



***CURRENT ACCOUNT IMBALANCES
AND THE ROLE OF THE EXCHANGE
RATE: THE CASE OF US ECONOMY***

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Abstract

The object of this research is to analyse the relationship between current account imbalances and exchange rate. In particular, the aim of this paper is to investigate the case of the US current account deficit.

The origins of the US external deficit – around 6.4% of GDP in 2006- the timing of the adjustment and the policy implications, are all sources of a widespread debate. At the centre of the debate there are two issues the one of the required adjustment in the dollar exchange rates for global rebalancing and/or the one of the likelihood of currency crisis occurrence in the US.

In this research we start from the assumption that sooner or later the US imbalances have to be corrected. We perform some simulation exercises trying to evaluate what is going to be the different effectiveness of the adjustment mechanisms and what is going to be the impact of such an adjustment on the main countries.

According to our simulations the correction of the US current account deficit through a depreciation of the nominal dollar exchange rate of the 10% would not be of great entity, in spite of a “second round effect” due to the increase of the fed funds rate to contain inflation. The cost of the adjustment would be paid mainly by China. In fact, because of the high percentage of exports as GDP components, the Chinese economy would be penalised by the loss of competitiveness due to the depreciation of the dollar exchange rate. The effects on euro area GDP, under the assumption of a BCE reaction to the euro appreciation, would be lower but not to neglect.

A fiscal policy adjustment process would improve the federal government account but the effect on the current account deficit would be lesser than the one obtained through the exchange rate adjustment and more costly for US. However the adjustment cost for the other industrialised countries would be very low.

Keywords: Exchange rates, US Dollar, current account, net international investment position
JEL codes.: F02, F21, F43, O11

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“Even where a genuine harm is dealt out by the roulette wheel of evolving comparative advantage in a world of free trade, what a democracy tries to do in self defense may often amount to gratuitously shooting itself in the foot.”

(Samuelson 2005)

Introduction

The object of this research is to analyse the relationship between current account imbalances and exchange rate. In particular, the aim of this paper is, after a review of the recent theoretical and empirical literature, to investigate the case of US current account deficit.

Tab 1 Representative sample of opinions on US current account deficit

Lawrence Summers (2004a)	<i>“The most serious problem we have faced in the last fifty years is that of low national saving, resulting dependence on foreign capital, and fiscal sustainability. ... The current account deficit has widened sharply over the last four years ... to an unprecedented rate of 5% of net national product. More than 100% of the deterioration of the current account deficit is accounted for by a drop in national saving. ... The clear change in national saving ... comes from the increase in the federal budget deficit, which accounts for the fact that the US now has the lowest rate of national saving in its history.”</i>
Nouriel Roubini and Brad Setser (2004)	<i>“[We examine] ... US external deficits and the ... international monetary system that is integral to their financing -a system whose stability hinges on the willingness of Asian central banks to hold enormous amounts of US Treasuries. ... Our analysis suggests that the ... system is fragile, and likely will prove unstable. Even if the United States continues to be able to borrow on terms that other, comparable, debtors could not imagine, our analysis suggests that the US is on an unsustainable and dangerous path. ... The deficits since 2000 reflect the need for a low savings country to ... finance large budget deficits.”</i>
Maurice Obstfeld and Kenneth Rogoff (2005)	<i>“The speed at which the US current account ultimately returns to balance, the triggers that drive that adjustment, and the way in which the burden of adjustment is allocated across Europe and Asia all have enormous implications for global exchange rates. Each scenario for returning to balance poses, in turn, its own risks to financial markets and to general economic stability. ... In our view, any sober policymaker or financial market analyst ought to regard the US current account deficit as a sword of Damocles hanging over the global economy. ... [In] our baseline simulation, in which [all] current account balances go to zero, the dollar needs to depreciate in real effective terms by 33%.”</i>
Olivier Blanchard (2004)	<i>“The dollar needs to depreciate.”</i>
Joseph Stiglitz (2004)	<i>“America's huge fiscal and trade deficits ... jeopardise future American generations' well-being. As ... Herb Stein put it: 'If something can't go on forever, it won't.' But no one knows how, or when, it will all end. ... An even weaker dollar is a strong possibility.”</i>

The origins of the US external deficit - over 6% of GDP, in 2006- the timing of the adjustment and the policy implications, are all sources of a widespread debate. At the centre of the debate there are two issues the one of the required adjustment in the dollar exchange rates for global rebalancing and/or the one of the likelihood of currency crisis occurrence in US.

In spite of very different position on these issues what emerges in the economic debate is that sooner or later there must be a reversal (tab1). The issue that this research intends to investigate is whether this reversal will be costly and what repercussions it could have on the global economy

The research is divided as follows: in the first and second part a survey of the recent literature and a critical review of the stylised facts are presented. The third part of the research provides a simulation of the effects of a reduction in US current account deficit on the main international macro variables by using the Oxford Economic Global Macro model.

I. A survey of the recent literature

Global imbalances have stimulated increasingly greater attention among economists and policy makers worldwide. In the recent years there has been a widespread empirical and theoretical literature. Questions discussed in the literature are: What is a sustainable ratio of external debt? What are the consequences of an "excessive" or "unsustainable" debt? How should sustainability be achieved? By how much does the dollar need to decline in order to achieve a sustainable current account position for the US and rest of world?

In this research, we intend to review the very recent empirical literature on this issue. Most of the recent papers focuses on the case of US current account deficits which now absorbs about three-fourths of available world surpluses. There is still little consensus on either how long current imbalances may be sustained or the channels through which adjustment could take place, and in particular on the role of exchange rates in the unwinding of the imbalances.

To give a general description of the existing literature we briefly recall in tab 2 a selection of recent papers organised according to the different explanation they provide for the current account imbalances. A brief description of the main transmission channels and causes of current account deficit follows.

i) **Current account imbalances and the “twin deficits”**. The presence in the American Administration of a public deficit starting from 2001 next to low private

saving rate increased the needs for external resources. This hypothesis underlines the fact that, according to national accounts, the current account balance (EXP-IMP) is equal to saving ($S = S_p + S_g$) minus investment (I). Therefore any expansion of the fiscal deficit (G-T) that lowers public saving (S_g), being equal the other variables, should cause a worsening of the current account balance¹.

ii) Current account imbalances and low saving rate: Since the mid-1990s, in USA the private saving rate has decreased from about 5% of disposable income to below 2%. The decrease in private saving should partly explain the widening of the current account deficit. However, it is not yet clear whether the decline in saving is autonomous² or the endogenous response to other factors (for the transmission mechanism see the point i))

Tab. 2 Current account deficit determinants

Current account imbalances determinants	Authors
Current account imbalances and the “twin deficits” hypothesis	Cline, (2005) Chinn, (2005) Chinn and Ito, (2005)
Current account imbalances and low saving rate	Blanchard O. and F. Giavazzi (2005) Obstfeld, M., and K. Rogoff, (2005 a) Obstfeld, M., and K. Rogoff, (2005 b) Edwards S. (2005) Nouriel Roubini and Brad Setser (2004)
Current account imbalances: the Bretton Woods II	Nouriel Roubini and Brad Setser (2005) Eichengreen (2004) Dooley, Folkerts-Landau, and Garber, (2003) and (2004) Mann, (2004) Oldani and Savona (2007) Maccario A., Savona P. et al. (2006)
Current account imbalances and Expanding global financial intermediation.	Blanchard and Giavazzi, (2002), Gruber, (2004) Ahearne et. al., (2004) Greenspan (2003) Blanchard, Giavazzi, and Sa (2005) Edwards (2005)
Current account imbalances and Global savings glut/emerging market financial crises.	Bernanke (2005) Kamin (2005)
Current account imbalances and the dark matter	Hausmann and Sturzenegger (2005) Gourinchas, P. O, and H. Rey, (2005) Lane milesi ferretti (2005)
Current account imbalances and capital control	Dornbusch, Goldfajn and Valdés (1995) Bhagwati (1998,) Stiglitz (2002)

1 $(S_p + S_g) - I = (G - T) + (EXP - IMP)$. In the more sophisticated version of the hypothesis, which takes into account the endogeneity of private saving and investment decisions, fiscal expansion boosts domestic spending, pushing up domestic interest rates relative to foreign rates; this attracts foreign investors and buoys the dollar, thereby widening the current account deficit

2 Perhaps reflecting financial innovations that have made it easier for Americans to borrow.

iii) Current account imbalances and U.S. productivity surge The growth rate of U.S. labour productivity rose from some 1.5% yearly in the 1975-95 period to about 3% afterwards. This surge in productivity likely boosted perceived rates of return on U.S. assets, generating capital inflows. Expectations of higher rates of return likely also determined higher domestic investment, and consumption could have been supported by increases in stock prices and expected long-run income.

iv) Current account imbalances and the revived Bretton Woods³ An other explanation for the U.S. current account deficits is that some of US trading partners (mainly Asian) have been intervening to keep their currencies competitive and promote their own growth. To get the necessary reserves in dollar for fulfilling this goal they buy massively US assets. Mann cites the 1990s financial crises as a key factor in the exchange rate policies of the developing Asian economies, suggesting that in the future those policies may change. Dooley, Folkerts-Landau, and Garber argue that intervention to keep exchange rates competitive and produce current account surpluses is in the interest of all developing countries, with the implication that such surpluses and the corresponding US deficit will last at least in the medium term⁴.

v) Current account imbalances and expanding global financial intermediation. Recently, the so-called Feldstein-Horioka paradox⁵—has declined, suggesting that savings are being used to finance investment to a greater extent than in the past (Blanchard and Giavazzi, 2002, and Gruber, 2004). Additionally, there is considerable evidence that the extent of home bias in portfolio allocation⁶ is declining⁷. Greenspan (2003) has suggested that these trends signal improvements in international financial intermediation which allow larger external imbalances to be financed than in the past, an observation that is consistent with recent increases in the absolute value of global current account deficits. Analyses by Blanchard, Giavazzi, and Sa (2005) and Edwards (2005) also accord a role to reduced home bias in the widening of U.S. deficits⁸.

3 The “revived Bretton Woods system” (Dooley, Folkerts-Landau, and Garber, 2003 and 2004) or “co-dependency” (Mann, 2004),

4 They do not explain why the developing countries waited until 1999 to adopt such a strategy.

5 If financial markets are completely integrated, savings will be pooled in the world as a whole. As a result, theoretically, we can assume that an exogenous marginal increase in domestic savings will be invested in a country that offers the highest return. Therefore, there should be no correlation between domestic savings and domestic investments. However, past empirical studies found a high correlation between domestic savings and investment ratios, which seems inconsistent with the assumption of financial integration. In other words, the series of studies about the Feldstein-Horioka paradox suggest a strong tendency for savings to be absorbed domestically.

6 The home bias effect is the tendency for portfolios to be overweight domestic assets.

7 Ahearne et. al., 2004.

8 However, the increased ability of the international financial system to move capital across borders does not, by itself, mean that it is the United States that would be expected to exploit that improved ability. Observers point to various strengths of the U.S. economy—its favourable investment climate, protections of investor rights, and solid rates of return—as making it likely that the United States would attract international capital once it became available.

vi) Current account imbalances and global savings glut/emerging market financial crises. Bernanke (2005), as formerly during the 70's suggested by Duesenberg, Depres and Salant, argues that the large U.S. current account deficit owes importantly to a surge in the availability of saving from overseas. He notes that much of the increased flow of foreign saving has come from developing countries, a development he attributes in large part to the series of financial crises experienced in the past decade. Emerging market financial crises may generate current account surpluses (or lower deficits) through several channels: the economy may lose access to foreign credit; financial intermediation within the economy may become obstructed, causing a credit crunch; balance sheet problems among firms and consumers may restrain domestic spending; and authorities may respond to the weakness in domestic demand by taking actions to keep the exchange rate competitive so as to maintain external demand. As discussed in Kamin (2005) all of those factors were involved in the Asian developing countries' swing into surplus: investment rates collapsed, along with bank lending, while exchange rates remained weak against the dollar, even as the currencies of foreign industrial economies were appreciating⁹.

v) **Current account imbalances and the “dark matter”.** The name is taken from a term used in physics to account for the fact that the world is more stable than you would think if it were held together only by the gravity emanating from visible matter. Hausmann and Sturzenegger (2005) argue that the reported \$2.5 trillion U.S. net international liability position is a statistical mirage. Their analysis is based on the observation that U.S. net income on its international portfolio remains positive. In fact, the U.S. income balance in 2004, at \$36 billion, was slightly above the average for the period since 1990—this despite a 15-fold increase reported net liabilities. The authors' argument in a nutshell: Positive net income receipts should, properly measured, correspond to a positive net international investment position. What's been improperly measured, is the value of U.S. FDI assets abroad. U.S. companies have long reported substantially higher profits on their foreign operations than have foreign companies operating in the U.S. If the value of U.S. FDI assets were calculated by capitalizing the value of the profit streams they generate, the argument goes, the U.S. net liability position would disappear. The authors trace the missing FDI assets to exports of "dark matter": U.S. know-how, brand recognition and expertise that boost the FDI profit stream but, we are told, are not captured in the official estimates of FDI asset values.

vi) Current account imbalances and capital control Since the currency crises of the 1990s economists have had a renewed interest in understanding the behaviour of international capital flows. According to some authors, high capital mobility results in increased macroeconomic instability and, in particular, in more volatile exchange rates and domestic interest rates (Bhagwati 1998, Stiglitz 2002). It has also been argued that in a world of high capital mobility “sudden stops” of capital inflows can

⁹As in the previous explanation the increased flows of capital from developing countries cannot, by themselves, explain the rise in the U.S. current account deficit—in principle, other industrial economies might also have increased their net imports of capital. To explain the rise in U.S. deficits, one must suggest why investors found the United States to be a particularly attractive target for their funds.

be highly disruptive, especially in the emerging countries. According to this view, sudden stops will result in major current account adjustment and in significant declines in economic growth (Dornbusch, Goldfajn and Valdés 1995).

II The case of the US current account deficit

II.1 The stylised facts

In USA, starting from the 90's the current account deficit has been increasing progressively. It approached in 2006 over the 6% of GDP. Currently, there are some important stylized facts concerning the global imbalances.

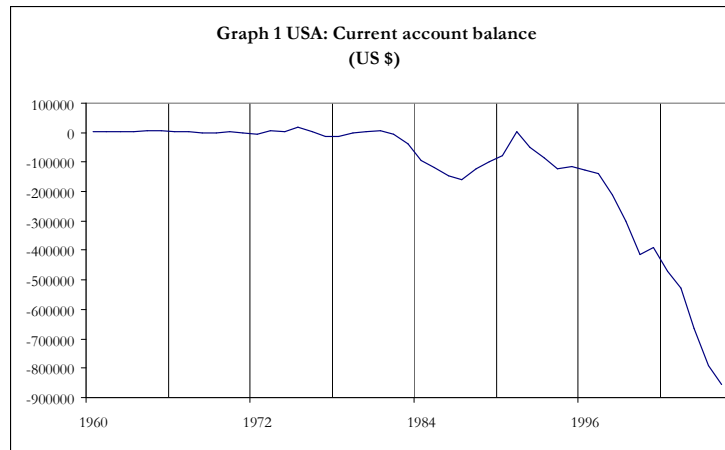
Tab. 3 Global current account 2004, \$ billions

	Current account	% GDP	Reserve increase	Net capital flows
Deficit countries/regions	-696.1	n.a.	n.a.	n.a.
Usa	-660	5.7	n.a.	2,449
Australia	-32	6.4	n.a.	n.a.
UK	-43.3	2.0	n.a.	n.a.
Eastern Europe	-44.2	n.a.	9.4	53.6
Asia	313.2	n.a.	535.6	222.4
Japan	159.4	3.7	176.7	17.3
NICs	85	2.9	96.7	11.7
Asian 4*	61	n.a.	230.6	169.6
o/ w China	38.5	4.2	202.7	163.6
Oil exporters	194.9	n.a.	73.2	-121.7
Middle est	128.5	12.4	45.4	-83.1
Cis	66.4		27.8	-38.6
o/w Russia	61.6	10.3	43.8	-17.8
Canada	28.2	n.a.	n.a.	n.a.
Europe	84.7	n.a.	n.a.	n.a.
o/w eurozone	72.2	n.a.	n.a.	n.a.
Africa	2.8	n.a.	22.9	20.1
Latin America	9	n.a.	12.7	3.7
USA as % of the World	84.2	n.a.	n.a.	n.a.

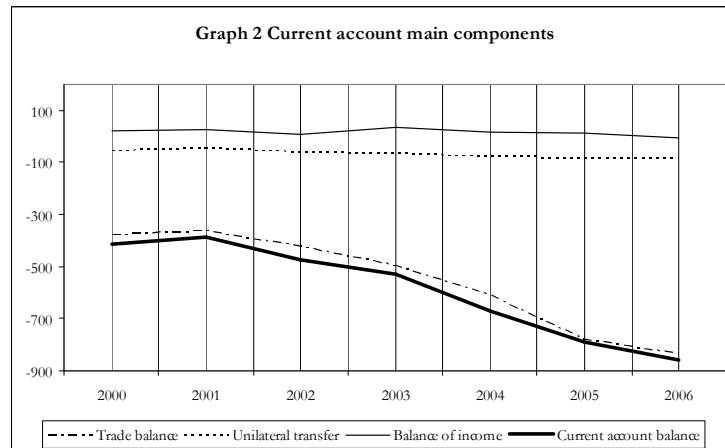
Source: IMF, Roubini, Setser (2005), *China Thailand Malaysia e Philippine

The USA accounts for the 84% of the world total global imbalances; Asia received \$222 billion in net capital inflows from the rest of the world, allowing it to accumulate over \$535.6 billion in reserves being its own current account surplus only \$313.2 billion; oil exporters' account for more of the global current account surplus than Europe (tab.3).

The twin deficits in USA. The current account deficit is the result of the interaction among many factors (i.e. saving, private investments, GDP growth, external demand, capital flows, exchange rate and national and international economic policy). As shown in the chart 2 the current account deficit in USA is mainly due to the trade balance deficit.



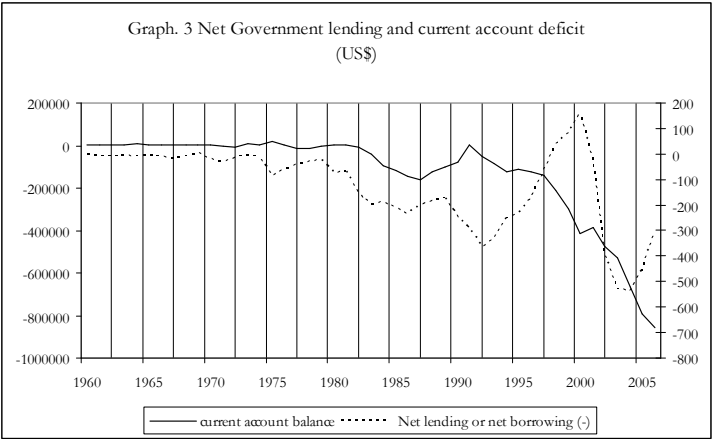
Source: Datastream



Source: Datastream

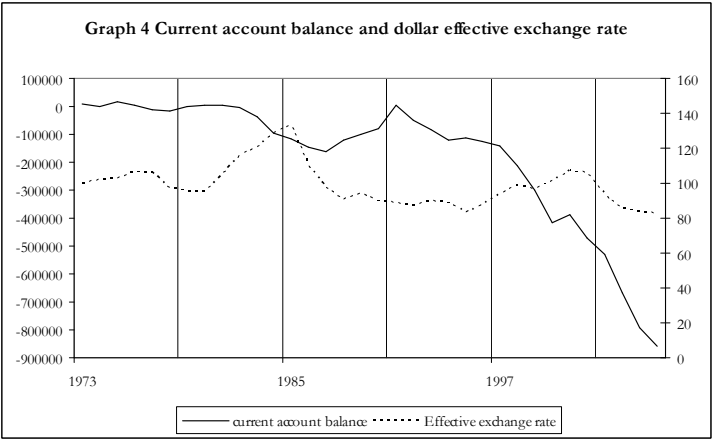
One important point that emerges from the US figures is the insufficiency of the national saving -composed by the public saving (S_g) and the private saving (S_p)- in financing the national private investments. This imbalances determines capital inflows from the rest of the world for an amount equal to the trade balance deficit.

As for the public saving it is worth to underline that the Federal Budget that during the second Clinton Administration reached a surplus of 2,4% of GDP (for the first time after the 70s), starting from 2001, deteriorated.



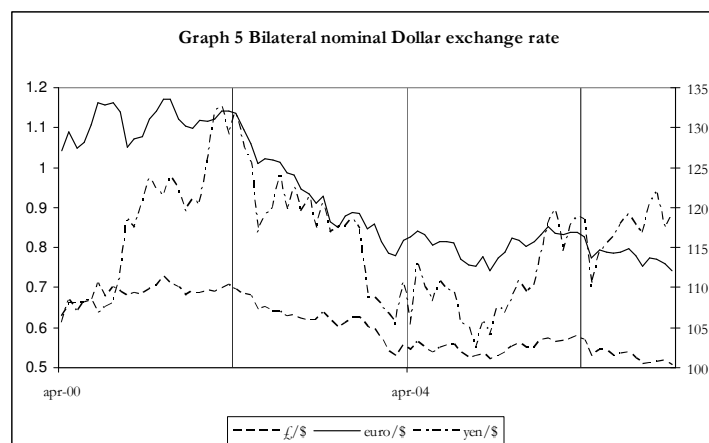
Source: Bureau of Economic Analysis

The presence in the US Administration of a public deficit, next to low private saving rate, increased further the needs for external resources. Furthermore while in the 90s the foreign capital inflows financed mainly the private investments in the 2000's the foreign capital had increasingly financed the public deficit. This phenomenon could be interpreted as a crowding out of foreign resources from a productive sector (private investments) towards a less productive sector (public expenditure).



Source: Datastream

Starting from 2002 next to the worsening of public and current account deficit there has been also a depreciation of the dollar exchange rate with respect to the main international currencies. This tendency has been more relevant with respect to euro and British pound since the BCE and the BOE till now have not intervened on the foreign exchange market.



Source: datastream

Net International Investment Position In USA the *Net International Investment Position (NIIP)*¹⁰ was \$2.7 trillion at the end of 2005. This figure is going to rise as long as the US maintains an imbalance in trade. It should be noted that the external debt is an accounting entry that largely represents US domestic assets purchased with trade dollars and owned overseas, largely by US trading partners.

The rapid increase in the United States' net foreign liabilities has raised questions about foreign investors' willingness to continue to hold or acquire U.S. assets. Federal Reserve Board officials, among others, have noted that the decline in the U.S. NIIP is not sustainable over a longer time period.

Tab 4 The Net International Investment Position

(billions of \$, at market value)

	2003	2004	2005
Net position	-2,340	-2,449	-2,546
US owned assets abroad	8,318	10,075	11,079
Foreign owned assets in USA	10,658	12,524	13,625

Source: Bureau of Economic Analysis (BEA)

¹⁰ The international investment position (IIP) is the balance sheet of a country's external assets and liabilities. It can be used to measure the degree of financial openness of a country and to provide indications on the sustainability of its external debt. As such, it is a helpful tool for monitoring financial stability.

.This view is partly related to concerns that global investment portfolios may by now contain excessive holdings of U.S. assets and that the financing of the current account deficit has recently shifted from equity to debt instruments. Both trends are seen as potential triggers of a disorderly exchange rate adjustment that could have harmful effects on financial markets and real economy.

Some authors have recently underlined as an additional channel through which exchange rates contribute to the external adjustment, i.e. the valuation effects (or financial adjustment channel). This channel highlights that since the foreign international investment position includes many currencies, a depreciation will have valuation effects, resulting in wealth transfers across countries¹¹.

II.2 The theoretical aspects

In this paragraph we briefly present the dynamic equation (1.1) for the ratio of the external debt/GDP denoted by $h_t = L_t/y_t$, where L_t is the external debt and y_t is the GDP. The trade balance/GDP is B , the interest rate is r , the growth rate of GDP is g and $A_t = r h_t - B_t$ is the current account deficit/GDP.

The change in the debt ratio dh_t/dt is equal to A_t the current account deficit/GDP less the product $g h_t$ of the growth rate g and the ratio of external debt/GDP. The current account deficit is equal to the net income payments abroad $r h_t$ less the B_t ratio of the trade balance/GDP. If the current account deficit/GDP is constant at A , and the growth rate is constant at $g > 0$, debt ratio converges to h_e in equation (1.2).

$$(1.1) \quad dh_t/dt = A_t - g h_t$$

$$(1.2) \quad h_e = A/g$$

It is important to know how high the debt ratio $h_t = (L_t/Y_t)$ of the US will go.

¹¹ It is interesting to notice that the US debt structure has exactly the opposite composition in term of currency with respect to a standard composition of an international debtor. Therefore the latter usually has liabilities denominated in foreign currency and a depreciation in national currency would worsen the economic condition. On the contrary a depreciation of the dollar would increase the returns of asset denominated in foreign currency. Gourinchas and Rey (2005b) provide a description of the foreign investment position of the US, reporting yields across different types of assets and liabilities, identifying the impact of a depreciation of the dollar on different yields, and discussing the channels through which the exchange rate facilitates the adjustment.

Empirical researchers start with equation (2), which is equation (1) where the current account deficit A_t is equal to the transfer payments on the debt $r b_t$ less the trade balance B_t . The debt and trade balance are measured as fractions of GDP, and the transfer payments include interest and dividends.

$$(2) \quad db_t/dt = (r_t - g)b_t - B_t$$

From an initial debt ratio is $h(0)$, solve a discrete time version of equation (2) for the debt/GDP ratio at some later date $T > 0$, denoted $h_T = (L/Y)T$. This is equation (3). The trade balance/GDP at time s is B_s and α is 1 plus the interest rate r less the growth rate g . It is generally assumed that α is constant.

The summation of the trade balances is from time $s = 0$ to $s = T-1$.

$$(3) \quad b_T = b(0)\alpha^T - \sum B_s \alpha^{(T-s)}, \quad T-1 > s > 0. \quad \alpha = 1 + r - g$$

The US has been running trade deficits/GDP for some time, $B_s < 0$. The trade balance is saving less investment equal to GDP less absorption. If the interest rate exceeds the growth rate, $\alpha > 1$ and trade deficits continue, the debt ratio will diverge. Then both the borrower's and the lender's constraints will be violated.

The literature concerning the sustainability of the US deficits and debt can be summarized as follows. The analytic framework is equations (1)-(3). Economists wonder what will be the path of the debt ratio. At what arbitrary date $T > 0$, the debt will be repaid.

This question cannot be answered objectively, because no one can know the future course of trade balances, equal to saving less investment or GDP less absorption, interest rates and growth rates. There are too many factors, such as US government budget deficits and growth, developments in the Euro area, China and the rest of Asia.

Empirical researchers are forced to make recourse to simulation or alternative scenarios, based upon equation (3). The trade balance B_s at time s is assumed to depend upon a vector Z_s of variables such as the US and foreign GDP, the nominal exchange rate and a relative price index. Thus $B_s = B(Z_s)$ is the hypothesized trade balance in equation (3). Arbitrary projections are made for the exchange rate, income and price variables. On that basis of these possible scenarios, alternative projections of the external debt ratio/equation (3) and current account deficit A_t in equation (1.1) are obtained.

III Current account deficit reversals: Do real exchange rate matters?

III.1 Some preliminary considerations

The debate on current account deficit in US¹² focuses mainly on the required adjustment in the exchange rates for global rebalancing. In literature there are two main lines of thinking about this issue: a benign view and a pessimistic view.

According to the benign view, the adjustment will occur with minor changes in exchange rates and no turmoil in the world economy. According to the pessimistic view there is some concern that being necessary a sharp exchange rate correction for global rebalancing (i.e. since the external deficit depends on the relative price of local and foreign goods and services, the reversal will require a decline in the real value of the dollar). it will cause great turbulence in the world economy¹³.

The lesson from cross-country experience is that movements of real exchange rates can play an important supportive role in facilitating the smooth unwinding of external imbalances. Real depreciation helps contain the costs in terms of slower GDP growth that are associated with large reversals of current account deficits. Fiscal consolidation and a significant increase in national savings are also typical of episodes where adjustment has been achieved without serious damage in terms of growth. The likelihood of such a benign adjustment decreases with the size of the external deficit and increases with the degree to which a country is open to trade. However there are several reasons that could justify the persistence of US imbalances at least in the short-medium period

i) **The historical experience.** The chart 4 shows how in 1985, when there were the Plaza Agreements in spite of a sharp depreciation of the dollar exchange rate the current account balance worsened further. Also between the 1995 and the 2001, there was a sharp depreciation of the dollar consistent with a worsening of the current account balance. One of the main cause of this low reactivity of the current account to the exchange rate movements was the low elasticity of both exports and imports to the exchange rate. Therefore to make an exchange rate depreciation effective, two conditions should arise: i) the not US firms should increase their prices in dollar terms to compensate the loss in currency terms ii) the US firms should let their price fixed (no pass-through) to increase their market share abroad and to shift the demand for import towards demand for domestic goods.

These conditions did not arise in the past. The firms exporting in US when the Dollar exchange rate depreciated did not increase their price in dollar terms to keep their market share (even reducing in some cases their profits)

¹² The current account deficit is the sum of the trade balance, the balance on investment income, the balance on labour income and unilateral transfers (foreign aid and remittances).

¹³ Roubini (2004)

2. **The US demographic trends.** The US is the only industrialised country with an high population growth rate and a low ageing rate. This phenomenon implies that the percentage of population more dynamic is the one with the highest marginal consumption expenditure.

3. **The technology.** The technological evolution of the nineties lead in US to an increase in productivity higher than in the other industrialised countries. This surge in productivity likely boosted perceived rates of return on U.S. assets, generating capital inflows. Expectations of higher rates of return likely also determined higher domestic investment, and consumption

4. **The trade deficit is partly structural.** The conventional wisdom for the United States is that large exchange rate changes are needed because of the low price elasticity of trade volumes and the partial response of trade prices to changes in nominal exchange rates. Furthermore, the elasticity of import to income in US is very high and in particular is higher than the one of export to international demand. moreover, the development of the international co-operation and of the outsourcing increased dramatically the imports elasticity to income since some goods are not anymore produced in the US

III.2 An overview of deficit reversals episodes in advanced economies

In this paragraph, we summarize the results of a very recent IMF research on a the common features of 42 episodes of large and sustained external deficit reversals over the past 40 years in advanced economies (WEO spring 2007)¹⁴

The IMF study pointed out that all the episodes of current account deficit reversal had some common characteristics (tab5):

Tab.5 Summary statistics of episodes of current account deficit reversals

	N.	Curr acc at year of reversal (%GDP)	Size of adj. (%GDP)	GDP growth		
				Duration of reversal (years)	Average change (%)	REER (total change %)
Advanced economies	42	-4.1	5.7	4.6	-1.4	-12.2
Preceded by large and persistent deficits	7	-6.9	7.4	5	-0.2	-10.2

Source: IMF 2007

¹⁴“ The magnitude of the reversals ranges from the 2.7% of GDP adjustment in Italy beginning in 1981 to the 18% of GDP adjustment that began in Portugal in the same year. Moreover, 13 cases of large and persistent deficits were identified, including the most recent U.S. episode and Australia’s two-decade-long period of current account deficit starting in 1980.” (WEO spring 2007)

- i) The current account deficit averaged 4 percent of GDP at the start of the adjustment, with an average correction of about 6 percent of GDP over a period of four to five years;
- ii) The process of current account adjustment was accompanied by both a real depreciation of the domestic currency (an average 12 percent total real depreciation) and a slowdown of growth (an average 1½ percentage point decline in annual average GDP growth after the reversal compared with before the reversal).
- iii) Deficit reversals tended to be preceded by a positive output gap, with the difference between actual and potential output peaking one year before the start of the adjustment and declining considerably afterward.
- iv) The magnitude of the exchange rate correction and of the GDP growth slowdown varies considerably across episodes.

The main conclusions from this analysis of deficit reversals in advanced economies are that while changes in growth differentials clearly play a role in the adjustment, real depreciation can help smooth the impact of slowing domestic demand. Therefore, among historical episodes of deficit reversals in advanced economies over the past 40 years, there has been a clear trade-off between the growth slowdown after the reversal and total real effective exchange rate depreciation.

However it is important to note that most comparisons to historical experience abroad are limited by the fact that the United States economy is so much larger than those of other countries. As a result, economic development in the United States has ramifications for the world economy that could have feedback effects for the U.S. economy.

Another difference is the role that the dollar plays as the world's "reserve currency." Because the dollar is the world's preferred currency for a store of value, medium of exchange, and unit of account, holders may be less willing to abandon it than they would any other currency. If so, the U.S. may be able to run higher sustainable CA deficits than other countries. In the developing world, a large CA deficit has often been a leading indicator of financial and currency crisis. This was the case in many recent crises, including Mexico, East Asia, Turkey, Brazil, and Argentina. The applicability of these experiences to the United States may be limited, however, because the United States has a flexible exchange rate regime, is seen as a "safe haven" for investment, and, unlike developing countries, is able to borrow in its own currency (i.e. depreciation reduces rather than increases the burden of servicing its debt).

The current account adjustment mechanisms. It is possible to identify two transmission mechanisms, (that however have mutual interaction effects) through which a current account deficit reversal could arise in US.. The first pass through a further dollar exchange rate depreciation, a revaluation of the yuan and a re-

weighting of the international reserves. The second mechanism passes through a restrictive stance of the economic policy and a deceleration of GDP growth.

i) **The exchange rate mechanism.** The current account deteriorated further also during the depreciation of the dollar exchange rate. As already noticed it is due to the low elasticity of US imports and exports to the exchange rate movements. Therefore to make an exchange rate depreciation effective, two conditions should arise: i) the US firms should increase their prices in dollar terms to compensate the loss in currency terms ii) the US firms should let their price fixed (no pass-through) to increase their market share abroad and to shift the demand for imports towards demand for domestic goods.

These conditions did not arise in the past. The firms exporting in US when the Dollar exchange rate depreciated did not increase their price in dollar terms to keep their market share (even reducing in some cases their profits). Thus the exchange rate channel seems to be able to only partially help in determining a deficit reversal and only in case of very strong depreciation.

ii) **The economic policy mechanism.** The restrictive stance of the fiscal policy should have the effect of improve the federal budget deficit on the one side and on the other side to reduce the stimulus to the economic activity. The deceleration of the GDP growth should decrease the imports and improve the current account balance. Obviously, the entity of the improvement depends on the elasticity of imports. The elasticity of imports to income in US is higher than the one of export to international demand. Moreover, the development of the international co-operation and of the outsourcing increased dramatically the imports elasticity to income since some goods are not anymore produced in the US

A restrictive stance of monetary policy could have a positive effect on the current account balance via a deceleration of GDP growth as in the previous case. However an increase in the interest rate should determine also capital inflows and an appreciation of the dollar exchange rate with a negative impact on the current account balance.

Since so many factors influenced the transmission mechanism, the study of the adjustment mechanisms of US current account and the effects on the global economy of such an adjustment is an extremely demanding task. .

III.3 Simulations of the effects of current account adjustments in the US: who is going to pay for the adjustment?

i) **The exchange rate mechanism.**

In the simulation now described, we started from the assumption that sooner or later the US imbalances will have to be corrected. The exercise sought to evaluate the

extents to which adjustment mechanisms will be effective, and what will be the impact of such an adjustment on the main countries.

We used the OEF forecasting model to perform the simulations. We first simulated for the period 2007-2009 the effect of a dollar nominal exchange rate depreciation of 10% (in the second quarter of 2007) with respect to the yen and the euro (see the table for simulation 1 in the appendix)

The effects on the US economy. The dollar exchange rate depreciation on the US economy should have a major impact on US exports, which in 2007 would amount to a 2.5 percentage point increase with respect to the OEF baseline scenario (in appendix 1) The adjustment would also occur through imports (-1.2 percentage points with respect to the baseline scenario). Imports would decrease not only because of the exchange rate impact but also, in the following two years, because of the decrease in domestic demand. The current account deficit would diminish marginally in 2007 and slightly more so in the following two years (0.8 and 1.2 GDP points with respect to the baseline scenario). US GDP would not change significantly with respect to the baseline scenario, there being an increase of 0.6 and 0.8 percentage point in 2007 and 2008, and a 0.5 percentage point decrease in the growth rate in 2009.

The effects on Japan. In the above scenario there would be spillover effects on the Japanese economy. The yen's nominal appreciation next to the decrease in US demand for imports from Japan would entail a decrease in Japanese exports. GDP would decrease by 0.2 and 0.4 percentage points respectively in 2008 and 2009. Considering that the Japanese economy is export-led, this result is not surprising.

The effects on China. In the simulation, it seemed that the major effects would occur in the Chinese economy. GDP in China would decrease over the three years by respectively 0.3, 1.3 and 2.1 percentage points with respect to the baseline scenario. The effects of devaluation on the Chinese current account would be minor since the decrease in exports would be partly offset by the imports decrease due to the reduction in the GDP growth rate.

The effects on the euro area. According to the simulation, the effects on the euro area's GDP would be respectively -0.4, -0.6, -0.8 in 2007-2009 with respect to the baseline scenario, To be noted is that the deflationary impact of euro appreciation would produce, owing to the reaction function in the model, a sharp decrease (with respect to the baseline scenario) in short-term interest rates which would partly offset the negative impact on GDP. The appreciation impact on the euro area current account, however, would be very limited, accounting for a 0.1 percentage point decrease only in 2008.

Owing to this sharp increase in the short-term interest rates, we performed the simulation fixing the short-term interest rate. This enabled us to determine what

would happen if the monetary authority was less reactive to the appreciation of the euro.¹⁵

In simulation 2 (see the table in the appendix), in spite of the 10% appreciation of the euro in nominal terms, we kept the policy interest rates fixed at the values of the first quarter of 2007 (3.75). The depressing impact on GDP was now much greater than in the first simulation with ECB reaction.

In conclusion, the correction of the US current account deficit brought about through a 10% depreciation of the nominal dollar exchange rate would not be of a great amount, in spite of second-round effects due to the increase in the Federal Reserve funds rate intended to curb inflation. The cost of the adjustment would be borne mainly by China. In fact, because of the high percentage of exports as GDP components, the Chinese economy would be penalised by the loss of competitiveness due to the depreciation of the dollar exchange rate. The effects on the euro area GDP, under the assumption of a BCE reaction to the euro appreciation, would be lower but not negligible?.

ii) The economic policy mechanism.

In a third simulation (simulation 3 in the appendix) we tested the impact on the main industrialised countries of an adjustment of the US current account deficit brought about by a reduction in the federal budget deficit. We assumed a restrictive fiscal policy stance that halved current expenditure in the period observed.¹⁶

The cumulated effect of the current account deficit reduction with respect to simulation 1 (dollar exchange rate devaluation) was lower (1.1 instead of 2.3% of GDP in simulation 1). To be noted is that the distribution of the adjustment costs would be very different. Hence, according to the model, the restrictive fiscal policy stance would give rise to a reduction in the short-term interest rates (they would be 1% lower than the baseline? in 2007, 1.2 and 0.5 points in 2008-09. Notwithstanding this monetary policy reaction, the adjustment cost for the USA of a fiscal policy-driven adjustment would be much greater than in the case of exchange rate adjustment.. By contrast, in the Euro area and Japan there would be a small contraction in 2007, and a GDP increase with respect to the baseline? in 2008 and 2009.

To sum up, a fiscal policy adjustment process would improve the federal government account, but the effect on the current account deficit would be less than that obtained through the exchange rate adjustment, and it would be more costly for the US. However, the adjustment cost for the other industrialised countries would be very low.

¹⁵ We refer to the asymmetric behaviour of the ECB during disinflationary episodes with respect to inflationary ones.

¹⁶ We adopted a 'pacifist hypothesis' by halving all items of military expenditure.

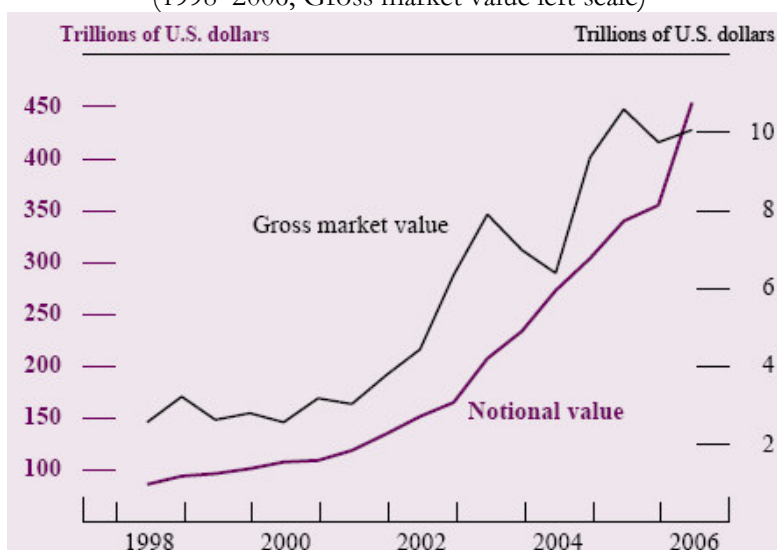
IV Some shortcomings of the macroeconomic model.

IV.1 The role and the risks of cross-border derivatives

In modern applications of the macroeconomic theory of global imbalances, further important issues arise. Unfortunately, however, they lie beyond the capacities of our analysis using the Oxford forecasting model. The main issues concern the role of cross-border financial derivatives¹⁷ in international capital movements.

The question arises as to the extent that a concept of global imbalances conceived in a world with capital mobility but with a minor role played by cross-border derivatives makes sense in a scenario in which the fastest-growing component of international capital movements derives from financial derivatives.

Graph 6. Gross market value¹⁸ and notional value of global derivatives outstanding, (1998–2006, Gross market value left scale)



Source: Bank for International Settlements

“The global derivatives market has grown rapidly in the past decade. By one measure of market size, the notional value¹⁹, which is used to determine the payments made on a derivatives contract, the

¹⁷ The available data suggest that cross-border derivatives – where a resident of one country trades with a resident of another – make up a substantial share of derivatives’ transactions. Recognizing this fact, the International Monetary Fund (IMF) has recommended that its member countries include cross-border derivatives in their reports on external-sector finance.

¹⁸ Gross market value is the sum of the total gross positive market value of contracts with all counterparties and the absolute value of the total gross negative market value of contracts with non-reporting counterparties. The term gross indicates that for multiple contracts with the same counterparty, contracts with positive market values and contracts with negative market values are not netted.

¹⁹ The notional value of a derivative is specified in the contract and is one of the bases on which the payments made on the contract are computed. For example, in the case of a contract known as a

derivatives market expanded from about \$87 trillion in 1998 to about \$454 trillion in 2006. Measured by the price at which a derivatives contract can be purchased in a current transaction, or the market value, the derivatives market grew from \$3 trillion in 1998 to \$10 trillion in 2006". (Federal Reserve Bulletin, May 2007)

The main characteristic of modern financial markets is the rapid evolution of financial derivatives. These new instruments have proved to be important tools for risk management and as investment vehicles. The importance of financial derivatives as flexible and cost effective instruments for managing risks is evidenced by their explosive growth.

This dramatic growth has raised concerns about the complexity of these instruments and the ability of managers, regulators, and market participants in general to understand the risks associated with their use. This concern is justified in that these new instruments and products raise a significant challenge against existing regulatory, supervisory, accounting, and legal frameworks.

In this section we provide a short overview of what may be the effects and the risks of the presence of financial derivatives in international financial markets.

There is general agreement among central bank analysts that the growth of derivatives has affected the manner in which monetary policy is conducted. Clearly, derivatives have had a fundamental impact on traditional quantity indicators of monetary policy such as monetary and credit aggregates.²⁰

Firstly, derivatives alter the demand for money. By providing efficient management of risks and innovative investment strategies tied to market events, derivatives reduce transactions, precautionary, and speculative demands for money. Furthermore, derivatives reduce transactions costs in financial markets, allowing economic agents to operate with lower transactions balances. In particular, a major transaction cost in financial markets is the bid-ask spread. Informational asymmetries and trading volume are important factors in determining this spread, and derivatives affect both of them. The higher leverage in derivatives markets attracts information-motivated traders, so that the traders' private information can be more efficiently incorporated into publicly observable prices.

As a result of this greater informational efficiency, the spread in the underlying cash market is narrowed, which reduces transactions costs, and therefore the demand for narrow money. These structural shifts in money demand heighten uncertainty about the demand-for-money function, complicating the traditional conduct of monetary policy. Second, the general usefulness of the broader monetary aggregates has been adversely affected as derivatives markets have grown.

foreign exchange forward, in which two parties agree to exchange an amount of currency at a future date, the notional value is the amount of currency to be exchanged.

²⁰ On this issue see Oldani (2004, 2007)

Thus, derivatives play a two-fold role in the economy. They perform a useful role in hedging and risk management so as to facilitate capital flows to developing economies. At the same time, however, they create the conditions in which risk can be raised in relation to capital through leveraging and by dodging prudential regulatory safeguards.

They can also make fixed exchange rate systems less stable, and then accelerate the pace and deepen the impact of a devaluation once it occurs. This increases the systemic risk in financial markets and raises the possibility that contagion spreads amongst economies. In the wake of the crisis they can make the process of post-crisis recovery policy-making even more difficult. Table 6 shows a selection of the main risks and regulatory concerns due to the massive presence of derivatives in the international financial markets.

Tab 6 Risks and regulatory concerns about financial derivatives

Reducing transparency	<p>Derivatives give rise to transparency problems in two ways: i) they distort the meaning of balance sheets as the basis for measuring the risk profile of firms, central banks and nation accounts. ii) when traded over-the-counter, derivatives lack adequate reporting requirements and government surveillance. The introduction of derivatives drives a wedge between total risk exposure and that reflected by balance sheets. Off-balance sheet exposure can distort the risk exposure indicated by balance sheets. The lack of transparency caused by off-balance sheet positions is also a problem for the economic public in their efforts to assess a central banks' ability to intervene in the foreign exchange market. The ability to intervene is critical in the context of a fixed exchange rate regime, but it is also important in the context of a floating rate system in order to stabilize the economy following a speculative attack or some other financial market disruption. The problem arises when a central bank accurately reports the value of its foreign reserves but does not report the amount that it has contracted to sell in the future through foreign exchange forward and swaps contracts. This delinking of total risk exposure from balance sheets also occurs in regard to a nation's balance sheet, i.e. its balance of payments accounts. A country's actual exposure to market risk was once reflected in the maturity and currency denomination of its foreign assets and liabilities in its capital account. That is no longer the case. The currency denomination of assets and liabilities such as foreign loans can be changed with foreign exchange derivatives. Interest rate swaps can alter the interest rate exposure on assets and liabilities. As a result, balance of payments accounts no also longer serve to assess country risk. Derivatives create transparency problems in other ways as well. The lack of reporting and government surveillance limits the government's and market participants' ability to assess the amount of open interest in the market, large positions held by single entities, and the adequacy of collateral and capital. This prevents reliable assessment of the stability of these markets as well as of the markets to which they are linked. In these ways the presence of derivatives can make it difficult for firms to make an accurate assessment of their counterparties' creditworthiness. Similarly, the lack of information and data on OTC derivatives means that regulatory authorities cannot detect and deter manipulation in the immediate or related markets. In addition, the regulatory authorities cannot know the outstanding positions – whether measured gross or net – of their financial sectors or major participants in the financial sector. Hence they cannot know the extent of the risk to which their financial markets are exposed in comparison to the capital on hand. As a result, it is difficult for government regulators or supervisors to track the economy's sensitivity to changes in certain key market variables such as interest rates and exchange rates.</p>
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<p>Avoiding regulatory safeguards.</p>	<p>Investors sometimes use derivatives in order to avoid prudential regulations. Derivatives are used to manipulate accounting rules in various ways, to dodge restrictions on foreign exchange exposure on financial institutions' balance sheets and to lower required capital holdings. Accounting rules distinguish different types of assets and receivables by their creditworthiness or credit rating. These rules assign capital charges according to their credit risk, and in some cases government regulations prohibit financial institutions from holding certain classes of assets. Some tax provisions are designed to enhance regulatory safeguards by raising the relative costs of certain financial activities deemed to be less productive. For instance, long-term capital gains may be taxed at a lower rate than short-term gains in order to raise the reward on long-term investing. Using derivatives, payments, receipts and income can be shifted from one period to another. Transactions can be restructured so that they appear to occur as capital gains instead of interest payments (or vices versa), or as long-term capital gains instead of short-term ones. This problem is doubly important for developing economies whose tax bases are not well established, and where threats to their tax base can put fiscal pressures on the government that can lead to monetary expansion or greater foreign borrowing. Another problem is the tendency for derivatives to be used to raise the level of risk relative to capital. This can occur even within the regulatory structure. Derivatives are designed to create price exposure so that risk can be transferred from one party to another without the expense of transferring title and principal as required to buy or short-sell. If the initial payment is thought of as equity or capital, then the size of the notional principal in comparison to capital is the degree of leverage in the derivative instrument. This leverage allows investors to assume far greater degrees of risk per dollar of capital than would be available by purchasing the asset outright or even borrowing in order to purchase the asset outright. Leverage enables derivatives to offer a more efficient use of capital for hedging or investing, and at the same time it reduces the amount of capital backing a given amount of price exposure. Raising the risk-capital ratio weakens the stability of each investor, and in turn it increases everyone else's exposure to the repercussions from investor failure.</p>
<p>Threatening the stability of fixed exchange rate systems.</p>	<p>The presence of a market for foreign exchange derivatives can undermine the stability of a fixed exchange rate system. Derivatives provide greater leverage and lower transactions costs for investors taking a position against the success of the fixed exchange rate. Lowering the costs of betting against the fixed exchange rate will only encourage this behaviour and strengthen the effects of those efforts. The greater the volume of positions that are short of the currency, i.e. against the fixed rate regime, the greater the necessary size of the central bank intervention or interest rate hikes needed to defend the currency peg. The presence of foreign exchange markets means that the central bank is faced with the greater task of having to peg the exchange rate in two markets: the spot markets; and the forward or swap market for foreign currency. Whereas the spot market is large in relation to the amount of foreign reserves at the central bank, and thus the central bank's potential for intervention is small in regard to the overall size of the market, the size of the derivatives market is unlimited. Together they increase the critical size for a successful central bank intervention.</p>
<p>Quickening and deepening the crisis.</p>	<p>In the event of a devaluation or a sharp downturn in securities prices, derivatives such as foreign exchange forwards and swaps and total return swaps quicken the pace and deepen the impact of the crisis. Derivatives transactions with emerging market financial institutions generally involve strict collateral or margin requirements. For example East Asian firms swapping the total rate of return on a local security against LIBOR are posting U.S. dollars or Treasury securities as collateral; the rate of collateralization is estimated at around 20% of the notional principal of the swap. If the market value of the swap position were to decline,</p>

	<p>then the East Asian firm would have to add to its collateral in order to bring it up the required maintenance level. Thus a sharp fall in the price of the underlying security, such as would occur at the beginning of a devaluation or broader financial crisis, would require the East Asian firm to immediately add U.S. dollar assets to its collateral in proportion to the loss in the present value of its swap position. This would trigger an immediate outflow of foreign currency reserves as local currency, and other assets are exchanged into dollars in order to meet their collateral requirements. This would not only quicken the pace of the crisis, it would also deepen the impact of the crisis by putting further downward pressure on the exchange rate and asset prices. thus increasing the losses to the financial sector.</p>
<p>Increasing systemic risk and the risk of contagion.</p>	<p>The presence of a large volume of derivatives transactions in an economy creates the possibility of a rapid expansion of counterparty credit risk during periods of economic stress. These credit risks may then become actual delinquent counterparty debts and obligations during an economic crisis. The implication is that even if derivatives are used to reduce exposure to market risk, they may still lead to an increase in credit risk. For example, a bank lending through variable rate loans may decide to reduce its exposure to short-term interest rate variability, and thus the volatility of its income, by entering into an interest rate swap as the variable rate receiver. If short-term rates were to rise, then the fair market value of the bank's swap position would rise, and thus would increase the bank's gross counterparty credit exposure above that already associated with the loans which were being hedged. In so far as derivatives increase counterparty credit exposure throughout the economy, they increase the impact of one entity becoming unable to fulfil its obligations. And to the extent that derivatives are not used to reduce firms' exposure market, then the greater leverage brought to speculative investments increases the likelihood of such a failure. In this way derivatives contribute to the level of systemic risk in the financial system. The presence of derivatives can also increase the global financial system's exposure to contagion through two channels. Regarding the first, derivatives can spread the stress or crisis in one country to another because of the international nature of markets. Many derivatives involve cross-border counterparties, so that losses of market value and credit rating in one country will affect counterparties in other countries. The second channel of contagion derives from the practice of financial institutions to respond to a downturn in one market by selling in another. One reason why firms sell in other markets is because they need additional funds to purchase liquid G5 currency denominated assets to meet collateral or capital requirements. In order to obtain these assets, firms will make a portfolio shift and sell securities in other markets. This demand for collateral assets can be sudden and sizable when there are large swings in financial markets, and thus this source of contagion can be very rapid .</p>

IV.2 The accounting of cross border derivatives in the US balance of payments.

“Transactions involving derivatives, similarly to stocks or bonds, are recorded in the financial account as increases or decreases in U.S. banking claims on, or liabilities to, foreigners. However, to date, no corresponding entry in the financial account reflects the change in the quantity of U.S. derivatives claims on, or liabilities to, foreigners. Thus, the international transactions accounts shown in the BOP capture only one side of most derivatives transactions.” (Federal Reserve Bulletin May 2007)

It should be noted that accounting for financial derivatives in the BOP modelling and statistics is a challenging task. Therefore, derivatives do not fit neatly into the international transactions accounts for two main reasons. Firstly unlike other financial instruments (i.e. bonds and stocks) some derivatives contracts cannot be considered exclusively as assets or liabilities.²¹

Secondly, derivatives are not easily incorporated into the international transactions accounts because of the ambiguous status of the associated payments. The periodic payments on derivatives can be considered returns on invested capital, which are recorded in the current account; alternatively, they can be considered realized gains from changes in the contractual value, which are recorded in the financial account.²²

Despite the difficulty of fitting cross-border financial derivatives into international accounts, this is a necessary task for the Monetary Policy Authorities. The omission of derivatives positions from the International Investment Position distorts external-sector reporting and gives rise to biased inferences about the variations in the IIP.

Prior to 2007 the United States published few data on cross-border derivatives owing to their limited availability. In March 2005, the U.S. Department of the Treasury, the Federal Reserve Bank of New York, and the Federal Reserve Board began collecting data on U.S. cross-border transactions and positions in derivatives.

The Treasury International Capital (TIC) reporting system, which has been used for many years to collect data on securities such as stocks and bonds, has been modified in order to consider derivatives transactions and positions (TIC form D²³).

On June 2007, the U.S. Treasury began publishing data on the value of U.S. cross-border derivatives contracts, information that could alter the size of the U.S. current account deficit. The new data, which will be published quarterly alongside the TIC data, will improve the information available on U.S. cross-border capital flows and IIP.

²¹ During the lives of swaps, forwards, and futures, the fair market value may be positive at times and negative at times, and it may switch signs several times. Thus these instruments are neither strictly claims, with positive fair values and payments to the U.S. resident counterparty to the contract, nor strictly liabilities, with negative fair values and payments from the U.S. resident counterparty.

²² See on this issue Robert M. Heath (1998), "The Statistical Measurement of Financial Derivatives," IMF Working Paper 98/24 (Washington: International Monetary Fund, March).

²³ The TIC forms collect data on cross-border transactions and positions on a locational basis, as is required for reporting in the international transactions accounts. In other words, counterparties are identified according to the country in which the immediate transactor is located or the country in which the position is booked, as transactions and positions are recorded in this way in the BOP and IIP. Other reports collect cross-border position information on an ultimate-risk basis. These reports identify counterparties according to the country in which the ultimate risk lies. For more information on the differences between data collected on a locational basis and data collected on an ultimate-risk basis, see Carol C. Bertaut, William L. Grier, and Ralph W. Tryon (2006), "Understanding U.S. Cross-Border Securities Data," Federal Reserve Bulletin, vol. 92, pp.A59–A75.

It is worth noting that many other countries currently report derivatives transactions and positions separately on their balance of payments and international investment position.

Tab. 7 Aggregate cross-border derivatives transactions for selected foreign countries, 2005-2006

(Billions of US dollars)

Country or area	2005	2006
Australia	-1.6	0.5
Denmark	1.7	2.8
France	9.9	4.3
Hong Kong	4.0	5.1
Italy	3.1	-1.6
Japan	-6.6	2.0
The Netherlands	-4.4	-7.1
United Kingdom	-4.4	26.2
USA	n.a.*	28.8
World excluding USA	-22.5	-23.0
World	-22.5	5.8

*On June 2007, the Treasury released data covering 2006. Thereafter, the data will be updated quarterly on the day that monthly TIC data are published.

Source: International Monetary Fund, IFS

A comparison of aggregate form D net settlements with the cross-border transactions and positions reported by other countries suggests that U.S. residents are counterparties to a significant share of the transactions in the global cross-border derivatives market. Total U.S. transactions as reported on form D were larger in absolute value than those reported by any other country in 2006 (table 6).

A comparison of U.S. aggregate derivatives claims and liabilities with those of other countries further shows the sizable role played by the United States in the global derivatives market. In 2006 U.S. derivatives claims and liabilities, approximated using the gross positive and gross negative fair values on form D, were greater than those reported by all countries except the United Kingdom.

These figures reinforce our basic idea that a correct account of cross-border derivatives in BOP accounts is necessary to analyze the US global imbalances issues. The omission of derivatives from the modelling may make the analysis biased and incomplete.

IV.3 The role of derivatives in the recent financial turmoil in USA

The centre of the recent international financial turmoil has been the US sub-prime²⁴ mortgage market. This is a relatively new market that is greatly facilitated by the use of financial innovating instruments (i.e. derivatives).

²⁴ Subprime mortgages are residential loans that do not conform to the criteria for "prime" mortgages, and so have a lower expected probability of full repayment. This assessment is usually

Several legal provisions facilitated the development of the modern subprime mortgage market in the USA. “Interest rate caps imposed by states were pre-empted by federal legislation in 1980, while lenders have been allowed to offer adjustable-rate mortgages since 1982. Moreover, the Tax Reform Act of 1986 left residential mortgages as the only consumer loans on which the interest was tax deductible. This made home equity withdrawal a preferred means of financing home improvements and personal consumption, relative to other forms of consumer loans”.

Automated underwriting and securitization were also key developments in reducing the cost of subprime mortgage lending. Automated underwriting has made loan origination more cost efficient, while advances in statistical credit scoring have led to more accurate and consistent assessments of borrower credit risk. Securitization has also facilitated market growth by dispersing risk, providing investors with a supply of highly-rated securities with enhanced yield, and opening up the origination business to non-depository specialty finance companies .

The highest delinquency rates²⁵ are associated with “affordability products” such as “hybrid” and “option” ARMs. These require interest-only payment at fixed “teaser” rates that can result in negative amortization during the first few years. In addition, the worst performing loans have involved risk “layering”—high LTV loans to high DTI borrowers who offer little income verification.

The IMF report, released on September 24²⁶, said *“the turbulence represents the first significant test of innovative financial instruments and markets used to distribute credit risks through the global financial system, with markets recognizing the extent that credit discipline has deteriorated in recent years. This has caused a repricing of credit risk and a retrenchment from risky assets that, combined with increased complexity and illiquidity, has led to disruptions in core funding markets and increased market turbulence in August”*

Conclusions: true or false?

Although the decline in the current account/GDP has been very large - three standard deviations since the early 1990s - to date the real value of the US dollar does not appear to have suffered significantly from these developments, despite widely expressed fears of a "hard landing" and other recurrent dire warnings of a catastrophe.

made according to the borrower's credit record and score, debt service-to-income (DTI) ratio and, in some cases, the mortgage loan-to-value (LTV) ratio.

²⁵ Statistically, the number of loans with delinquent payments divided by the number of loans held in a portfolio. Sometimes, the rate is based on the total dollar volume of the loans instead of the number. Generally, delinquency is defined to include only loans where payments are three or more months past due.

²⁶ IMF Financial Stability Report

Recalling the appealing approach of the paper by Backus et al. (2005), in this section we conclude this by seeking to adjudicate some assertions concerning the US current account imbalances.

The US external deficit is sustainable. The verdict is that this is true in the short-medium term. The CA deficit is financed by foreign capital inflows. Many observers have questioned whether such inflows are sustainable, and they have expressed concern about the economic impact should foreign capital inflows decline rapidly. Some fear that a rapid decline in the CA deficit may cause a recession because, presumably, a decline in the CA deficit would trigger a sharp drop in the value of the dollar and a rise in interest rates (which could lower asset values). However, economic theory and empirical evidence suggest that should the CA deficit decline slowly, economic activity would not be greatly disrupted because production in the trade sector would be stimulated. Thus, the main issue of interest to policymakers may be whether a decline in the deficit would be gradual or sudden.

According to the preliminary results of our analysis we believe that the most likely scenario for the U.S. current account in the medium term is a soft landing. Currency crises tend to occur in emerging countries rather than in industrial ones, and in countries with a managed exchange rate system, in which the government fixes its exchange rate or allows it to fluctuate only within a narrow band. Neither of those factors applies to the United States. The unique role of the U.S. dollar as the world's reserve currency also helps to reduce the probability of a sudden stop of foreign financing.

Nearly all U.S. international liabilities are denominated in dollars, but, at the same time, about two-thirds of U.S. holdings of assets abroad are equity assets, denominated in host countries' currencies. Therefore, a large depreciation of the dollar would lower net U.S. liabilities to foreign investors not only by lowering net imports but also by boosting the dollar value of U.S. assets abroad. Consequently, the depreciation would not necessarily feed on itself and become a full-blown dollar crisis, unlike the effects of a sharp drop in the currency of a country with a large amount of debt denominated in foreign currencies. The strength of U.S. financial markets and the ability of U.S. entities to borrow in their own currency should help mitigate the risk of a sudden stop turning into a severe financial crisis and economic recession.

Because most U.S. international debts are denominated in dollars, a currency crash would be less likely to inflate U.S. borrowers' debt burden and cause widespread bankruptcy than it would be in an emerging economy. At the same time, that crash would enhance the dollar value of most foreign assets owned by U.S. residents, mitigating their possible financial losses. Moreover, the Federal Reserve System could attempt to limit the spread of a dollar crisis by lowering short-term interest rates, an option not available to a country whose debts are denominated in foreign currencies.

Over time, a lower dollar would help improve investment and employment by boosting the price competitiveness of U.S. products in sectors that export and those that compete with imports.

The deficit will induce the dollar to depreciate.²⁷ The verdict is: neither true nor false...: *“economic disturbances may cause exchange rates and the current-account balance to move in the same direction while other disturbances may cause exchange rates and the current account to diverge”* (Rosenberg and Folkerts-Landau 2002, p 80).

What we can say in light of the recent IMF survey on current account reversal is that the process of current account adjustment in several industrialised countries was in the past accompanied by both a real depreciation of the domestic currency and a slowdown of growth.

Moreover, the dollar’s role as the major reserve currency and medium of international transactions also results in a basic level of demand for the dollar, a stabilizing cushion to the dollar’s exchange value. Even if a sudden stop were to occur, a resulting slowdown in economic activity might be limited.

According to our simulations, the correction of the US CA deficit through a depreciation of the nominal dollar exchange rate would not be of a great amount. The cost of the adjustment would be borne mainly by China. In fact, because of the high percentage of exports as GDP components, the Chinese economy would be penalised by the loss of competitiveness due to the depreciation of the dollar exchange rate. The effects on euro area GDP, under the assumption of a BCE reaction to the euro appreciation, would be lower.

Interest on foreign debt is becoming a significant burden. The verdict is: not true at the moment. As long as U.S. assets yield a higher (risk-adjusted) rate of return than do foreign assets, foreigners will presumably continue to find U.S. assets attractive.

Financial markets automatically equilibrate, and if U.S. assets became less desirable, interest rates would rise to the point where they became desirable again. If both lender and borrower are rational, many economists believe that the CA deficit can be mutually beneficial because it allows the lender to enjoy a higher rate of return than could be enjoyed at home and allows the borrower to operate with a larger capital stock than could be financed from domestic saving. As long as those investments yield a high enough rate of return to service the debt, borrowing should not reduce future domestic income.

It is also interesting to note that the US debt structure has exactly the opposite composition in term of currency with respect to a standard composition of an international debtor. Therefore the latter usually has liabilities denominated in foreign currency, and a depreciation in national currency would worsen the economic

²⁷ These questions are partly taken from Backus et al. (2005)

condition. By contrast, a depreciation of the dollar would increase the returns of assets denominated in foreign currency.

The US external deficit is the result of the government deficit. The verdict is that this is false. The two deficits were never “twins.” They did move in the same direction in the early 1980s, with the budget deficit worsening just a few years before the current account deficit

There were some special circumstances at the time under which the rising budget deficit helped worsen the trade deficit, although it was not the only cause of the latter. With the Federal Reserve maintaining a tight monetary policy in the early 1980s, increasing government borrowing to cover the rising federal budget deficit contributed to higher interest rates, which attracted foreign capital into the U.S.

This inflow of foreign capital in turn contributed to the rise in the value of the dollar, which made US products uncompetitive and thus helped increase the trade deficit. But this chain of causality cannot explain more than part of the rise in the trade deficit

The US external deficit is unprecedented. The verdict is: not completely true. On the one hand, the assertion is true. If we regard evidence on other advanced countries as relevant to the US situation, there are numerous examples of large deficits and surpluses in the distant and recent past.

Edwards found that since 1970, two other developed countries, Ireland and New Zealand, have had high CA deficits that were long-lasting (seven and five years, respectively). Goldman Sachs analyzed all episodes in developed countries since 1980 where the CA improved by more than 2% of GDP. It found 31 cases where the adjustment proved harmful to the economy and 13 where it proved benign. In the harmful episodes, the economy typically started from a position of overheating and the output gap worsened by an average of 3.6% of GDP, whereas in the benign episodes, the economy started from a position of excess capacity and the output gap improved by 1.9%. The fact that the economy was initially overheating in the harmful episodes suggests that causality may run in the opposite direction — the CA shift may be a symptom rather than a cause of economic slowdown. In the harmful cases, there was little real exchange rate depreciation; in the benign cases, it averaged 5.1%.

In most cases, the adjustment took several years. In all cases, consumption growth was negative and average and interest rates on average fell. In only two cases (Portugal in the early 1980s and Finland in the early 1990s) was the CA decline associated with a severe recession. (The recession and CA decline in Finland were widely attributed to the collapse of the Soviet Union.)

Some of these cases may not be applicable to the U.S. experience, however, because the sample includes countries that had a small CA deficit or CA surplus. Only eight

of these episodes involved a larger CA deficit as a share of GDP than the U.S. deficit today, and all of these eight episodes involved small countries.¹

On the other hand, the US CA imbalance is unprecedented if its size and role in the world economy is considered. *“Any comparison based on the experience of small countries, even small industrial countries, is of limited value.”* Obstfeld and Rogoff (2005, p 71)

This is all about the Asian Central Banks. The verdict is: partly true. A recurrent theme in discussions of the US deficit is that a large fraction of it is being financed by Asian central banks. Some economists (Roubini and Setser (2005)) wonder what will happen if they stop. Others (Dooley, Folkerts-Landau, Garber (2003) and Ferguson (2005)) maintain that this phenomenon is the effect of the US dollar’s role in global financial markets.

Reserve accumulation by the emerging Asian economies, whose currencies closely follow the dollar, and the elevated oil price, which has transferred wealth to a few oil exporting countries with often still underdeveloped financial systems, induces a steady flow of purchases of US dollar denominated financial assets. This process also contributes to keeping bond yields low.

China is running a current account surplus of about \$250bl. Both saving and investment are unusually high. There are two main reasons for which the Chinese might want to accumulate assets. One is a rapidly aging population, which suggests that high saving rates may be necessary to finance the old age of current workers. Another is concerns over the stability of the financial system and control of the exchange rate yuan/dollar. If the yuan effectively joins the regional tendency for currencies to be managed relative to a basket of currencies, then the basis may be laid for some more diversification of official reserves out of the dollar.

However as we found in our simulations, exchange rate adjustment is not a particularly powerful method of achieving a reduction of current account deficit. Appreciation of the Chinese yuan should not therefore be viewed as the principal solution to global current account imbalances even if it might have a useful supplementary role to play.

Future research

The new data on the value of U.S. cross-border derivatives contracts will expand the information available on U.S. cross-border capital flows and international investment holdings. Therefore, the omission of derivatives from reports on cross-border flows and positions gives rise to a statistical discrepancy in the BOP accounts and can also lead to mistaken inferences about what is driving changes in the international investment position of the United States.

We believe that an appealing and challenging way to expand research on global imbalances is to include cross-border derivatives in BOP/CU modelling. For this purpose, it is first necessary to fit derivatives neatly into the international transactions accounts.

Appendix

Baseline scenario Oxford Forecasting

U.S.A.										
TABLE 3 GROSS DOMESTIC PRODUCT AND ITS COMPONENTS BILLION 2000 CHAIN DOLLARS										
	CONSUMERS EXPENDITURE	PUBLIC AUTHORITY CONSUMPTION & INVESTMENT	GROSS PRIVATE FIXED INVESTMENT	EXPORTS OF GOODS AND SERVICES	INVESTMENT IN STOCKS	TOTAL FINAL EXPENDITURE	IMPORTS OF GOODS AND SERVICES	GDP	REAL NET EXPORTS	DOMESTIC DEMAND
	(C)	(G)	(IFPR)	(X)	(IS)	(TFE)	(M)	(GDP)	(X-M)	(DOMD)
YEARS BEGINNING Q1										
2007	8356.4	2034.5	1837.4	1406.9	39.1	13622.9	1986.5	11691.1	-579.7	12266.3
2008	8587.1	2058.9	1912.1	1516.4	68.0	14076.5	2100.6	12040.8	-584.2	12620.2
2009	8812.5	2085.5	2053.3	1627.2	79.1	14563.7	2237.3	12414.3	-610.1	13016.8
2007										
I	2067.1	506.4	458.3	342.0	7.5	3369.2	488.1	2894.4	-146.1	3039.3
II	2081.9	507.8	457.5	348.1	9.0	3391.8	493.2	2912.1	-145.2	3056.1
III	2096.6	509.4	459.0	354.9	10.6	3417.4	499.3	2931.9	-144.4	3075.2
IV	2110.7	510.9	462.6	362.0	12.0	3444.5	505.9	2952.8	-144.0	3095.7
2008										
I	2125.7	512.4	467.2	369.0	13.7	3473.4	513.0	2975.2	-144.0	3118.1
II	2139.6	514.0	473.4	375.7	16.3	3503.3	521.3	2997.5	-145.6	3142.0
III	2153.8	515.5	481.3	382.2	18.2	3534.1	529.4	3021.3	-147.1	3167.2
IV	2167.9	517.0	490.2	389.5	19.8	3565.7	536.9	3046.7	-147.4	3192.8
2009										
I	2182.0	518.8	500.2	396.0	20.8	3597.4	545.6	3071.1	-149.6	3219.2
II	2196.0	520.5	509.6	402.6	20.6	3626.7	554.8	3093.1	-152.1	3243.5
III	2209.9	522.2	518.2	410.1	19.5	3655.4	563.8	3114.5	-153.7	3266.1
IV	2224.6	523.9	525.3	418.4	18.3	3684.2	573.1	3135.6	-154.7	3288.0

JAPAN

TABLE 3 GROSS DOMESTIC PRODUCT AND ITS COMPONENTS
BILLION YEN - 2000 PRICES

	CONSUMERS EXPENDITURE	PUBLIC AUTHORITY CONSUMPTION	GROSS FIXED INVESTMENT	EXPORTS OF GOODS AND SERVICES	INVESTMENT IN STOCKS	TOTAL FINAL EXPENDITURE	IMPORTS OF GOODS AND SERVICES	GDP	RESIDUAL ON GDP	DOMESTIC DEMAND
	(C)	(GC)	(IF)	(X)	(IS)	(TFE)	(M)	(GDP)	(GDP-C-GC -IF-X-IS+M)	(TFE-X)
YEARS BEGINNING Q1										
2007	308572.3	97116.6	133084.0	86376.3	-119.1	625030.1	63597.7	561432.4	0.0	538653.9
2008	314663.5	98494.0	138714.0	93230.6	-776.5	644325.5	69574.8	574750.8	0.0	551094.9
2009	320838.6	99761.0	143488.3	99654.1	-236.6	663505.5	76717.3	586788.3	0.0	563851.4
2007										
I	76664.9	24134.5	32651.9	21108.2	6.2	154565.7	15490.6	139075.1	0.0	133457.5
II	76933.0	24210.2	33069.1	21312.0	170.6	155694.9	15790.9	139904.0	0.0	134382.9
III	77280.8	24349.8	33481.7	21747.1	9.9	156869.4	16069.4	140800.0	0.0	135122.3
IV	77693.6	24422.1	33881.3	22208.9	-305.9	157900.2	16246.8	141653.3	0.0	135691.2
2008										
I	78106.3	24533.7	34216.1	22656.1	-269.0	159243.2	16756.0	142487.2	0.0	136587.1
II	78477.1	24551.0	34544.0	23100.4	-100.2	160572.3	17270.7	143301.6	0.0	137471.9
III	78825.6	24670.3	34831.4	23539.5	-133.2	161733.6	17638.7	144094.9	0.0	138194.1
IV	79254.6	24738.9	35122.4	23934.6	-274.1	162776.4	17909.4	144867.0	0.0	138841.8
2009										
I	79695.8	24852.0	35423.2	24340.2	-182.5	164128.7	18511.3	145617.4	0.0	139788.5
II	80035.8	24869.2	35724.4	24729.9	77.8	165437.1	19091.6	146345.5	0.0	140707.2
III	80375.7	24985.1	36022.4	25112.7	3.6	166499.6	19443.8	147055.8	0.0	141386.9
IV	80731.3	25054.7	36318.3	25471.3	-135.5	167440.1	19670.5	147769.6	0.0	141968.8

CHINA

TABLE 3 GROSS DOMESTIC PRODUCT AND ITS COMPONENTS
BILLION YUAN - 2000 PRICES

	CONSUMERS EXPENDITURE	GOVT. EXPENDITURE	GROSS FIXED INVESTMENT	EXPORTS OF GOODS & SERVICES	TOTAL FINAL EXPENDITURE	IMPORTS OF GOODS & SERVICES	DOMESTIC DEMAND	NET DEMAND	GDP	STAT DISCREP (GDP - NET DEMAND)
	(C)	(GC)	(IF)	(X)	(TFE)	(M)	(DOMD)	(YDEM)	(GDP)	(GDP-YDEM)
2007										
I	1894.95	704.53	2334.44	1807.40	6781.32	1333.66	4973.92	5407.66	3730.03	-1677.64
II	1839.92	682.84	2731.95	1963.76	7258.46	1516.21	5294.71	5702.26	4481.88	-1220.38
III	1952.52	714.45	2645.11	2101.48	7453.56	1671.70	5352.08	5741.86	4687.74	-1054.13
IV	2271.16	790.76	3261.89	2187.34	8551.15	1760.32	6363.81	6750.83	6215.55	-535.27
2008										
I	2143.14	761.22	2676.16	2101.45	7720.82	1777.47	5619.37	5904.50	4121.68	-1782.82
II	2092.53	742.67	3086.09	2263.92	8223.70	1953.56	5959.79	6231.64	4952.47	-1279.17
III	2208.42	768.03	2943.70	2383.59	8341.92	2062.68	5958.34	6241.06	5170.57	-1070.49
IV	2524.59	849.09	3575.76	2458.02	9445.34	2110.40	6987.32	7297.06	6837.10	-459.96
2009										
I	2391.89	818.10	2889.09	2363.67	8500.34	2134.15	6136.67	6328.61	4518.82	-1809.79
II	2326.76	798.67	3282.61	2558.80	9004.12	2309.83	6445.32	6657.01	5403.73	-1253.28
III	2448.08	828.00	3116.48	2689.47	9119.02	2451.70	6429.55	6630.33	5615.24	-1015.09
IV	2793.16	904.38	3784.67	2766.03	10284.95	2491.27	7518.91	7756.97	7343.51	-413.46

EURO ZONE

TABLE 3 GROSS DOMESTIC PRODUCT AND ITS COMPONENTS
BILLION EUROS - 2000 PRICES

	CONSUMERS EXPENDITURE	PUBLIC AUTHORITY CONSUMPTION	GROSS FIXED INVESTMENT	EXPORTS OF GOODS AND SERVICES	INVESTMENT IN STOCKS	TOTAL FINAL EXPENDITURE	IMPORTS OF GOODS AND SERVICES	GDP	RESIDUAL ON GDP	DOMESTIC DEMAND
	(C)	(GC)	(IF)	(X)	(IS)	(TFE)	(M)	(GDP)	(GDP-C-GC -IF-X-IS+M)	(TFE-X)
YEARS BEGINNING Q1										
2007	4292.7	1500.2	1629.2	3374.2	39.9	10836.2	3263.6	7572.6	0.0	7462.0
2008	4388.7	1518.9	1679.0	3559.7	39.3	11185.6	3447.0	7738.6	0.0	7625.9
2009	4480.3	1539.3	1725.3	3749.7	37.8	11532.4	3640.6	7891.8	0.0	7782.7
2007										
I	1064.7	373.5	403.0	826.7	8.6	2676.4	799.6	1876.9	0.0	1849.7
II	1069.9	374.4	405.4	837.8	9.8	2697.2	809.9	1887.4	0.0	1859.5
III	1075.9	375.6	408.5	849.2	11.3	2720.6	821.5	1899.0	0.0	1871.3
IV	1082.2	376.7	412.4	860.5	10.2	2741.9	832.6	1909.3	0.0	1881.5
2008										
I	1088.4	378.0	415.9	871.6	9.8	2763.6	843.5	1920.1	0.0	1892.1
II	1093.8	379.1	418.3	884.4	9.2	2784.7	855.3	1929.4	0.0	1900.4
III	1100.1	380.3	420.6	896.3	10.7	2808.1	868.2	1939.9	0.0	1911.7
IV	1106.3	381.5	424.3	907.4	9.6	2829.2	880.1	1949.1	0.0	1921.7
2009										
I	1112.4	382.9	427.7	918.3	8.9	2850.3	891.3	1959.1	0.0	1932.0
II	1117.0	384.1	429.9	931.7	8.7	2871.4	903.6	1967.8	0.0	1939.7
III	1122.6	385.5	432.1	944.1	10.6	2894.8	916.8	1978.0	0.0	1950.7
IV	1128.3	386.7	435.6	955.5	9.6	2915.8	928.9	1986.9	0.0	1960.3

Simulation 1

U.S.A. DIFFERENCE TABLE 1 SUMMARY TABLE. (PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)												
YEARS BEGINNING Q1	CONSUMER EXPENDITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEMPLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EFFECTIVE EXCHANGE RATE	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF GDP!)
2007	0.0	0.1	0.6	1.6	-338.5	0.2	0.2	0.2	0.4	-8.0	0.3	0.2
2008	-0.7	0.1	0.8	4.5	-363.9	0.3	1.5	1.3	1.7	-9.6	0.8	0.1
2009	-2.2	-1.2	-0.5	1.6	396.3	-0.3	1.9	2.8	0.9	-11.7	1.2	-0.3
2007												
I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	0.0	0.0	0.2	0.4	-125.0	0.1	0.0	0.0	0.1	-11.3	0.0	0.0
III	0.0	0.1	0.9	2.2	-498.4	0.3	0.2	0.2	0.5	-10.5	0.5	0.3
IV	0.0	0.2	1.2	3.9	-730.8	0.5	0.6	0.4	1.2	-10.3	0.6	0.4
2008												
I	-0.2	0.2	1.2	4.9	-712.8	0.5	1.0	0.7	1.5	-9.7	0.7	0.3
II	-0.5	0.2	1.0	5.0	-532.8	0.4	1.4	1.1	1.8	-9.4	0.8	0.2
III	-0.8	0.0	0.7	4.5	-258.0	0.3	1.7	1.4	1.8	-9.4	0.9	0.1
IV	-1.3	-0.3	0.3	3.6	47.8	0.1	1.9	1.8	1.6	-9.8	1.0	-0.1
2009												
I	-1.7	-0.6	-0.1	2.6	299.2	-0.1	1.9	2.2	1.3	-10.5	1.1	-0.3
II	-2.0	-1.0	-0.4	1.7	442.1	-0.3	1.9	2.6	1.0	-11.3	1.2	-0.3
III	-2.3	-1.4	-0.7	1.2	463.5	-0.4	1.8	3.0	0.8	-12.2	1.2	-0.4
IV	-2.6	-1.6	-0.8	1.1	380.7	-0.5	1.9	3.3	0.6	-12.9	1.2	-0.4

JAPAN												
DIFFERENCE TABLE 1 SUMMARY TABLE.												
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)												

YEARS BEGINNING Q1	CONSUMER EXPEND- ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM- PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF GDP!)
2007	-0.1	0.0	0.2	0.2	-38.1	0.1	0.0	0.2	0.3	0.2	0.2	0.0
2008	-1.9	-0.7	-0.2	0.5	-55.3	0.0	0.3	1.4	0.3	2.3	1.0	-0.2
2009	-3.1	-1.2	-0.9	-0.4	132.4	-0.4	0.7	2.1	0.2	0.4	1.7	-0.5
2007												
I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	0.0	0.1	0.2	0.1	-19.4	0.0	0.0	0.0	0.1	-0.1	0.3	0.1
III	0.0	0.0	0.3	0.3	-52.4	0.1	0.0	0.2	0.4	0.1	0.3	0.1
IV	-0.3	-0.2	0.3	0.5	-80.6	0.1	0.1	0.6	0.6	1.0	0.4	0.0
2008												
I	-0.9	-0.4	0.2	0.6	-94.1	0.1	0.2	0.9	0.5	1.9	0.6	0.0
II	-1.6	-0.6	0.0	0.6	-82.4	0.1	0.3	1.3	0.4	2.4	0.9	-0.1
III	-2.2	-0.9	-0.3	0.6	-48.3	0.0	0.4	1.6	0.3	2.5	1.2	-0.2
IV	-2.7	-1.0	-0.5	0.3	3.5	-0.2	0.5	1.8	0.1	2.3	1.4	-0.3
2009												
I	-3.0	-1.2	-0.7	0.1	62.3	-0.3	0.6	1.9	0.1	1.6	1.6	-0.4
II	-3.1	-1.2	-0.9	-0.3	117.6	-0.4	0.7	2.1	0.1	0.8	1.7	-0.5
III	-3.1	-1.2	-1.0	-0.6	161.9	-0.5	0.7	2.2	0.2	0.0	1.8	-0.5
IV	-3.1	-1.2	-1.0	-0.8	187.7	-0.6	0.8	2.3	0.3	-0.7	1.9	-0.5

CHINA DIFFERENCE TABLE 1 SUMMARY TABLE.
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPENDITURE	REAL INVESTMENT	GDP	INDUSTRIAL OUTPUT	UNEMPLOYMENT ESTIMATE (000s)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICE INDEX	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF GDP!)
2007	0.0	-0.3	-0.3	-0.2	546.8	-0.1	0.0	0.1	0.1	-3.9	0.0	0.0
2008	-0.3	-1.6	-1.3	-1.3	2906.8	-0.4	-0.1	0.2	0.3	-6.1	0.0	0.0
2009	-0.5	-3.1	-2.1	-2.8	5088.2	-0.7	-0.5	-0.1	0.1	-6.7	0.0	0.0
2007												
I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	0.0	0.0	-0.2	-0.1	326.8	0.0	0.0	0.0	0.0	-5.0	-0.1	0.0
III	0.0	-0.3	-0.3	-0.2	686.7	-0.1	0.0	0.1	0.0	-5.1	0.1	0.0
IV	-0.1	-0.7	-0.5	-0.4	1173.8	-0.2	0.0	0.2	0.2	-5.6	0.2	0.0
2008												
I	-0.2	-1.1	-1.0	-0.7	2032.9	-0.3	0.0	0.2	0.2	-5.9	0.1	0.0
II	-0.2	-1.4	-1.1	-1.1	2566.3	-0.4	-0.1	0.3	0.3	-6.1	0.1	0.0
III	-0.3	-1.6	-1.3	-1.5	3092.3	-0.4	-0.1	0.3	0.4	-6.1	0.0	0.0
IV	-0.4	-2.3	-1.7	-1.9	3935.8	-0.6	-0.1	0.2	0.3	-6.2	-0.1	0.0
2009												
I	-0.5	-2.6	-2.4	-2.4	5285.6	-0.8	-0.2	0.1	0.2	-6.3	-0.3	-0.1
II	-0.5	-3.1	-2.4	-2.8	5461.9	-0.8	-0.4	-0.1	0.2	-6.5	-0.1	-0.1
III	-0.6	-3.4	-2.2	-3.0	5214.4	-0.7	-0.5	-0.2	0.0	-6.8	0.1	0.0
IV	-0.6	-3.3	-1.7	-2.9	4390.7	-0.6	-0.7	-0.3	-0.2	-7.2	0.3	0.0

EURO ZONE DIFFERENCE TABLE 1 SUMMARY TABLE.
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPENDITURE	TOTAL INVESTMENT	GDP	INDUSTRIAL OUTPUT	UNEMPLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE (\$/EURO)	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF GDP!)
2007	1.2	0.4	-0.4	-1.0	150.4	-0.1	-0.4	-1.2	-2.4	27.2	0.7	-0.3
2008	2.0	0.8	-0.6	-1.7	112.6	0.0	-2.1	-3.0	-3.5	34.6	-0.1	-0.4
2009	2.4	1.0	-0.8	-2.1	109.4	0.0	-3.9	-5.0	-4.0	39.5	0.1	-0.5
2007												
I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	1.0	0.3	-0.6	-1.1	192.7	-0.1	-0.1	-1.4	-2.8	37.9	0.9	-0.4
III	1.8	0.6	-0.5	-1.2	198.3	-0.1	-0.6	-1.4	-3.7	34.8	1.2	-0.4
IV	1.9	0.7	-0.6	-1.9	210.5	-0.1	-0.9	-1.8	-2.9	35.5	0.6	-0.5
2008												
I	1.9	0.5	-0.7	-1.8	187.2	-0.1	-1.4	-2.2	-3.2	34.5	0.1	-0.5
II	1.9	0.7	-0.6	-1.8	138.4	-0.1	-1.9	-2.8	-3.4	34.1	-0.2	-0.5
III	2.2	1.0	-0.5	-1.6	68.2	0.0	-2.3	-3.2	-3.6	34.2	-0.2	-0.4
IV	2.2	1.1	-0.7	-1.7	56.4	0.0	-2.7	-3.7	-3.7	35.4	0.0	-0.4
2009												
I	2.2	1.0	-0.8	-1.8	71.3	0.0	-3.1	-4.1	-3.9	36.9	0.2	-0.4
II	2.3	1.0	-0.8	-2.0	83.9	0.0	-3.6	-4.7	-4.0	38.5	0.3	-0.4
III	2.5	1.0	-0.9	-2.2	119.6	0.0	-4.1	-5.3	-4.0	40.5	0.1	-0.5
IV	2.7	0.9	-0.9	-2.4	162.7	-0.1	-4.7	-5.9	-4.0	42.3	-0.1	-0.5

Simulation 2.

EURO ZONE DIFFERENCE TABLE 1 SUMMARY TABLE.

(PERCENTAGE CHANGES FROM BASE , UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND- ITURE	TOTAL INVESTMENT	GDP	INDUSTRIAL OUTPUT	UNEM- PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE (\$/EURO)	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF GDP!)
2007	0.1	-0.9	-1.2	-1.9	414.8	-0.3	-0.6	-1.1	-0.2	27.6	0.8	-0.8
2008	-0.6	-3.4	-2.7	-4.3	934.5	-0.7	-3.3	-3.2	-0.5	36.0	0.3	-1.7
2009	-1.1	-5.2	-3.8	-5.7	1420.3	-1.1	-6.5	-6.4	-0.5	44.0	0.4	-2.3
2007												
I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	0.3	-0.4	-1.1	-1.6	332.1	-0.2	-0.1	-1.4	-0.1	37.9	0.8	-0.8
III	0.2	-1.3	-1.7	-2.5	581.3	-0.4	-0.7	-1.3	-0.2	36.6	1.3	-1.1
IV	-0.1	-2.0	-2.1	-3.6	746.0	-0.5	-1.4	-1.7	-0.4	35.0	0.9	-1.3
2008												
I	-0.4	-2.7	-2.4	-4.0	832.7	-0.6	-2.2	-2.2	-0.5	34.6	0.4	-1.5
II	-0.7	-3.2	-2.6	-4.2	900.4	-0.7	-3.0	-2.9	-0.5	35.2	0.1	-1.6
III	-0.7	-3.5	-2.8	-4.4	949.3	-0.7	-3.6	-3.5	-0.5	36.2	0.2	-1.7
IV	-0.8	-3.9	-3.1	-4.8	1055.6	-0.8	-4.3	-4.2	-0.5	38.0	0.3	-1.9
2009												
I	-1.0	-4.5	-3.5	-5.2	1200.2	-0.9	-5.1	-5.0	-0.5	40.3	0.5	-2.0
II	-1.1	-5.0	-3.7	-5.6	1344.9	-1.0	-6.0	-5.9	-0.5	42.8	0.5	-2.3
III	-1.1	-5.4	-4.0	-6.0	1496.2	-1.1	-6.9	-6.9	-0.5	45.3	0.4	-2.4
IV	-1.0	-5.8	-4.1	-6.2	1639.7	-1.2	-7.9	-7.9	-0.5	47.8	0.2	-2.6

Simulation 3

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U.S.A.		DIFFERENCE TABLE		SUMMARY TABLE.								
		1		(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)								
YEARS	CONSUMER EXPENDITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEMPLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE	EFFECTIVE EXCHANGE RATE (PTS)	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF GDP!)
BEGINNING Q1												
2007	-0.2	-0.8	-1.6	-3.0	1290.2	-0.9	-0.7	0.0	-1.0	-1.0	0.4	0.9
2008	0.5	-1.5	-1.5	-3.9	777.2	-1.0	-1.9	-0.3	-1.4	-2.6	0.2	1.7
2009	1.3	-0.6	-0.6	-1.2	381.2	-0.6	-1.2	-0.7	-0.3	-1.2	0.5	1.9
2007												
I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	-0.2	-0.6	-1.9	-2.2	1546.8	-1.1	-0.3	0.0	-0.6	-0.2	0.4	1.3
III	-0.3	-1.1	-2.3	-4.2	1875.5	-1.3	-0.9	0.1	-1.7	-1.6	0.5	1.2
IV	-0.1	-1.5	-2.3	-5.3	1738.4	-1.3	-1.5	0.1	-1.6	-2.2	0.5	1.3
2008												
I	0.0	-1.7	-2.1	-5.4	1408.0	-1.3	-1.9	-0.1	-1.7	-2.6	0.3	1.4
II	0.2	-1.6	-1.8	-4.7	961.9	-1.1	-2.1	-0.2	-1.7	-2.8	0.1	1.7
III	0.7	-1.4	-1.3	-3.5	517.1	-0.9	-2.0	-0.4	-1.4	-2.7	0.2	1.9
IV	1.0	-1.1	-0.9	-2.3	221.8	-0.7	-1.7	-0.5	-0.9	-2.3	0.3	2.0
2009												
I	1.2	-0.8	-0.6	-1.4	140.2	-0.6	-1.4	-0.6	-0.6	-1.8	0.4	2.0
II	1.4	-0.6	-0.5	-1.0	229.8	-0.6	-1.2	-0.7	-0.3	-1.3	0.5	2.0
III	1.3	-0.5	-0.6	-1.0	441.5	-0.6	-1.1	-0.8	-0.1	-0.9	0.5	1.9
IV	1.2	-0.5	-0.8	-1.5	713.3	-0.7	-1.1	-0.8	-0.2	-0.7	0.6	1.8

JAPAN DIFFERENCE TABLE 1 SUMMARY TABLE.
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND- ITURE	REAL PERSONAL INCOME	GDP	INDUSTRIAL OUTPUT	UNEM- PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF GDP!)
2007	0.4	0.0	0.0	-0.2	15.3	0.0	0.0	-0.1	-0.3	-1.3	-0.2	0.1
2008	3.2	0.6	1.8	1.4	-314.2	0.5	0.2	0.1	0.7	-3.8	-0.5	0.8
2009	2.6	1.0	2.1	2.9	-539.9	0.9	1.5	1.1	1.3	-2.2	-0.6	1.0
2007												
I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	0.0	-0.1	-0.2	-0.2	23.3	0.0	0.0	0.0	-0.4	-0.2	-0.2	0.0
III	0.3	-0.1	-0.2	-0.4	42.2	-0.1	0.0	-0.1	-0.7	-1.8	-0.2	0.0
IV	1.4	0.1	0.4	-0.2	-4.3	0.0	-0.1	-0.1	0.0	-3.0	-0.4	0.2
2008												
I	2.5	0.3	1.0	0.3	-114.8	0.2	0.0	-0.1	0.4	-3.8	-0.5	0.5
II	3.1	0.5	1.5	1.0	-247.0	0.4	0.1	0.0	0.5	-4.0	-0.5	0.7
III	3.4	0.7	2.0	1.8	-384.4	0.6	0.3	0.1	0.8	-3.9	-0.6	0.9
IV	3.6	0.9	2.4	2.6	-510.4	0.8	0.6	0.4	1.1	-3.4	-0.6	1.0
2009												
I	3.4	1.0	2.4	3.1	-587.5	0.9	0.9	0.6	1.2	-2.8	-0.6	1.1
II	2.9	1.0	2.3	3.2	-597.0	1.0	1.3	0.9	1.2	-2.2	-0.6	1.0
III	2.4	1.0	2.0	3.0	-543.6	0.9	1.8	1.2	1.3	-1.9	-0.6	0.9
IV	1.8	0.9	1.6	2.4	-431.7	0.7	2.2	1.5	1.4	-1.8	-0.5	0.8

CHINA DIFFERENCE TABLE 1 SUMMARY TABLE.
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND- ITURE	REAL INVESTMENT	GDP	INDUSTRIAL OUTPUT	UNEM- PLOYMENT ESTIMATE (000s)	EMPLOY- MENT	AVERAGE EARNINGS	CONSUMER PRICE INDEX	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE PER DOLLAR	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF GDP!)
2007	0.0	0.7	-0.1	-0.3	384.1	-0.1	0.0	0.0	-0.1	-0.5	-0.4	0.0
2008	0.2	3.2	1.9	1.2	-3675.9	0.5	0.1	0.1	-0.2	-1.5	-0.1	0.1
2009	0.4	2.3	1.2	1.9	-3193.2	0.5	0.8	0.5	0.2	-1.1	-0.2	-0.1
2007												
I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	0.0	0.2	-0.4	-0.3	927.3	-0.1	0.0	0.0	-0.1	-0.1	-0.4	-0.1
III	0.0	0.6	-0.4	-0.5	1150.9	-0.2	0.0	-0.1	-0.2	-0.8	-0.7	-0.1
IV	0.1	1.8	0.4	-0.3	-541.9	0.1	-0.1	-0.1	-0.2	-1.1	-0.5	0.0
2008												
I	0.1	2.8	1.3	0.2	-2166.5	0.3	0.0	-0.1	-0.2	-1.4	-0.5	0.0
II	0.2	3.4	1.9	0.9	-3685.5	0.5	0.0	0.0	-0.2	-1.6	-0.2	0.1
III	0.2	3.3	2.1	1.5	-4296.4	0.6	0.1	0.1	-0.2	-1.6	0.1	0.1
IV	0.4	3.2	2.0	2.0	-4555.1	0.6	0.3	0.2	0.0	-1.5	0.2	0.1
2009												
I	0.4	2.9	2.2	2.3	-4831.5	0.7	0.5	0.3	0.0	-1.3	0.1	0.1
II	0.4	2.4	1.6	2.2	-3821.8	0.5	0.7	0.5	0.2	-1.1	-0.1	0.0
III	0.4	2.3	1.1	1.9	-2715.9	0.4	0.9	0.6	0.3	-0.9	-0.3	-0.1
IV	0.4	1.6	0.4	1.4	-1403.7	0.2	1.1	0.7	0.4	-0.8	-0.5	-0.2

EURO ZONE DIFFERENCE TABLE 1 SUMMARY TABLE.
(PERCENTAGE CHANGES FROM BASE ,UNLESS OTHERWISE SPECIFIED)

YEARS BEGINNING Q1	CONSUMER EXPEND- ITURE	TOTAL INVESTMENT	GDP	INDUSTRIAL OUTPUT	UNEM- PLOYMENT ('000S)	EMPLOYMENT	AVERAGE EARNINGS	CONSUMER PRICES	SHORT-TERM INTEREST RATE (PTS)	EXCHANGE RATE (\$/EURO)	CURRENT ACCOUNT (% OF GDP!)	GOVERNMENT BALANCE (% OF GDP!)
2007	0.2	0.1	-0.1	-0.2	32.3	0.0	-0.1	-0.1	-0.3	1.4	0.0	0.0
2008	0.9	0.9	0.5	0.4	-148.8	0.1	0.0	-0.3	0.0	2.5	-0.2	0.2
2009	0.5	0.8	0.4	0.7	-187.6	0.2	0.2	-0.1	0.8	1.3	-0.1	0.2
2007												
I	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	0.0	0.0	-0.1	-0.2	31.9	0.0	0.0	0.0	-0.2	0.7	-0.1	0.0
III	0.2	0.0	-0.2	-0.4	62.2	0.0	-0.1	-0.1	-0.5	2.4	0.0	0.0
IV	0.4	0.2	0.0	-0.3	35.0	0.0	-0.1	-0.1	-0.4	2.3	0.0	0.0
2008												
I	0.7	0.5	0.2	-0.1	-31.6	0.0	-0.1	-0.2	-0.3	2.6	0.0	0.1
II	0.9	0.8	0.4	0.3	-116.8	0.1	-0.1	-0.3	-0.2	2.8	-0.1	0.2
III	1.0	1.1	0.6	0.7	-198.2	0.1	0.0	-0.4	0.1	2.6	-0.2	0.3
IV	1.0	1.2	0.7	0.9	-248.6	0.2	0.1	-0.3	0.4	2.1	-0.3	0.3
2009												
I	0.9	1.2	0.7	1.0	-251.9	0.2	0.2	-0.3	0.7	1.8	-0.3	0.3
II	0.7	1.0	0.5	0.9	-222.0	0.2	0.2	-0.2	0.9	1.5	-0.2	0.3
III	0.4	0.8	0.4	0.6	-170.6	0.1	0.3	-0.1	0.9	1.1	0.0	0.2
IV	0.2	0.4	0.2	0.3	-105.7	0.1	0.3	0.1	0.9	0.9	0.0	0.1

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