expressed as:

$$NFA_t = \frac{NFA_{t-1}}{1+g} + \theta \cdot CA_t,$$ (A1)

where g is the growth rate of nominal GDP and CA_t is the ratio of the current account balance to GDP. Over the long term for most zones in this paper cumulated current account balances track the evolution of net external assets fairly accurately, which is consistent with Obstfeld (2012) and with setting $\theta = 1$ in the scenario analysis. However, over the period 1980-2010, cumulated current balances in the United States and the euro area surplus zone exceed changes in net external assets by a factor of 2½. Therefore, θ is set to 0.4 for these zones in the scenario analysis. In a second step, *gross* external assets and liabilities in period *t* are constructed by attributing one half of current account balances to assets and the other half to liabilities, *e.g.* one-half of the current account surplus increases assets while the other half reduces liabilities. Using the estimated relationships between aggregate OECD interest rates and implicit rates of return on gross external assets and liabilities (equations 4a and 4b), the balance of investment income in period *t+1* can be constructed, which by equation (1) allows to compute net external assets in period *t+1*.

Details on assumptions underlying scenario analysis

53.   The *(1) baseline scenario* assumes that there are no further fiscal and real exchange rate movements beyond 2014: Output gaps are assumed to gradually close over the scenario horizon, implying increases in relative output gaps in the United States and the euro area deficit zone, and declines in the euro area surplus zone, China, Japan and the oil exporter zone.[29] Similarly, residential investment-to-GDP ratios are assumed to gradually return to zone-specific historical averages computed over the period 1980-2000.[30] Real oil prices are assumed to increase 3% per year over the period 2015-20 while aggregate OECD short-term interest rates increase from 1% in 2014 to 4% in 2020, consistent with the neutral rate computed in Johansson *et al.* (2012). The contributions of these assumptions to current account changes over the period 2015-20 are reported in Table A4:

---

29.   No output gap data is available for the oil exporter zone so that its relative output gap is exclusively driven by the weighted output gap in its trading partners.

30.   No residential investment data are available for China and the oil exporter zone. These zones are nonetheless affected by changes in residential investment-to-GDP ratios in trading partners, as excess imports or exports implied by changes in residential investment-to-GDP ratios are allocated to China and the oil exporter zone based on GDP weights.

Table A4. Contributions to current account changes over 2015-20 (baseline scenario)

	United States	Euro area deficit	Japan	Euro area surplus	China	Oil exporters
Non-Oil balance	-1.0	-3.1	0.0	1.5	1.3	
Relative output gap	-0.5	-1.9	0.2	0.7	0.1	
Real effective exchange rate	0.0	0.0	0.0	0.0	0.0	
Relative fiscal balance	0.0	0.0	0.0	0.0	0.0	
Relative housing gap	-0.5	-1.1	-0.1	0.9	0.8	
Trend	-	-	-	-	0.4	
Oil balance[1]	-0.3	-0.2	0.0	-0.1	-0.1	4.4
Output gap[2]	-0.1	-0.2	0.0	0.0	-0.1	1.5
Real oil prices	-0.2	-0.1	-0.1	-0.1	-0.2	2.9
Investment income balance	-0.5	-0.8	0.3	0.5	0.4	1.2
OECD short-term interest rate	-0.4	-0.7	0.2	0.3	0.5	1.0
Net foreign assets	-0.1	-0.1	0.1	0.1	-0.1	0.2

1.   Aggregate trade balance for oil exporters. Oil balance for all remaining zones.

2.   Foreign gap for oil exporters. Domestic output gap for all remaining zones.

Source: OECD Economic Outlook 93 long-term database and OECD calculations.

54.   The *(2) fiscal and exchange rate adjustment scenario* assumes that zones with large fiscal imbalances undertake larger fiscal adjustment. The United States, the euro area deficit zone and Japan are assumed to raise the primary structural fiscal balance by 1% of GDP per year to put government debt on track towards a debt ratio of 60% of GDP over the long term. The euro area surplus zone and China are assumed to undertake no further fiscal consolidation beyond 2014.[31] These assumptions imply increases in the relative structural balance in the United States (3½ per cent of GDP), in the euro area deficit zone (3% of GDP) and Japan (2½ per cent of GDP) while the relative structural fiscal balance declines in the euro area surplus zone (2½ per cent of GDP) and China (3% of GDP).

55.   To allow for some degree of expenditure switching between domestic and external demand, real exchange rates in zones with large negative output gaps in 2014 or large fiscal consolidations over the period 2015-20 are assumed to depreciate, whereas they appreciate in the remaining zones. Between 2015 and 2020, real effective exchange rates are assumed to depreciate by 10% in the euro area deficit zone and by 5% in the United States. Real effective exchange rates are assumed to appreciate by 5% in the euro area surplus zone and China and to remain constant in Japan.

56.   The contributions of the fiscal and real exchange rate assumptions for current account changes over 2015-20 are summarised in Table A5:

---

31.   Simulation of a variant of the OECD long-term model (Johansson *et al*., 2012) in which the increase in the primary fiscal balance is capped at 1% of GDP per year shows that for all zones with large remaining fiscal imbalances in 2014 the cap is binding whereas for the euro area surplus zone simulated fiscal consolidation is close to 0% of GDP per year. Reflecting the unavailability of public debt data for China, assumed fiscal consolidation in China is not based on simulation of the OECD long-term model. The oil exporter zone -- for which no fiscal data is available -- is affected by fiscal adjustment in the remaining zones by reallocating excess imports or exports resulting from fiscal adjustments in the modelled zones to oil exporters based on GDP weights.

Table A5. Contributions to current account changes over 2015-20 (scenario 2)

	United States	Euro area deficit	Japan	Euro area surplus	China	Oil exporters
Non-Oil balance	1.0	-1.6	0.4	0.2	-0.4	
Relative output gap	-0.5	-1.9	0.2	0.7	0.1	
Real effective exchange rate	0.2	0.6	0.0	-0.4	-0.3	
Relative fiscal balance	1.7	1.0	0.4	-1.0	-1.5	
Relative housing gap	-0.5	-1.1	-0.1	0.9	0.8	
Trend					0.4	
Oil balance[1]	-0.3	-0.2	0.0	-0.1	-0.1	3.9
Output gap[2]	-0.1	-0.2	0.0	0.0	-0.1	1.5
Real oil prices	-0.2	-0.1	-0.1	-0.1	-0.2	2.4
Investment income balance	-0.4	-0.6	0.3	0.5	0.3	1.2
OECD short-term interest rate	-0.4	-0.7	0.2	0.3	0.5	1.0
Net foreign assets	0.0	0.0	0.1	0.1	-0.2	0.2

1. Aggregate trade balance for oil exporters. Oil balance for all remaining zones.

2. Foreign gap for oil exporters. Domestic output gap for all remaining zones.

Source: OECD Economic Outlook 93 long-term database and OECD calculations.

57. *(3) Structural reform:* The structural reform scenario can broadly be assimilated to the following generic package of structural reforms. In the euro area deficit zone, labour market reforms are assumed to have an effect on the current account balance similar to a ¾-point reduction in employment protection legislation in Kerdrain, Koske and Wanner (2010). In the United States, financial market reforms and tax reforms are assumed to have an equivalent impact on the current account balance as a 20 percentage point decrease in the private credit-to-GDP ratio estimated in Chinn and Ito (2007). Additionally, China is assumed to reform health insurance Additionally, China is assumed to reform health insurance (1 percentage point increase in public health spending to GDP), with the assumed effect on the current account balance taken from Kerdrain, Koske and Wanner (2010). In the euro are surplus zone and Japan, reforms in the services sector are assumed to reduce the current account balance by raising investment, with the effect consistent with an improvement in the regulation index similar in size to that achieved in the average OECD country over 1998-2008 as estimated in Kerdrain, Koske and Wanner (2010). Technically, the structural reform scenario is implemented by adding terms for the various structural policies (relative to trading partners) to the non-oil trade balance equations, with the assumed coefficients taken from the relevant papers in the literature. As structural policies enter the non-oil trade balance equations in relative terms the overall effect on current account balances is influenced by domestic reforms and reforms abroad.

58. The *(4) housing boom* scenario assumes that housing investment-to-GDP ratios return to pre-crisis peaks by 2020, implying increases for 2015-20 of 2½ per cent of GDP in the United States and in the euro area deficit zone; ½ per cent of GDP in Japan; and no change in the euro area surplus zone. Data on housing investment-to-GDP are not available for China and the oil exporters zone, but these zones are nonetheless affected by housing booms in the United States, the euro area and Japan as excess imports in the modelled zones are assigned to China and oil exporters based on GDP weights, thereby raising their surpluses.

59. The *(5) higher oil price* scenario assumes that the real price doubles over the period 2015-20, which is similar to the pre-crisis increase between 2002 and 2007 and remains below the upper confidence band of the real oil price scenarios developed in Fournier *et al.* (2013).

WORKING PAPERS

The full series of Economics Department Working Papers can be consulted at www.oecd.org/eco/workingpapers/

1061. *Restructuring welfare spending in Slovenia*
(June 2013) by Rafał Kierzenkowski

1060. *The economics of civil justice: new cross-country data and empirics*
(Forthcoming) by G. Palumbo; G. Giupponi; L. Nunziata and J. Mora-Sanguinetti

1059. *Banks' restructuring and smooth deleveraging of the private sector in Slovenia*
(June 2013) by Olena Havrylchyk

1058. *Assessing the efficiency of welfare spending in Slovenia with data envelopment analysis*
(June 2013) by Matevz Hribernik and Rafał Kierzenkowski

1057. *Policy determinants of school outcomes under model uncertainty: evidence from South Africa*
(June 2013) by Thomas Laurent, Fabrice Murtin, Geoff Barnard, Dean Janse van Rensburg,
Vijay Reddy, George Frempong and Lolita Winnaar

1056. *Improving education quality in South Africa*
(June 2013) by Fabrice Murtin

1055. *The 90% public debt threshold: the rise and fall of a stylised fact*
(June 2013) by Balázs Égert

1054. *Challenges to sustain Poland's growth model*
(June 2013) by Balázs Égert and Rafał Kierzenkowski

1053. *Reforming agriculture and promoting Japan's integration in the world economy*
(May 2013) by Randall S. Jones and Shingo Kimura

1052. *Inequality and poverty in the United States: public policies for inclusive growth*
(May 2013) by Oliver Denk, Robert Hagemann, Patrick Lenain and Valentin Somma

1051. *Fiscal federalism and its impact on economic activity, public investment and the performance
of educational systems*
(May 2013) by Hansjörg Blöchliger, Balázs Égert and Kaja Fredriksen

1050. *Restoring Japan's fiscal sustainability*
(May 2013) by Randall S. Jones and Satoshi Urasawa

1049. *Measuring total factor productivity at the firm level using OECD-ORBIS*
(May 2013) by Peter Gal

1048. *A projection method for public health and long-term care expenditures*
by Christine de la Maisonneuve and Joaquim Oliveira Martins (forthcoming)

1047. *R&D, patenting and growth: the role of public policy*
(May 2013) by Ben Westmore

1046.   *Knowledge-based capital, innovation and resource allocation*
        (May 2013) by Dan Andrews and Chiara Criscuolo

1045.   *Reforms for a Cleaner, Healthier Environment in China*
        (April 2013) by Sam Hill

1044.   *Making the tax system less distortive in Switzerland*
        (April 2013) by Andrés Fuentes

1043.   *The determinants of informality in Mexico's states*
        (April 2013) by Sean M. Dougherty and Octavio Escobar

1042.   *Legal reform, contract enforcement and firm size in Mexico*
        (April 2013) by Sean M. Dougherty

1041.   *Improving the economic situation of young people in France*
        (April 2013) by Hervé Boulhol
        Améliorer la situation économique des jeunes en France
        (avril 2013) par Hervé Boulhol

1040.   *Improving employment prospects for young workers in Spain*
        (April 2013) by Anita Wölfl

1039.   *Youth labour market performance in Spain and its determinants - a micro-level perspective*
        (April 2013) by Juan J. Dolado, Marcel Jansen, Florentino Felgueroso, Andres Fuentes and Anita
        Wölfl

1038.   *The efficiency and equity of the tax and transfer system in France*
        (April 2013) by Balázs Égert
        Efficacité et équité du système de prélèvements et de transferts en France
        (avril 2013) par Balázs Égert

1037.   *Income inequality and poverty in Colombia. Part 2. The redistributive impact of taxes and
        transfers*
        (April 2013) by Isabelle Joumard and Juliana Londoño Vélez

1036.   *Income inequality and poverty in Colombia. Part 1. The role of the labour market*
        (April 2013) by Isabelle Joumard and Juliana Londoño Vélez

1035.   *Policy options to durably resolve euro area imbalances*
        (March 2013) by Yvan Guillemette and Dave Turner

1034.   *Labour market, welfare reform and inequality in the United Kingdom*
        (March 2013) by Christophe André, Clara Garcia, Giulia Giupponi and Jon Kristian Pareliussen

1033.   *Work incentives and Universal Credit – reform of the benefit system in the United Kingdom*
        (March 2013) by Jon Kristian Pareliussen