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Saving and Investing in America

by

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Summary

In this paper we will consider issues relating to the historically low US saving rate and the large current account deficit. The approach is meant to be pedagogical, with an emphasis on clearly illustrating mechanisms behind these developments such that the readers more easily can make up their minds about what the future is likely to bring.

The conclusions of the paper are as follows: Even though there are explanations indicating that the US currently should run a current account deficit (see especially Section 4), the tides must eventually turn. Issues relating to long run sustainability make clear that the US trade deficit must eventually be reduced in order to avoid a crisis in the future. This means that the relative price of US produced tradable goods will have to decline, and this will take place through a further depreciation of the US dollar. This depreciation does not have to be especially damaging for the global economy, but this seems to require that East Asian countries collectively allow their currencies to appreciate against the US dollar. A revaluation of the Chinese currency, the Renminbi, is key here.

The paper is organized as follows: Section 1 presents the basic data relating to the two intimately releated issues of the US saving rate and current account deficit. In section 2 the relationship between the saving rate and the current account is formalized, and we consider the various ways in which an understanding of the forces behind developments in the current account can be achieved. Section 3 looks more specifically at explanations of the low personal saving rate, and tries to evaluate how critical the situation is. Section 4 considers the effects of global demographic developments on international capital flows.In section 5 we will look at more theoretical approaches to the current account. These give us a clearer understanding of underlying forces behind the current account. Section 6 takes a closer look at requirements for long-run sustainability. Section 7 concludes.

1) Introductory Remarks: The US Current Account Deficit and Low Saving Rate

Rarely has the world seen capital flow so whole-heartedly to one single country as it has been doing to the US over the past years. After being fairly balanced in the early 1990s, both the trade balance and current account have moved into deep deficits never seen before in the post-WWII era. Currently both of the deficits are greater than 5 percent of US GDP. The path of the current account from 1960 to 2004 is shown in Figure 1 below. The balance of trade looks very much the same, as net factor payments are small relative to the trade deficit.

These deficit levels have never been experienced before in the US, at least not since the late 1800s. Typically these deficit levels are associated with currency depreciations, reduced consumption and imports, and reversals or at least reductions of the deficits. The importance of the deficits is due to how a reversal might negatively affect the world economy through reduced US import demand and rapid swings in asset markets (further depreciation of the USD, higher interest rates, and lower US securities prices).

USA Current Account Balance, % of GDP (1960-2004
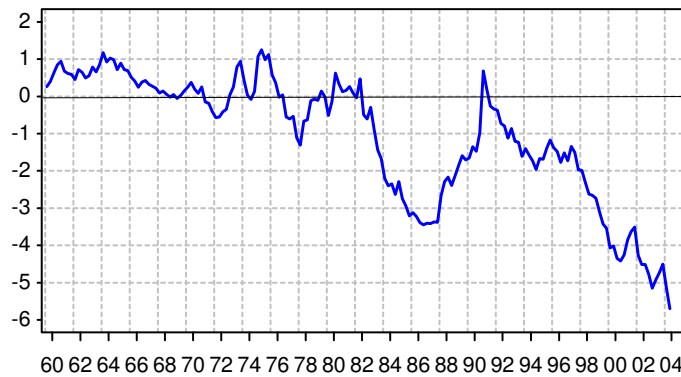
Source: EcoWin

Figure 1: The US Current Account as a Percentage of GDP

The present level of the US current account deficit implies that foreigners are financing net US international purchases of more than 1,5 billion USD every single day. As long as they are willing to do that, everything is fine. The only thing that happens is that these foreign investors are accumulating a large amount of US assets with the accompanying claims on the future returns on these assets. This implies that US households to a lesser degree will own their own future production, as they are selling claims on this in order to increase consumption today.

The US trade deficit has exploded not due to a particular lack of demand for American export goods, but rather due to a consistently higher growth rate in US imports. Figure 2 graphs the imports and exports series as shares of US GDP. Over the past decade, exports from the US has grown at approximately the same rate as GDP, while imports have grown considerably more rapidly.
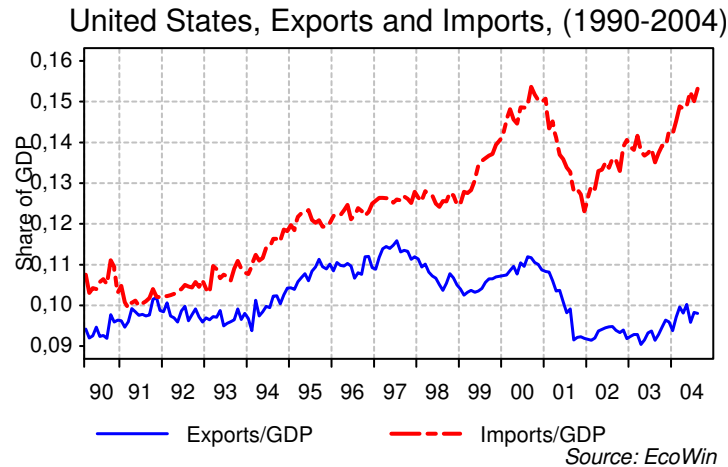
Figure 2: US Imports and Exports as Shares of US GDP

In Figure 3 we more clearly see the consequences of this rapid growth in imports relative to exports. Whereas the values of exports and imports were approximately equal in the early 1990s, the value of imports is now more than 50% higher than that of exports.

Note, however, that this relative difference between the value of imports and exports was just as big in the mid 1980s as it is today. 20 years ago this imbalance was reversed largely by a steep fall in the value of the US dollar. The US real exchange rate depreciated by around 30% between 1985 and 1988. Within one year after the USD started its decline, the imports-exports ratio started falling.

This time around, the real USD has once again depreciated. From its peak in 2001, the USD has as of November 2004 depreciated by between 15% and 20%. However, the imports-exports ratio has continued its march upward.
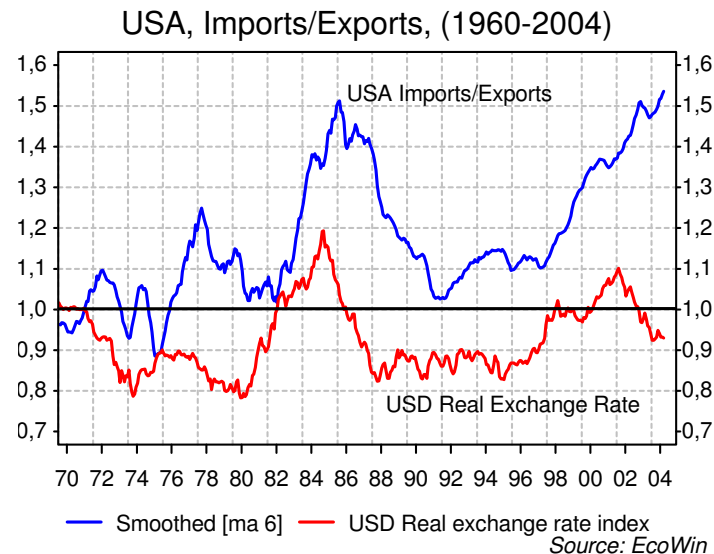
**Figure 3: The Imports-Exports ratio versus the USD real exchange rate**

While Americans presumably have been busy enjoying their purchases of foreign goods, something quite special has been happening with the saving rate in the US economy. Traditionally, many countries have had a higher saving rate than the US, but the rate at which Americans currently save is lower than ever before.

There are several interesting varieties of saving rates we could look at. Figure 4 shows the national and private saving rates net of depreciation of capital. National savings is given by personal savings + corporate savings + government savings, while private savings is given by personal savings plus corporate saving. From Figure 4 we can see that the private saving rate generally has been higher than the national saving rate over the past two decades, as the US government has run deficits. We can also see that there has been a general downward trend in US savings over the past four decades.

USA, Net savings (after depreciation of capital)

Source: EcoWin
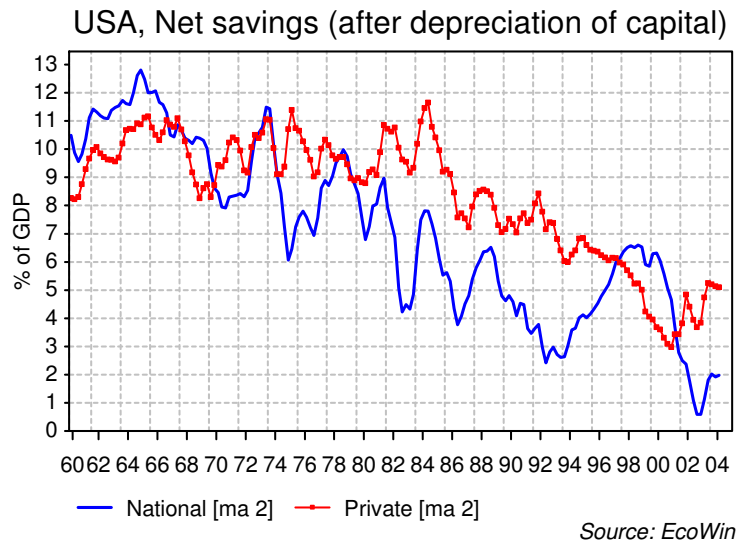
Figure 4: US Net Savings Rate, National and Private

Figure 5 shows the time series of the households' saving rate. By the early 1990s, many economists were worried that Americans were saving too little. The past decade has not given them much comfort in this respect. Savings by American households, given by disposable income minus consumption, are currently close to zero.

United States, Personal Saving, Rate, SA, USD

Source: EcoWin
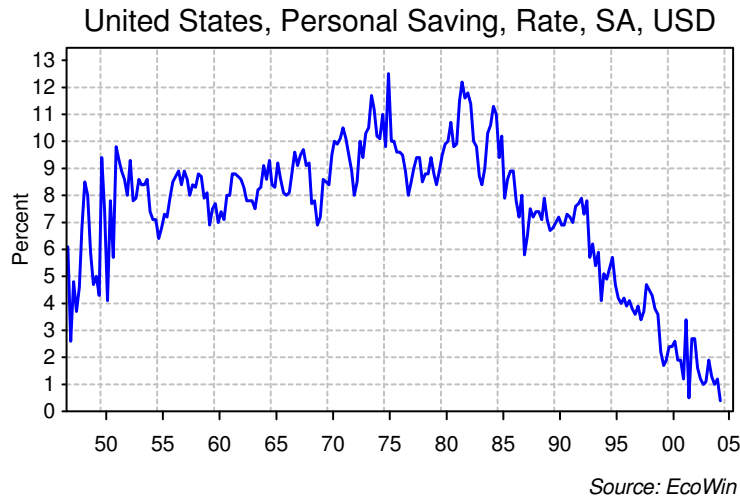
Figure 5: US Personal Saving Rate

The purpose of this paper is to analyze these two trends in the US economy – the large current account deficit and the low saving rate. First, we will spend some time trying to realize that these two aspects are closely related, and that the reversal of one will not come about without a reversal of the other. We will then focus on whether the gradual weakening of the US international investment position is sustainable in the long run. To some extent, of course, this hinges on whether the current development is due to sound policies by governments and households at home and abroad. Therefore, it is critical to see whether we can rationalize both the current account deficit and the low saving rate. Finally, the paper concludes with a discussion of some plausible scenarios for the future.

2) Analyzing the Current Account Deficit

Current accounts and trade balances can by analyzed and understood in different ways. From one angle it seems clear that domestic demand drives net exports, while one from another angle wonders whether it is the portfolio decisions of domestic and foreign investors that are the causes. When one thinks more closely, one realizes that these two perspectives must be interconnected: US residents will only be able to spend more on imports than they earn from exports if foreigners are willing to accumulate US assets. On the other hand, if US consumers are unwilling to buy more foreign goods, foreign citizens will not be able to accumulate more US assets.

Let us be more concrete. There are three different ways in which current accounts can be analyzed:

i)   By using a domestic perspective based on national income and product accounts,

ii)   by looking on international trade flows in goods and services (plus net factor payments from abroad), and

iii)   by looking on international capital flows and holdings of international assets.

We will go through these step by step. Note that we in this part will focus on the data, without being particularily theoretic. We will get back to a more theoretical approach when we look at the sustainability issue below.

2.1) National Income and Product Accounts

The current account is inexorably linked to the saving and investment decisions made by private individuals and the government. In order to show this, note that a nation's Gross National Product (GNP) can be described in the following manners:[1]

$$Y = C + I_p + G + NX + NFP$$

$$Y = C + S_p + T + Tr,$$

where $Y=GNP$, $C=$ private consumption, $I_p=$ private investment, $G=$ government purchases of goods and services, $NX=$ the trade balance, $NFP =$ net factor payments from abroad, $S_p=$ private saving, $T=$ taxes, and $Tr =$ transfers abroad (for instance foreign aid). The first relation says that GNP equals the sum of income derived from producing goods and services, while the second says that GNP equals the amount of income of each individual in all its uses. Income can only be consumed, saved, paid to the government or transferred abroad.

By equating the two relations, we get that

$$(S_p - I_p) + (T - G) = NX + NFP - Tr = CA.$$

This means that the current account (CA) equals the government budget balance plus the gap between private saving and investment. Currently, US private saving is lower than investment, and the government runs a deficit. Thus, simply using this

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[1] Note that GNP = GDP + NFP

accounting relationship, we can know for sure that the US will also have a current account deficit.

In order to show how this relates to the accumulation of foreign assets, we first note that a dollar of saving can be spent on physical capital, currently issued government debt (which is equal to the government deficit), or on foreign assets (*FA*):

$$S_p = I_p + (G - T) + FA,$$

which means that

$$FA = (S_p - I_p) + (T - G), \text{ or}$$

$$CA = FA.$$

Hence, the current account shows the change in a nation's holdings of foreign assets. This means that when a country runs current account deficit, it's so-called net international investments position weakens. From Figure 6 below, we can clearly see how the current account deficits have translated into a considerably negative US net international investment position (NIIP). Below we will look more carefully at the NIIP, especially its relation to the long-run sustainability of US deficits.
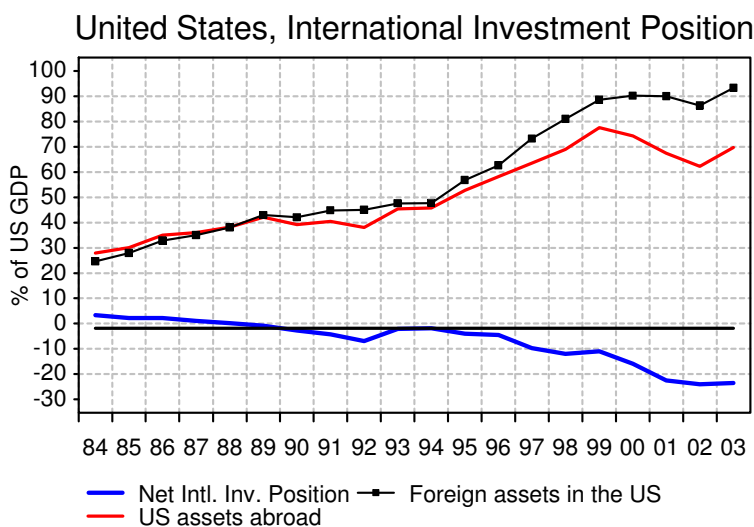

Source: EcoWin

Figure 6: The US Net International Investment Position (NIIP)

All this means that both low levels of private saving relative to investment and government budget deficits lead to current account deficits. During the late 1990s and early 2000s low private saving rates combined with relatively high investment rates contributed to the current account deficits. Currently the story is largely that the government is running large budget deficits in order to stimulate the economy, while investment rates have fallen to moderate levels. As consumption has continued growing at high rates as a consequence of low interest rates, tax cuts and transfers, and the Ricardian equivalence result not holding (perfectly), the current account deficit has widened even though investment rates have declined relatively to its peak in year 2000. This means that we are back in a situation with twin deficits. This is a less enviable situation than the one we had only a few years ago, when foreigners finance new

investment. As the US government has to issue debt and thereby compete **for saving by bidding up interest rates, less of the foreign financing can go into new investment.**

USA, Saving and Investment (1990-2004)
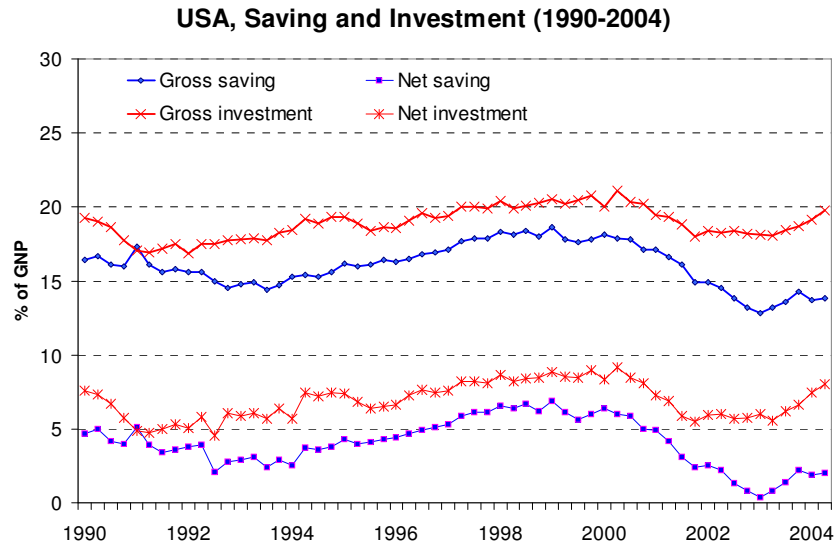
Figure 7: US Saving and Investment Rates (Source: BEA)

Figure 7 above shows us that the current net national saving rate has recovered somewhat after its low in 2003. This low saving rate tells us that Americans, through their own savings, are barely able to replace its depreciating capital stock. They are counting on foreigners to assist them in building up the aggregate capital stock in order to equip their workers with enough capital. The net and gross investment rates tell us that the investment levels are moving back towards the high levels of the late 1990s, especially when considering the phase of the business cycle. Net investment rates always drop during recessions. We should note that current net investment levels contribute to a substantial capital deepening. If we let annual productivity growth be at 2-2,5 % and labor-force growth equal 1-1,5%, net investment levels in the region 3-4% of GDP will keep the ratio of capital per effective labor constant. Current investment rates are considerably higher than this.

This preliminary analysis tells us the following:

i)   While investment rates are high, Americans are not currently saving enough themselves to increase or even preserve the level of the capital-labor ratio.

ii)   Foreigners' willingness to hold US assets is an important factor for improving the potential of the US economy, as it is necessary to equip US workers with capital.

iii)   If the foreigners' willingness to increase their holdings of US assets dampens, a substantial increase in the US (national) saving rate (2,5-3,5% of GDP) is necessary to preserve the level of capital per effective worker. This means that consumption-led growth will be impossible to obtain during this period.

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2.2) Trade flows

This perspective focuses on the factors that drive export and import flows. Contrary to the first perspective, where the economies other than the one under discussion are absent, a direct role is now given to them through foreign demand for goods and services.

A well-known fact about GDP data and US trade data is that the US income elasticity of imports is considerably higher than the non-US income elasticity of imports from the US. This means that with equal GDP growth rates in the US and the rest of the world, the US will increase its imports relative to its exports, and the trade and current account deficits will continue to widen.

Below you can see an illustration of this point. In the figure you can find the scatter plots with the associated simple regression lines for non-US GDP growth & and US exports growth, and US GDP growth & US imports growth. The data is collected from IMF and covers the period from 1970 to 2002. Non-US GDP growth has been estimated by assuming that the US contributed to 25 percent of world GDP growth. As IMF provides data for world GDP growth, non-US GDP growth is then implicitly given by:

$$0,25g_{us} + 0,75g_{non\text{-}us} = g_{world}.$$

What we find is a regression line that tells us that the level of US imports growth is higher than that of exports growth for all GDP growth rates (in the sample). However, in this simple regression this is not due to a higher import elasticity, but rather due to a larger constant in the estimated regression line. In fact, the exports elasticity with respect to foreign GDP growth is marginally higher than the imports elasticity. Whatever method we use, for equal growth rates in the US and elsewhere, the US trade and current account deficits will continue to widen due to higher growth in imports than exports.
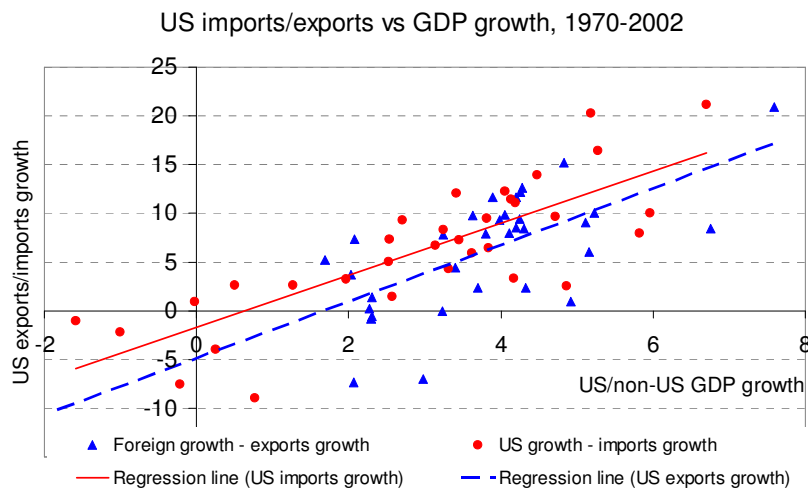
Figure 8: Growth Rates in US imports and exports relative to US GDP growth and foreign GDP growth, respectively. (Sources: IMF, Ecowin)

Much research has been devoted to clarify this asymmetry. Some researchers have pointed out that demographic variables might be of importance. For one thing, an

increase in immigration might cause deficits, as immigrants maintain their tastes for the home products for a long time, and also send part of their wages back to their home country. Further, the consumption profile of young and old persons differs. Specifically, the elderly consumes a relatively larger share of domestic services, primarily due to their demand for health services. Hence, we would expect that countries with a relatively young population to import more than countries with relatively old populations. As the US population is relatively younger than for instance that of Japan and Western Europe, this might partially explain the trade imbalances.

We should also note that the services exports elasticity w.r.t. foreign income is in fact larger than the services imports elasticity w.r.t. US income. Further, the US services trade balance is in positive territory. This means that as the share of services in world trade grows and as the non-US part of the world grows richer and increase their relative demand for services, the US trade deficit might decline.

Of course trade flows are to a great extent determined by relative prices at home and abroad. We have already seen how the US current account balance swings with the US real exchange rate, and increases and decreases in the deficit can be traced back to movements in the real USD exchange rate. However, our main problem is what seems to be an equilibrium US current account deficit. Even though USD appreciation during the latter half of the 1990s contributed to an increase in the deficit, this cannot explain why the deficit already was considerable before the real USD started to appreciate. In the next section we will attack the problem with the current account deficit from a quite different perspective. This might show us how the deficit can be rationalized.

2.3) The Balance of Payments: Current Account = (-)Capital Account

It is worth pointing out that an entry in the current account always has its counterpart in the capital/financial account of the Balance of Payments Accounts. If an American importer of cars buys a Volkswagen (and the purchase is made in USD), the German seller of the car will have an increase in USD holdings. As long as he or another German does not import something from the US for an equal amount, the dollars must somehow show up as a capital inflow into the US. Either the seller will buy US assets himself, or he will trade them in with another German who invests the USD in some tangible or liquid US asset. If these were the only transactions during some period, the US would have run a current account deficit, with the flip side of the coin being that foreigners financed the deficit by increasing their claims on the US.

However, we can also look at the current account deficit from the opposite angle. Let us assume that the Germans save more than they invest, and that the German government budget is balanced. The Germans find US assets the more attractive relative in face of the expected risk-return tradeoff, and they accumulate US assets equivalent to the amount $S - I$. The euros are traded in for USD, which then buy the Germans some US assets. Now Americans have increased their holdings of euros, and they have the choice either to import goods or services (which can be used for consumption or investment) from the EMU, or they can use them to buy euro-denominated assets. Unfortunately, Americans find the latter relatively unattractive, and they desire to keep the share of domestic capital high relative to total wealth. Therefore the euros are used to buy capital or consumption goods from the EMU. The

net effect is as before a US current account deficit and a financial account surplus (capital inflow). This means that relative attractiveness of US assets can be an explanation of the US current account deficit, and we can analyze it from the perspective of the international capital market and relative rates of return. Further, the inflow of capital to the US means that the demand for USD increases, and in a period where the sentiment shifts toward US assets we can expect to see a concurrent strengthening of the USD, and a weakening of the current account.

Below you can see the US Balance of Payments accounts of year 2000. Except for statistical problems, we see that the counterpart of a current account deficit is a financial+capital account surplus, or in other words, a capital inflow.[2]

Seeing the current account deficit from this perspective allows us to see more clearly how the level of the deficit is determined by the sentiment and expectations of foreign investors. One might say that the deficit is only as large as it is because foreign investors have made it so, alternatively that they have allowed it to reach these levels.

| US Balance of Payments Accounts, 2000 ($ billion)		
Current Account	Credits	Debits
1) Exports	+1069.5	
2) Imports		-1438
3) Net factor payments		-13.7
4) Net unilateral transfers		-53.2
Balance (1+2+3+4)		**-435.4**
Capital Account + Financial Account	Credits	Debits
5) *Capital Account* (nonmarket transfers)	**+0.7**	
Financial Account		
6) Increase in US assets held abroad, of which		-553.3
Official reserve assets		-0.3
Other assets		-553
7) Increase un foreign assets held in US, of which	+952.4	
Official reserve assets	+35.9	
Other assets	+916.5	
Balance (6+7)	**+399.1**	
Statistical discrepancy	**+35.6**	

Figure 9: A snapshot of the US balance of payments account (Source: BEA)

The bias towards US assets in all investors' (US and foreign) portfolios can be rationalized in several ways. First, we had the new-economy euphoric climate, where the US economy was praised as never before. High expectations created huge capital inflows. Later, we had the bursting of the global new-economy bubble. GDP growth and corporate profitability have declined in most of the rich countries, and risk aversion has increased. US assets have been regarded as relatively safe, and the effort by fiscal and monetary authorities has been more aggressive than abroad. With a glimmer of hope for a rebound in economic activity, investors have continued to have a preference for US assets.

Are the expectations of higher risk-adjusted returns justified? Should Americans be net short in foreign investments? If so, we have to explain the following figure, which shows that the US returns on aggregate foreign assets in all years since 1976 have been

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[2] The statistical discrepancy could be due to basic reporting problems, but a likely source is that recipients of factor income from abroad have incentives to hide it from the government (due to tax avoidance), while those who make the factor payments have incentives to record them.

higher than the foreigners' returns on US assets. We also see that the volatility in US returns on foreign assets does not seem to be considerable higher than the foreign returns on US assets (in fact the standard deviations of returns on assets are exactly the same, at 1,3%).[3]

(Nominal) Return on total foreign assets, 1976-2001
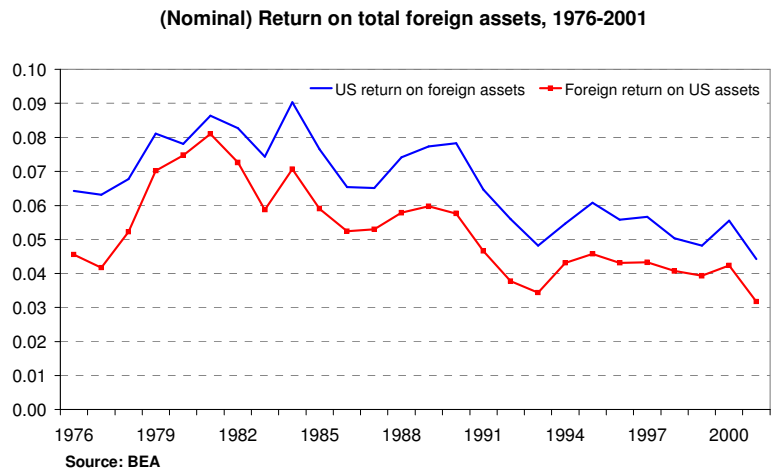
Source: BEA

**Figure 10: Return on international investments (Source: BEA)**

The structure of investors' portfolios has a deep impact on the current account balances of countries, and a shift away from US assets in these portfolios will cause a decline in the US current account deficit, higher US interest rates, a fall in stock market valuations, and a drop in the value of the dollar. In this context we would also want to take a look at how the foreign investors and governments finance the US current account deficit.

How are the foreigners financing the US Current Account deficit?
The general picture is that European countries invest in stocks and corporate bonds, while Asian countries largely invest through the central banks and accumulate US Treasuries. Whereas the accumulation by the private sector dominated a few years ago, accumulation by foreign governments is now at least as important as private accumulation. Figure 11 below shows this development. As we will discuss more below, this implies that the degree to which Asian governments feel that they have to intervene in the currency markets will to a large extent control the destiny of the USD.

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[3] Parts of the explanation is the low rates of return earned by foreign companies in the US, see Mataloni (2000). He finds that the return on assets of foreign-owned companies in the US have been 1 to 2 pp lower than that of their US counterparts. Explanations are startup costs and low market shares.

The Financing of the CA Deficit: Private or Official Buyers of US Assets? (1998-2004)
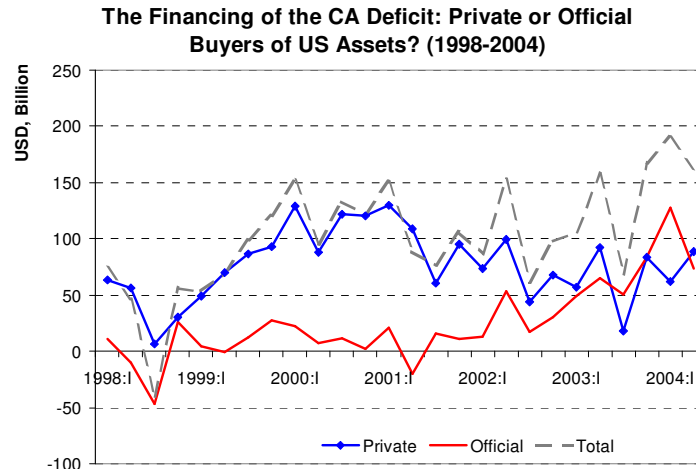
Figure 11
(Source: BEA)

Net stock purchases have plummeted over the past few years, and is currently at a level around zero. This shift from private stock investments to government accumulation of US Treasuries could be an important signal. The low saving rate is by some analysts partially justified due to high future productivity growth and return to capital. However, it seems like foreigners find US stock prices expensive in both absolute and relative terms. If the foreign investors are right, then this rationale for lower current savings is less credible.

Net Purchases of US Stocks by Foreign Residents (1998-2004)
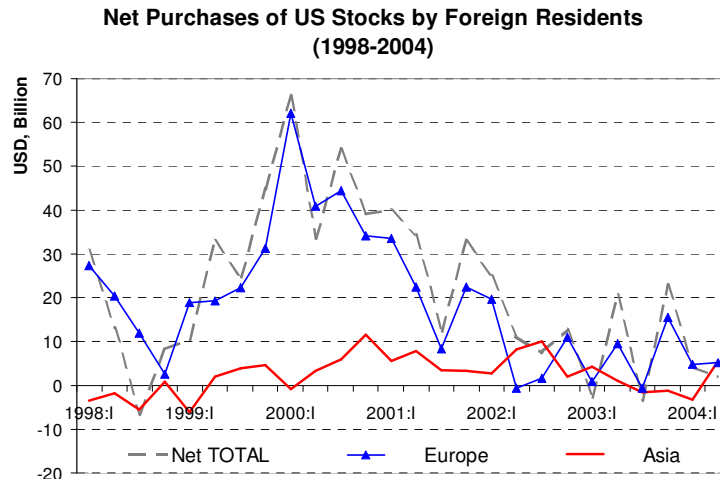
Figure 12
(Source: BEA)

Corporate bonds have generally been, and are currently, an important element in the financing of the deficit. Relative to stocks, corporate bonds have been more important in all recent years, except in the year 2000.

Asian countries channels net export revenues back to the US primarily through central bank currency interventions. Asian countries are running large balance of payment surpluses, while also having positive current accounts. This indicates that private

individuals in Asia to a lesser extent purchase US assets, and instead leave that responsibility to the central banks. Out of the total foreign official assets in the US, Asian countries account for 75 percent. Asian countries are engaging in these interventions to avoid seeing their currencies appreciate relative to their neighbors'. This means that relatively weak currencies toward the USD give net export surpluses toward the US. The USD export income is then recirculated into the US through currency interventions. This could be an important factor putting a floor under the dollar.

This process is also what makes a Chinese revaluation potentially so important. Since the renminbi is pegged to the USD, all else equal, a depreciation of the USD makes Chinese exports more competitive relative to those of other East-Asian countries. To avoid this negative effect on its tradable goods sector, these countries have been intervening in the foreign exchange markets to reduce the upward pressure on the value of their currencies.

A revaluation of the renminbi would reduce the need of these interventions, and it would be less costly to let the currencies appreciate against the USD. This would also take much of the pressure off the Euro, as it would be easier to achieve a more balanced depreciation of the trade-weighted US real exchange rate.

Accumulation of US Assets by Foreign Governments (1998-2004)
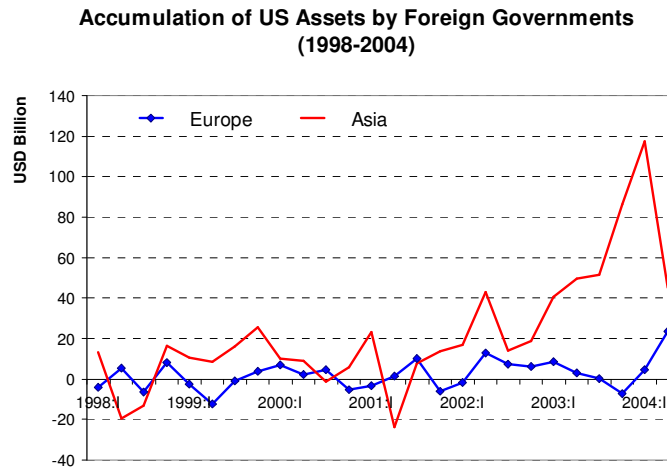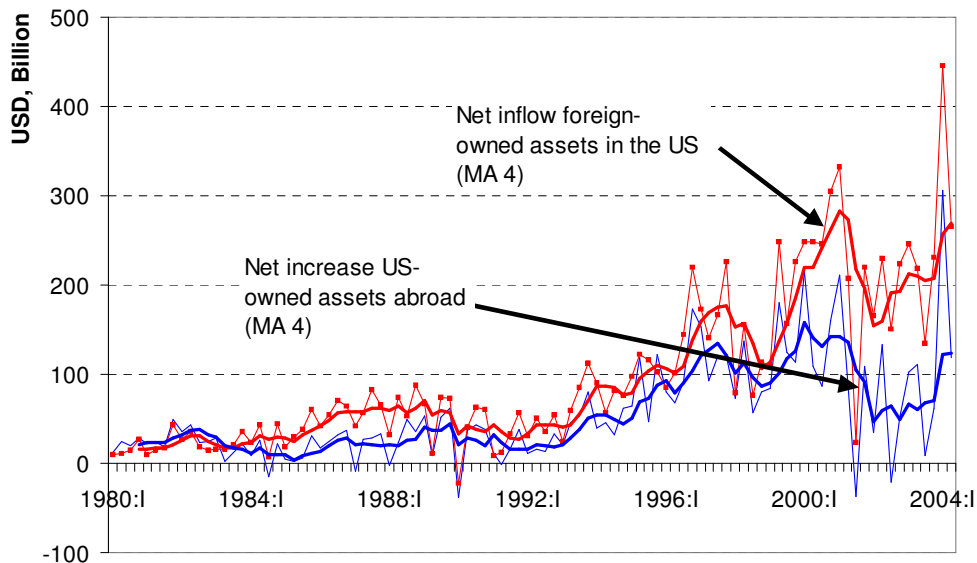

Figure 13
(Source: BEA)

Foreign Official Assets in the US by end of 2Q, 2004
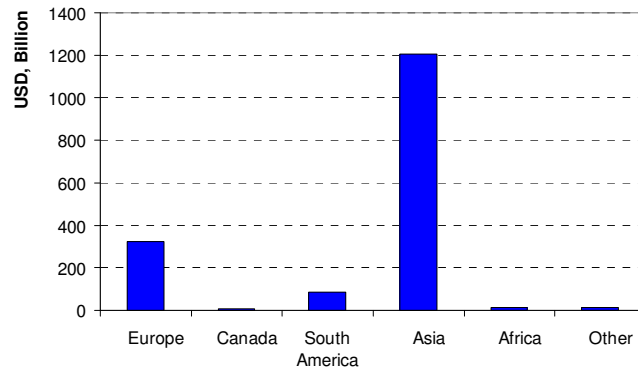
Figure 14
(Source: BEA)

- Up until recent months, the financing of the US current account deficit over the past few years was as much about a deceleration of the speed in which Americans make investments abroad as it was a story about foreigners wildly accumulating US assets. Over the past few years, foreigners have not accumulated US assets at a faster rate than they did around year 2000. Rather, Americans have been less willing to continue making investments abroad, and the combined development has made the financing of the deficit possible. This could be taken as a sign that while foreigners have wanted to accumulate USD assets in the previous turbulent years, Americans have spent rather than invested the foreign exchange it has received. As the global economy has picked up some momentum, it seems like Americans again are getting more willing to hold assets outside their own territory. This could add to the downward pressure on the USD.

Net flows: US assets abroad and Foreign assets in the US, nominal USD, (1980 - 2004)

Figure 15: International investments flows – to and from the US (Source: BEA)

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3) Analyzing the Saving Rate

We have now approached the US Current Account deficit from several different angles. The accounting approach points to the low US saving rate. The trade-flows approach points to the reason why Americans import more than foreigners import from the US, while the capital-account approach points to the relative expectations of US and foreign investors with respect to returns at home and abroad.

In the following section, we will look at explanations for the low US saving rate. No matter how you approach the current account, the US saving rate is important, since ultimately, it is the difference between the domestic investment and domestic saving that tells us how much foreign capital is needed.

Except for the UK, whose gross saving rate has had a remarkable simility with its US counterpart, most rich countries have a substantially higher saving rate than does the US (for a sample of countries, see Figure 16 below). Especially when one takes a look at the personal saving rate, the Americans seem to think alarmingly little abount their future welfare. However, note that there has been a downward trend in the saving rate in many countries.

Gross Saving Rate (% of GDP), Various Countries (1960-2002)
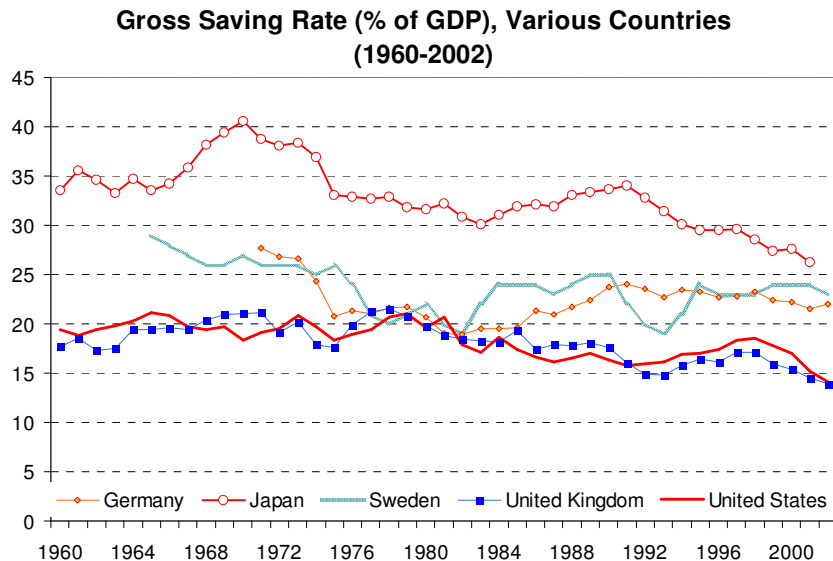
Figure 16: Gross saving rate as a percentage of GDP, various countries (Source: WDI)

Many economists have for a long time been trying to understand why the Americans are saving so little. Here I will go through some attempts to explain this, and I will also consider other developments that one would think have affected the saving rate. I will not focus much on trying to validate these claims, since in the end, a more powerful and simple explanation seems to be available. However, the explanations below are undoubtedly an important part of the picture. Finally, before we go on, you should recall that the path of the personal saving rate (Figure 5) is much more dramatic than that of the national saving rate. Since it is the national saving rate that in the end is what affects the budget constraint of the households, things are not as bleak as the personal saving rate indicates.

- The growth of Social Security has given Americans more **annuitized retirement saving**. Since this reduces the need for precautionary saving due to uncertainty of time of death, one would expect aggregate saving to decline.
- The US social security system has been a traditional **PAYGO system**, where current workers pay for the retirees pensions. Since retirees receive pensions from current production rather than from their own past savings, less saving is needed. This is especially so if the agents in the economy trust the sustainability of the system.
- Over the past decades we have seen a considerable **improvement of credit markets**. This reduces the need for precautionary/buffer saving, since better credit markets insure you against temporarily adverse shocks. In other words, there is less need to save for a rainy day. One would expect that improved credit markets would make revolving debt (e.g. consumer credit with flexible repayment schedules) increase fast relative to non-revolving debt (i.e. closed-end loans such as car loans). The data support this: During the 1990s median outstanding debt grew by 70%, with revolving debt (that is, debt with flexible repayment schedules, for instance credit card debt) growing most rapidly. However, whereas one would expect non-revolving debt to be less procyclical than other debt, since presumably it should to a greater extent be used to smooth consumption when time are bad, this is not the case (see Maki, 2000). One is tempted to conclude that improved credit markets have reduced savings, but that consumers are not exploiting the markets as well as they could.
- Economic agents are most often modeled as rational individuals with perfect self-control. However, if we instead assume that at least a substantial share of the population have time inconsistent preferences giving a bias towards present consumption, we would expect improved credit markets to reduce savings. This could also explain why the new credit is not used to smooth consumption as much as one would expect perfectly rational individuals to do. For more on **time inconsistency** and hyperbolic discounting, see Laibson (1997).
- One of the most spectacular developments in the US society over the past decades is the **rise in inequality**. How might this affect the saving rate? The qustion of how idiosyncratic risks and imperfect credit markets affect the saving rate in general equilibrium was first analyzed in Aiyagari (1994). He found that larger and more persistent shocks (which cause inequality to rise) makes the saving rate larger. This is because of higher precautionary saving. Others have tried to reformulate the Aiyagari model to replicate the data on income and wealth data even better, and all of them find a significant positive effect of inequality on the saving rate (see, e.g. Gruber and Martin, 2003). However, I think one should be rather cautious in interpreting these results, and not conclude that inequality surely affects the saving rate positively. One should be aware that the process causing inequalities in these models is quite limited. Basically, all persons in the economy are subject to the same stochastic income/productivity process. One could say that all persons basically are born equal, facing the same structure of risks and opportunities. If one alters the structure of shocks such that groups of individuals face different processes of risks and opportunities, the results might change considerably.

- **Reduced saving for bequests**. Even though American birth rates are high compared to European, they have fallen. Thus each future retiree has on average fewer kids that will receive bequests, and this might reduce the saving rate. However, this can hardly be a major factor, because then Europeans should also have decreased their rate of saving substantially.
- **Optimism** about future productivity growth, and thus income growth. In the early 1990s, before the boom in technological growth due primarily to investments in IT, one speculated that lower technological growth was the cause of lower saving rates, since the lower rate of technological growth implied that less investment were needed to preserve the long run capital per effective worker. However, now the story has changed, since the productivity growth in the US has switched to a higher momentum over the past decade. Expectations of higher productivity growth could reduce the saving rate due to consumption smoothing motives. Some of the higher future income is spent on consumption today, and the excess of investment over saving is borrowed from abroad.
- **Demographic change**. A large cohort of baby-boomers is moving towards retirement. Individuals in this cohort should according to the life-cycle hypothesis be accumulating assets in preparation for old age, and should increase aggregate saving.
- **Earlier retirement** and longer expected length in retirement should also increase savings in the run-up to retirement.

So, where do all of these explanations leave us? First, we should note that most of these factors apply to all rich countries. PAYGO systems exist in Europe as well as in the US, credit markets have improved not only in the US, people are getting older in the entire OECD area, and technological developments affect not only income opportunities among Americans. Even though saving rates have declined in other countries as well as in the US, we still have not identified the factor making the US saving rate lower than the others'.

There are two ways to approach this. First, we could ask whether there are general equilibrium effects that we have ignored that might affect the US saving rate negatively. All the considerations above have a partial equilibrium flavor to them, and it might well be that things change a bit when we try to get a more complete picture. Indeed, this is the case, and we will focus more on this below, when we show how global demographic developments turn out to reduce US savings temporarily relative to those of other countries. The second approach is to be more critical when deciding upon the relevant definition of the saving rate. This also makes matters look quite differently. We will turn to this now.

The saving rate we have looked at so far is the NIPA (National Income and Product Accounts) saving rate. It is defined as the ratio of personal saving to disposable personal income. Disposable personal income is defined as personal income (including wage and salary income, net proprietors' income, transfer payments less social insurance, income from interest and dividends, and net rental income) less tax and nontax payments to governments. However, when we look at households' optimization problems from a theoretical standpoint, one important factor is included which is left out from the NIPA saving rate. This factor is capital gains on existing assets. Thus, when considering only the NIPA saving rate, we ignore the most

important fact affecting the annual changes in the expected net present wealth of a household. Further, the NIPA figure subtracts capital gains taxes when computing the disposable income, so in fact, capital gains exert a net negavtive impact on this measure of the saving rate. Several researchers have digged into the details of this aspect, and looked at how much of the drop in the saving rate can be explained by capital gains.

As an introduction, take a look at the figure below, which shows the path of an often-used statistic on the households balance sheet, namely the net worth of US households. We clearly see the effects from the stock market bubble. More important for us now, however, is the fact that the households' assets relative to debt, has been increasing more or less steadily as a share of disposable income for three decades. Thus, for all the fear of too little personal saving, the market value of the net worth of American households is at a very high level relative to disposable income.

If we also take a look at Figure 5 once more, we see that the periods that have corresponded to an increase in the net worth to disposable income ratio also have been characterized by a fall in the personal saving rate. As a robsutness check, we see that the saving rate was increasing between 1965 and 1975 when the household net worth was declining relative to disposable income. This implies that households seem to be adjusting their saving rate in response to changes in their total net asset position.

Household Net Worth, Percent of Disposable Income (1965-2004)
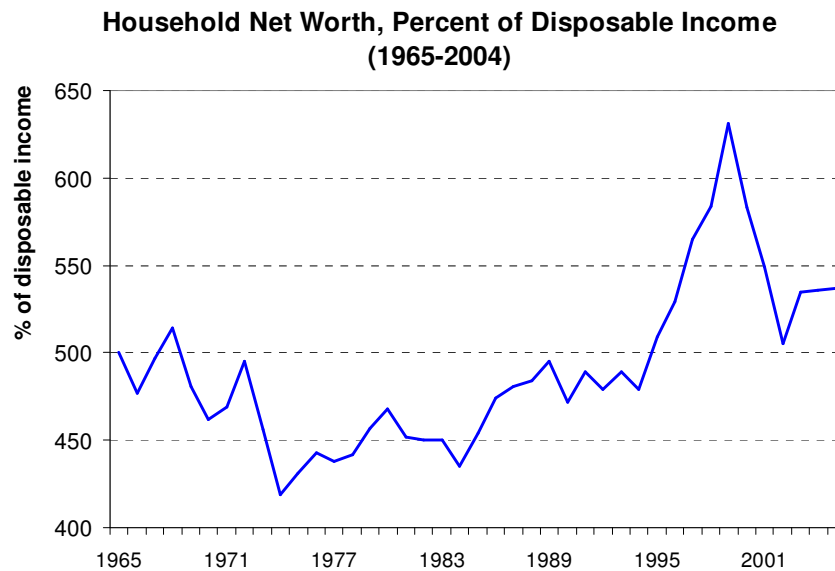
Figure 17: US Households Net Worth as a Percentage of Disposable Income
(Source: Federal Reserve, Flow of Funds Accounts)

When we want to estimate the effects of capital gains on the traditional NIPA saving rate, the approach is in theory straight forward: Estimate how much a dollar of capital gains adds to current consumption. This gives the percentage effect of capital gains on the saving rate, since saving equals disposable income minus consumption. The percentage change in consumption due to capital gains is usually called the wealth effect. For the stock market, this effect is usually estimated to be around 2-3 cents increase in consumption per dollar increase in stock market wealth. However, the estimates vary across time-periods, and is very hard to pin down. Further, there is a

problem of identification. The stock market leads economic activity, so it is likely that increases in stock market wealth causes consumption to increase not just due to the current increase in wealth, but also because stock price movements provide signals about the level and growth of future economic activity.

Thus, a connection between what one considers the wealth effect and a signalling effect. 1% of Americans own 53% of the stock market wealth. If there is a pure wealth effect from stock prices, then this 1% of the households would have to spend a great fraction of the wealth increase for aggregate consumption to respond by 2-3 cents. A study by Lusardi et.al (2001) finds that the marginal propensity to consume out of stock market wealth, is around 3-4 percent. Thus, it is more likely that stock price movements affects consumption to some part through the wealth effect but for most part through the signalling effect.

A general conclusion from several papers is that the effect of capital gains via the wealth effect on the saving rate has contributed to a substantial share of the drop in the personal saving rate. Lusardi et. al estimates that the wealth effect caused 40 percent of the drop in the personal saving rate between 1988 and 2001.
The exclusion of capital gains is not the sole accounting problem in connection with the NIPA saving rate. Accounting methods for contributions to and benefits from defined contribution pension plans can explain around one percentage point of the drop in the personal saving rate. For details, see Lusardi et. al (2001).
All in all, if we account for capital gains and adjust for asymmetric treatments in the NIPA defintion of taxes and pension contributions, it seems that well over fifty percent of the drop in the NIPA personal saving rate between the late 1980s and the early 2000s can be explained.

Should we then conclude that the NIPA saving rate, that stems directly from the national accounts, is irrelevant? The answer is that this measure of saving is highly relevant when it comes to whether the US is freeing up enough new funds for investment to increase the stock of capital. But it is a poorer measure when we want to look at how Americans are preparing for their old age, and more generally, whether they have a consumption pattern that is sustainable in the long run. Then net wealth levels are the important thing to look at, and then capital gains must be added to the NIPA saving rate in order to get a proper view of the financial situation of the households.

Is there no reason to worry, then? This is to stretch it too far. Several years have passed since the stock market collapse, and the net worth of US households, while still high, has dropped substantially relative to its level four years ago. At the same time, the personal saving rate has continued to decline. This indicates that some readjustment of the saving rate is needed. But the magnitude of this readjustment might not be as large as the NIPA measure of personal saving seems to indicate. Further, one should remember that corporate profits have grown very fast over the past few years, and the saving by the corporate sector is substantial. It does not really matter much whether firms save for the households or households save for themselves (as long as the firms don't waste the money!). So if we add the saving of the firms to the saving of the households we would see that the saving rate has rebounded, and that this rebound occurred just around the time of the hard landing in the stock market. Refer to the private saving rate in Figure 4 for the details.

4) A Demographic Explanation of the Current Account Deficit

So far we have the discussed the current account deficit considering mainly factors within the US. However, as often in economics, things can look different when we look at the general equilibrium. In this case, this amounts to having the entire world as the object of study, and the US as a (large) component in this object.

One of the more important trends affecting our economies these days is the demographic development. The proportion of people above 65 years of age is about to increase substantially all over the Western world. To some part this is due to increased longevity, but it is also due to the fact that large generations born after the second World War will soon move out of the workforce.

Our main question here is the following: It has been argued that saving rates should increase as the baby-boom generation moves towards retirement. The main argument is that these people are at a stage of the life cycle where the saving rate is at its highest. However, people should not be expected to increase their saving at all costs. If for instance all countries increase their saving, the return to capital and interest rates will fall. This means that present consumption is cheaper than before, and this will reduce the incentives for saving.

One of the main characteristics of the demographic trends among OECD countries is that Western Europe and Japan are aging more rapidly than the US. The projected trends are shown in figure 18 below. This figure shows the projected elderly dependency ratio, defined at the number of people above 65 years of age divided by the population between 16 and 65. We clearly see how the US will stay relatively young due to relatively high birth rates and (projected) immigration. Note that the uncertainty surrounding these projections is limited. First of all, birth rates are quite stable, so the uncertainty surrounding the estimated number of people born between now and 2034 (thus including those who will be of age 16 in 2050) is quite small. Further, many of those who will be alive in 2050 are already born, and if nothing special happens to mortaility rates we can be quite sure about the number of survivors in 45 years. Thus the major uncertainty stems from what kind of immigration policies the various countries will implement in the future. For now, we will just take these data for granted, and study what impact they have on global capital flows.

Projected elderly dependency ratio (1996-2050)

Source: US Bureau of the Census, International Database
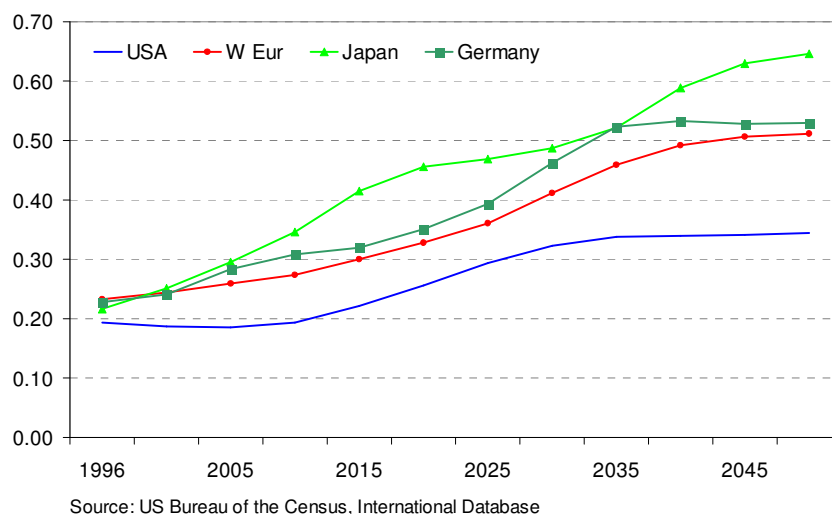
Figure 18 : The effects of demographic developments on the elderly dependency ratio

In models where we incorporate several regions of the world, the relative rates of aging between countries become important. We will now look at the results of a study by Cutler, Poterba, Sheiner and Summers from 1990. They analyze how we would expect different rates of aging to cause different reactions in the saving pattern in different regions, and hence in net capital flows. We have seen that the US is aging less rapidly than Japan and the EU. An anticipated aging of the population in an open economy causes savings to increase, and capital will flow from Japan and the EU to the US, pushing down interest rates in the US and other places. This will raise the wealth level (due to an increase in the present discounted value of future income) and cause an increase in consumption in the US. Thus what Cutler et. al find is that the saving rate in the US should drop between 1990 and the late 1990s, while investment would increase due to lower interest rates. Then, as the aging process in the US become more acute, the saving motive dominates over the consumption motive, and saving rates starts to increase, peaking around 2010. Investment rates will drop as large cohorts move out of the labor force, so for a given capital intensity in the economy, less investment is needed. Cutler et.al found the maximum negative effect on the current account to be around 1.5 % of GDP. The graph describing the numbers behind this story has been reproduced below.

USA net saving and investment rates, open economy
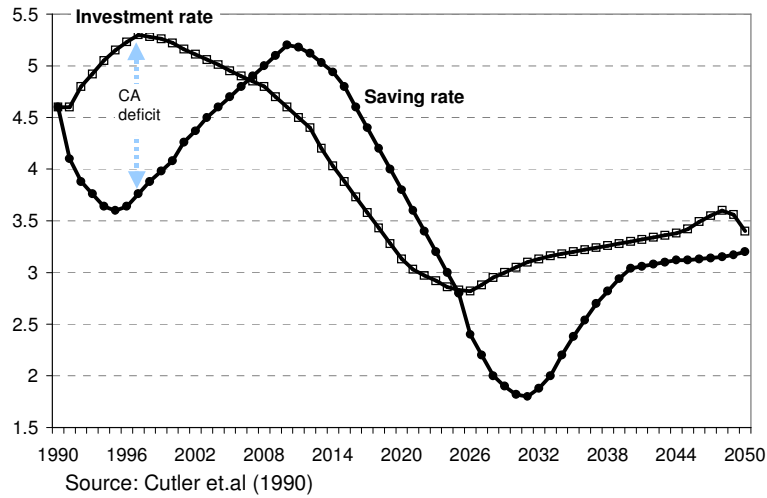

Source: Cutler et.al (1990)

Figure 19: Implications of global demographic developments on US saving and investment rates

Even though we should not put too much emphasis on the precise timing of these general equilibrium effects, the implication that saving over the short to medium horizon would decrease in the US is very interesting. What it says is that a substantial portion of the decline in the US saving rate can be justified simply as general equilibrium effects due to differences in demographic developments. Thus, the hypothesis that Americans are consuming too much and saving too little becomes less likely. At least, the degree of under-saving is not as high as one might have thought.

5) Theoretical Approaches to Current Account Deficits

Above we looked at the data to discover some of the trends that have created and sustained the large current account deficit in the US. The main message there was that the low saving rate relative to the investment rate created a demand for capital inflow from abroad. At the same time, foreign investors, be they private investors or governments, have seemed relatively happy to provide these funds. Still, we have not really looked at what the fundamental causes of current account deficits are according to economic theory.

Americans seem to save too little. Fine, but is this also what theory predicts that they should do? This is what we need to know if we want to make credible hypothesis about the future.

We will now take a brief look at two theories of the current account.

(i) The traditional neoclassical approach
The main theoretical attempt at understanding developments in the current account is called the intertemporal approach to the current approach (see e.g. Obstfeld and Rogoff, 1996). This theory is based on maximizing consumers and firms and perfect capital mobility. In the simplest deterministic setting for a small open economy where the interest rate is equal to the rate of time preference, we have the so-called fundamental equation of the current account:

$$CA_t = (Y_t - \tilde{Y}_t) - (I_t - \tilde{I}_t) - (G_t - \tilde{G}_t)$$

A benefit from living in an open economy is that the savings and investment decisions can be separated. Whereas savings have to equal investment in a closed economy, there is (with perfect markets) no restrictions on the relation between domestic saving and domestic investment in an open economy. The reason is that the rest of the world serves as an outlet for excess savings alternatively as creditors if investments are higher than savings.

Some of the implications of this fact are seen in the equation above. Characters with a tilde above it are the trend levels. Y represents GDP, I represents investments, and G represents government spending. Thus, what the fundamental equation says is that output above its trend level will strengthen the current account, while investment and government spending above their trend levels will weaken the current account. There is a common reason for this, and the reason is that consumers want to smooth consumption over time. Thus, if their income is temporarily high, they will save much of it. For a given level of investment, this will lead to more saving than investment, and these funds will be invested abroad. Further, if investment and government spending rise above trend, there are not enough resources for everyone given a constant level of output and consumption. Thus, to satisfy the demand, more goods will have to be imported. The foreigners are compensated by getting US assets, and the current account weakens.

Let us try to apply this equation to the situation that characterized the US during the late 1990s. Suppose that productivity growth increases such that trend output will grow faster, and currently true output will be below its potential since it will take some time

before the new opportunities are exploited. In response to new profit opportunities, investment will grow and will temporarily be above its long-run level (relative to GDP). First, higher incomes in the future will imply that consumers will spend some of the gain already today. In fact, the current account is attacked from two sides. With output lower than potential (and consumers spending some of the future gains, thus reducing the saving rate) and investment higher than its long-term level, the current account will weaken.

Looking at the beginning of the 2000s, the dominating effect has been the rise in government spending and a moderately bad recession (GDP-wise). Again, we have two factors that weaken the current account.

To conclude, this basic version of the intertemporal approach to the current account seems to give us at least a partial rationalization for the US current account deficit.

Still, many researchers are not satisfied with the performance of this theory when they test it more robustly against the data. The fundamental equation gives us one clear prediction: Absent large deviations from trend in the investment level, the current account should be pro-cyclical. Output above permanent (trend) output gives current account surpluses, while investment and government spending above the permanent levels give CA deficits. With both output and investment levels above trend, the net effect will depend on the absolute levels of the deviation from trend of the two components.

If we assume that the absolute level of the deviation from trend is larger for aggregate output than it is for investment, we have a problem in that this simple model is rejected empirically. Just take a look at the figure below, which clearly shows that the current account balance is strongly negatively correlated with the rate of GDP growth.
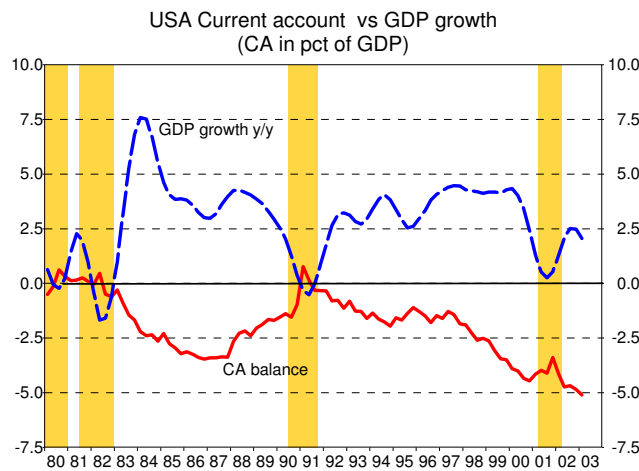

Figure 20: Current Account vs. GDP growth rate (Source: Ecowin)

(ii) Problems with the traditional approach
A major assumption of the traditional theory is that capital is perfectly mobile. As we emphasized above, this means that savings decisions and investment can be separated. Therefore, a reasonable test of the capital mobility assumption is to check the

correlation between saving and investment rates. In their famous 1980 article Feldstein and Horioka ran the regression

$$(I/Y)_{ct} = \alpha + \beta(S/Y)_{ct} + u_{ct}$$

in order to test the extent of international capital mobility. Here (I/Y) represents the investment rate and (S/Y) represents the saving rate. Theory suggests that the β parameter should be close to zero due to the separation of saving and investment decisions, but Feldstein and Horioka estimated β to 0,89. In other words, saving and investment rates in OECD countries were almost perfectly correlated. The β-estimate is a bit lower when using more recent data, but still far closer to 1 than zero.

Economists have used quite some energy trying to explain away this finding by arguing that the high estimate of β is due to common sources of variation in the saving and investment rates. They have had some success in doing so, but the consensus is that the correlations are still too high to be in accordance with the hypothesis of perfect capital mobility.

Other tests of capital mobility, such as the degree of international portfolio diversification and the validity of purchasing power parity, confirm that frictions in the international markets remain (though, we should note that the degree of mobility has been steadily increasing over the past decades).

A second test of the traditional neoclassical theory was proposed in Kraay et al. (2000). Holding productivity constant, the traditional theory predicts that countries should accumulate capital domestically until its capital-labor ratio is the same as abroad. Rich countries, with a surplus saving, will then invest abroad in countries with less capital per worker, since there the rate of return will be higher. In equilibrium, the rate of return, and thus also the capital-labor ratio, should be the same everywhere. This argument implies that the level of capital per worker should be independent of the wealth level of a country. However, the evidence shows that the wealth of a country and its capital-labor ratio is almost perfectly correlated (positively, of course), as shown in the figure below. We might suspect that this is due to the interplay between factor productivity and the level of the capital stock. A country that is poor initially (low level of capital per effective worker) will have low factor productivity and hence a lower optimal level of capital intensity, while the opposite is true for richer countries. However, even after controlling for differences in human capital, technology and institutions, Kraay et al. (2000) find that wealth remains the variable that better explains the variation in the level of capital per effective worker.
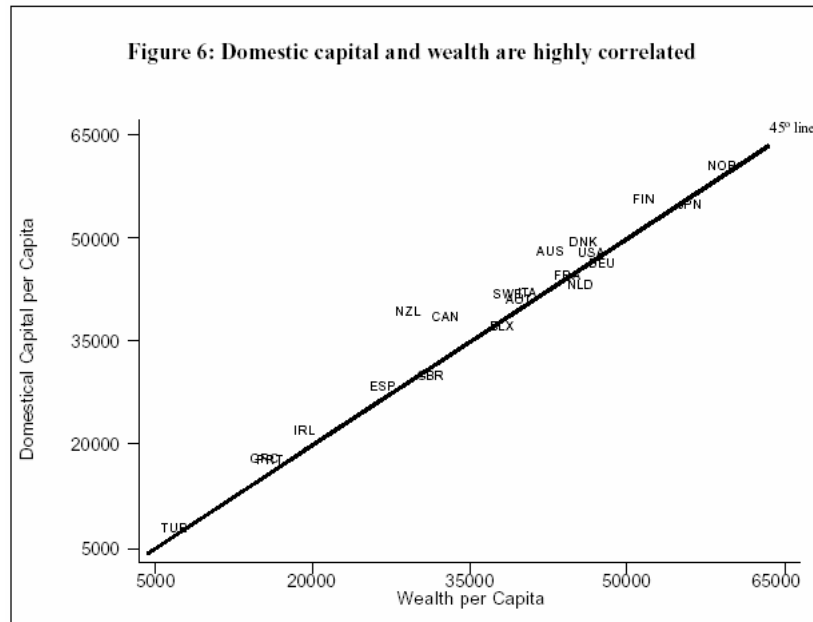
Figure 21 : The relation between wealth and capital intensity (Source: Ventura (2002))

(iii) An alternative: The portfolio approach (Ventura, 2002)
Ventura (2002) tries to alter the basic model above to make it consistent with the facts above. He first notes that the traditional model quite unrealistically makes the assumption that investors maximize expected returns and thus do not care about the risks involved. If we instead assume that investors demand a risk premium by investing abroad, the equilibrium condition is that the marginal productivity at home should equal the interest rate abroad plus some risk premium. What should determine this risk premium? First note that the total wealth of a country is $W = K + F$, or wealth (W) equals the domestic capital stock (K) plus the net foreign assets (F). The level of risk can be understood to be a measure of how vulnerable you are to fluctuations in the value/return of a single asset in your portfolio. Hence, the share of domestic capital in your total portfolio is a natural indicator of risk. This means that the risk premium will increase in (K/W). The new investment rule then tells us that MPK(K/L,A) = r + rp(K/W) (the marginal productivity, which depends on the capital intensity K/L and productivity A, should equal the world interest rate, r, plus the risk premium, rp(K/W)). This says that if the share of domestic capital stock is large, you will need a high marginal productivity at home to compensate for the higher risk.

For given wealth and population levels, the capital stock will be higher for higher productivity levels. But now also the wealth level affects the optimal level of domestic capital stock, since a higher wealth level makes the risk of holding a large domestic capital stock lower.

Also, a poor but high productivity country might now have the same capital stock as a rich low productivity country (see figure 22 below).
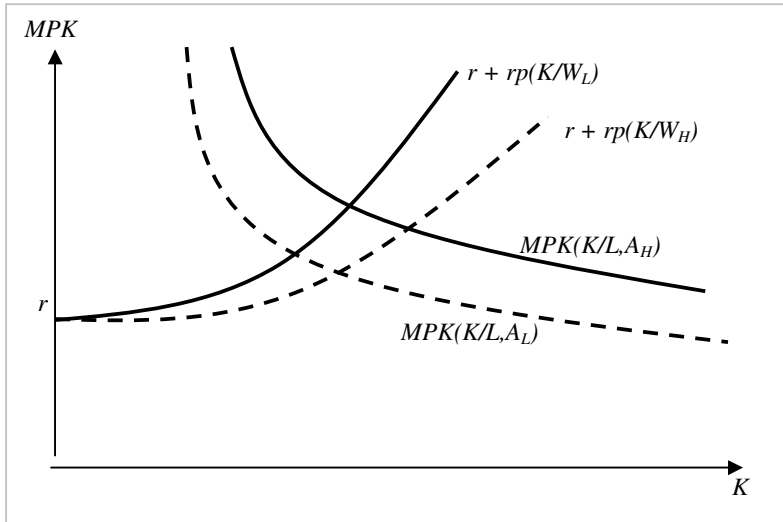
28

Figure 22: Relationship between capital stocks and the marginal productivity of capital in a model with investment risk

Assume now that investment risk is strong and diminishing return to capital weak (this is contrary to the traditional model), such that the rp-schedule is steep, and the MPK schedule relatively flat (see the figure below). Now, changes in wealth will lead to changes in the capital stock such that the share of capital in the portfolio is constant (K/W constant). Why is this? For a given technology level, A, $r+rp(K/W)$ must be constant. This means that for two wealth levels W_1 and W_2, we need $rp(K_1/W_1) = rp(K_2/W_2)$. But since the risk premium increases monotonically in K/W, this means that we need $K_1/W_1 = K_2/W_2$ for this to hold. The implication is that the capital stock moves in proportion to the wealth level, to keep the portfolio shares constant.
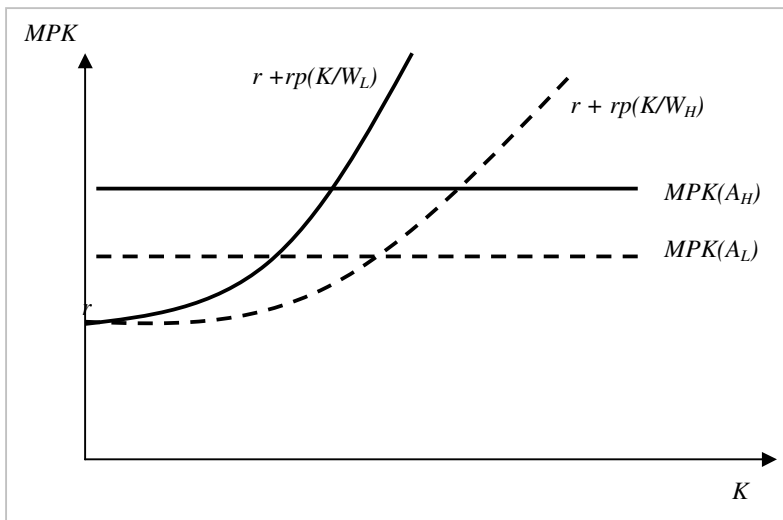

Figure 23: Capital stock versus the marginal productivity in a model with investment risk and constant returns to capital.

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What are the implications for movements in the current account? First note that, absent large revaluations in the market value of wealth, the changes in wealth can be approximated by net savings, so we have $S=\Delta W$. Further, net investment is $I=\Delta K$, and the current account is $CA=\Delta F$, the changes in the net foreign asset position. That the capital stock moves in proportion to the wealth level must imply that the foreign asset position does the same. Then the following must hold: $\Delta W/W =\Delta F/F$. Using the definitions above, we can rewrite this as $S/W = CA/F$, or

$$CA = (F/W)S = (1-(K/W))S = XS.$$

This equation says that the current account will equal the saving rate times the share of foreign assets in total wealth. This is due to the desire to keep the structure of the portfolio balanced.

The net foreign asset position, F, of many countries is negative. This means that the share of capital is larger than one. Then, shocks that cause an increase in saving, and which traditionally are expected to give a one-for-one increase in investment abroad, might now cause the current account deficit to increase.

Another implication of the theory is that for a given wealth level, the portfolio composition will now be determined by cross-country variation in productivity. Countries with high productivity will be biased towards a higher domestic capital stock and lower net foreign asset position. This is because high productivity makes it optimal to take on more risk in the portfolio.

Ventura has tested whether this new theory might explain how changes in savings affect the current account. The regression he ran was:

$$CA_{ct}=\alpha+\beta X_{ct}S_{ct}+u_{ct},$$

where the estimate of β is expected to be close to one. Here X_{ct} is the share of foreign assets in the portfolio. In other words, he tests whether changes in savings lead to changes in the current account in the same proportion as the country holds foreign assets. This is in fact also the result he gets. The estimate of β is very close to one, and this simple model can explain as much as thirty percent of the observed (long-term) variation in the current accounts across countries. However, the new rule does not explain much of the variation in current accounts within countries. This indicates that there is a discrepancy in the short and long term behavior of the current account.

What, then, does this tell us? Basically just that saving and investment are highly correlated in the long run. Since the net foreign asset positions are small ($X\approx0$), portfolio growth (increases in W) implies that the great bulk of new saving goes into domestic investment. It can also explain why there is a near zero correlation between investment levels and the current account in the long run, as creditor countries build up foreign assets as wealth increases, and debtor countries build up their foreign debt. What we should see is that investment and the current account should be positively correlated in creditor countries, and negatively correlated in debtor countries. Long run data shows that this is also the case, even if the relationship is quite weak.

In order to better explain why countries rebalance their portfolios in the short run, but keep them constant in the long run, we need another element in this theory. The traditional model assumes that the countries can change their capital stock with negligible costs of adjustment. (Optimal) fluctuations in investment will then have no effect on the return on capital. But an increase in saving today that would lead to increases in investment according to the share (K/W) in the long run will not be invested immediately due to the costs of shifting resources from production activities to investment activities. Hence we would expect that in the short run an increase in saving would lead to a lower increase in investment. However, when saving returns to normal levels investment levels are still above steady state levels as the capital stocks still needs to find its new level. Hence, in the first period the current account surplus will be bigger than expected in the long run, while it will be less than expected in the second period.

Ventura finds strong support for this theory in the data, and has then shown how one may account for the short and long run fluctuations in the current account. The overall message is then that, allowing for a couple of modifications to the traditional neoclassical model, the intertemporal approach to the current account provides a fairly good description of the industrial country data.

Using the Portfolio-View to Analyze US Current Account Deficit

Let us now follow Ventura (2001) and apply his view of the current account to the US current account deficit. We have the relation $W_t = K_t + F_t$, where F_t is the net international investment position, and $X_t = F_t/W_t$ is the share of net foreign assets of total wealth. With a constant balance in the portfolio, we expect that F_t changes over time according to the relation

$$\Delta F_t = X_t \Delta W_t,$$

which is just the same relation as we saw above. Thus we can test whether the development in the net foreign asset position is simply a manifestation of changes in US wealth. Absent any changes in the distribution of returns, we have seen that the current account moves according to the equation $CA = (F/W)S$. However, the portfolio composition is only constant given a constant distribution of returns (at home and abroad). Changes in this distribution will cause changes in the portfolio balance. For instance, higher productivity at home, will, even with constant return to capital and an increasing risk premium in K, cause the share of wealth invested in domestic capital to increase (see figure 21). So the equation above gives us the current account balance absent any changes in the distribution of returns. A change in this distribution biased towards an increase in (K/W) will worsen the current account deficit (for a net debtor country).

According to this view of the current account, we can split the current account deficit in two parts: i) portfolio growth (ΔF due to ΔW), and, ii) portfolio rebalancing ($\Delta(K/W)$ due to Δr). We can confront this theory with the data.

 Ventura uses the relation $CA_t = X_t S_t$, which approximates the content of the theory as long as asset price revaluations are not too large, to check whether the predicted and actual current account balance move together. With the shift from a positive to a negative foreign investment position for the US, the share of net foreign assets in the portfolio, X, turned negative during the late 1980s. From figure 24 below (figure 1 in Ventura, 2001) we can see that the actual fluctuations are far greater than those predicted, especially during the 1980s and the late 1990s and (not in the figure) early 2000s. This is easy to understand in light of the theory. The theory predicts that the

current account should be close to zero when X is close to zero. We know that the capital-output ratio, K/Y, is about 3 in the US. Further, F/Y $\cong$ - 0.3 today, and it was even closer to zero during the 1990s. This means that total wealth is about 2.7 times GDP, and the ratio of foreign assets to total wealth is X = –0.3/2.7 = - 1/9. Multiplying – 1/9 by the US net saving rate, let's say 3%, Ventura's theory predicts, all else equal, that the US current account should be – 1/9*3% = -1/3% of GDP. Thus, there is a clear bias towards small current account balances when X is small.

The 1980s period can be explained by the tight monetary policy and high real interest rates leading to a rebalancing of the portfolio, and further the emerging market debt crisis that drew assets away from these markets.

The deviation in the recent period, however, is mainly caused by large revaluations of US assets, which caused US savings to capture just 20 percent of the increase in market wealth from 1992 to 1999. This means that $CA_t=X_tS_t$ underpredicts the current account deficit, as the true measure should be $CA_t=X_t\Delta W_t$ and ΔW is larger than S during these years.

However, over the past couple of years, with a period of large devaluations of US assets but with the US current account still at record levels, the theory does not seem to capture the movements in the current account deficit. During the first years after year 2000, US savings were larger than the change in US wealth due to the declines in the stock market. This means that the theory, taking wealth devaluations into account, predicts that the current account deficit should be close to zero. This has not been the case.

Figure 1. Actual and Predicted U.S. Current Account Balance, 1970–99

Percent of GNP
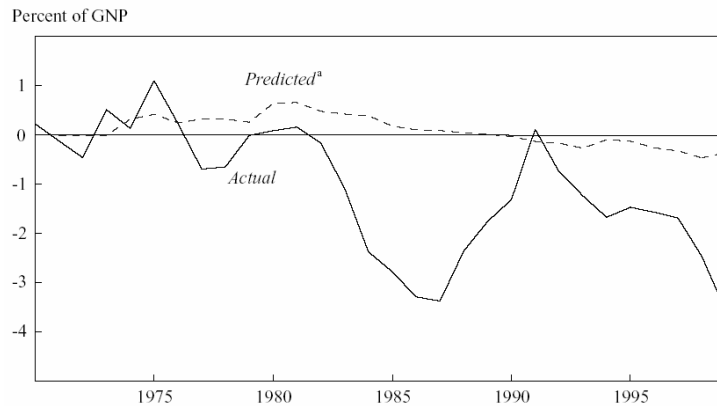
Source: Author's calculations based on data from Bureau of Economic Analysis, National Income and Product Accounts.
a. Using equation 2.

Figure 24: Actual vs. Predicted US Current Account using the Portfolio Approach under the assumption of small wealth revaluations (Source: Ventura, 2001)

This analysis is partial, however. Wealth revaluations have happened all over the world, and they have been as large, or larger, elsewhere as they have been in the US.

Basically, a great belief in your own superiority creates current account deficits. As Americans keep saying that they are blessed by God and live in the best country on the planet, this could be an important explanation of the current account deficit and the negative F (net foreign debtor). Further, the talk of structural problems elsewhere might contribute to a positive F there (net foreign creditors).

If we want to correct for the mismatch between saving and changes in wealth, we may look directly at the equation $\Delta F_t = X_t \Delta W_t$. The results from this analysis are shown in figure 25 below, taken from Ventura (2001). The rebalancing during the 1980s is still visible, but the 1990s episode has more or less disappeared. This means that revaluations of wealth explain much of the changes in net foreign assets during this period. Since the average portfolio is short in foreign assets, the growth in wealth during the 1990s meant that the net foreign asset positions worsened (Americans invested in domestic assets beyond the increase in wealth).

Figure 2. Actual and Predicted Change in U.S. Net Foreign Assets, 1970–99

Percent of GNP
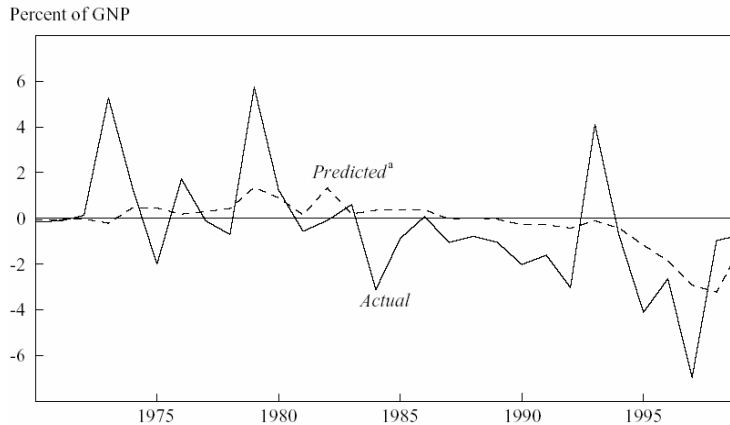
Source: Author's calculations based on data from Bureau of Economic Analysis, *Survey of Current Business*, April 2000.
a. Using equation 1.

Figure 25: From Ventura (2001)

All in all, Ventura's approach looks promising, even though his theory has a hard time explaining the most recent developments, with record deficit while the change in wealth levels have been negative. Further, the approach also shows how expectations and sentiments are important in order to predict current account developments. First of all, X (the share of net foreign assets in the portfolio) depends on the expected distribution of returns. As long as investors have great confidence in a US economic miracle, this will contribute to a more negative X, and the current account deficit will increase. However, if the investors come to understand that there is something wrong with America and the expected distribution of returns no longer favor large holdings of US assets, the tide will turn. Thus, Ventura has provided us with a formal tool that better helps us to understand how the US deficit is dependent on the willingness of foreigners to hold US assets, and the strong belief Americans have in their own economic superiority.

6) Current Account Sustainability

We have now looked at the details of the US saving rates and current account deficits. As we move towards the final parts of this paper, we also have to start pondering the hard question of where things are heading next. In the final section we will look at some feasible future scenarios. In this section we will aim a bit lower, and look at whether there is something general we can say about the sustainability of long run current account deficits.

(i) Some simple accounting dynamics

First, we will look at some simple exogenous dynamics. For instance, given that the current account deficit equals - 5% of GDP, with the latter growing at 5% per year, where will we end up in the long run?

Following Obstfeld and Rogoff (2000), let B denote the US net international investment position. Let Y=Py be the nominal GDP, where P is the price level and y the level of real GDP. Let at dot over a variable indicate its time derivative, i.e. $\dot{X} = dX/dt$. Then, the rate of inflation is $\pi = \dot{P}/P$ and the growth rate of GDP is $g = \dot{y}/y$. Thus, the growth rate of nominal GDP is π +g.

Since the change in the net international investment position, absent revaluation of assets, is equal to the current account balance, we can write $\dot{B} = CA$. This is the change in the nominal foreign assets. We are interested in the level of net foreign assets as a share of GDP. Let this be denoted by b=B/Y. Then, the change in the level of net foreign assets as a share of GDP is given by

$$\dot{b} = \frac{\dot{B}}{Y} - \left(\frac{\dot{Y}}{Y}\right)b = \frac{CA}{Y} - (g + \pi)b \,.$$

In the long run, the level of net foreign assets to GDP must be stable. That is, in steady state we need $\dot{b} = 0$. Using this in the equation above we find the stady state level of net foreign assets to GDP. This is given by

$$b^{ss} = \frac{CA/Y}{g + \pi} \,.$$

This implies that in our example, with nominal GDP growth at 5% (for instance by having g = 0.03, π = 0.02) and a current account deficit at –5% of GDP forever, we get b^{ss} = - 1. In other words, such an economy will end up having a negative net foreign asset position equal to 100% of GDP in the long run.

To get a better understanding of the implications of this, we should take a look at the relationship between the current account and the trade balance. We know that the current account equals the balance of trade plus net factor payments from abroad. Let the net factor payments be NFP = rB, i.e. they equal the return on the net foreign asset position, with r being the global return to capital. In symbols we get CA = TB + rB. Dividing by GDP, and letting lower case letters denote shares of GDP, we have the relation

$$ca = tb + rb.$$

Suppose that r equals 5%. Then we see that steady state net factor payments will equal (-1)0.05, which is equal to the current account deficit as a share of GDP. But then, this means that trade must be balanced in the long run, i.e. $tb^{ss} = 0$. This example shows that there is an important distinction between the current account and the trade balance (net exports) when the absolute net foreign assets position is large.

What do we learn from this? When, specifically, the US is running large deficits over long periods of time, the net foreign asset position will weaken gradually. This will imply that net factor payments will be negative and grow over time. If, then, the US is to be on a path that is stable in the long run, we need the trade balance to strengthen over time. And if foreigners earn a return on their investments in the US equal to the rate of US GDP growth, the net exports of the US must be zero in the long run.

In theory, then, there is no problem for a country to run large current account deficits over long periods of time. As long as foreign investors think that the path is viable, they should be willing to hold the assets. In reality, however, countries do not often run large deficits over long periods of time. Usually there are some forces, such a currency depreciations and capital outflows, that cause the tides to turn.

Figure 26 below is taken from Obstfeld and Rogoff (2004), and shows the hypothetical path of the negative US net foreign asset position relative to GDP given 5% current account deficits and a GDP growth of 3.5%. For a comparison, they also plot foreign debt levels reached by other countries.
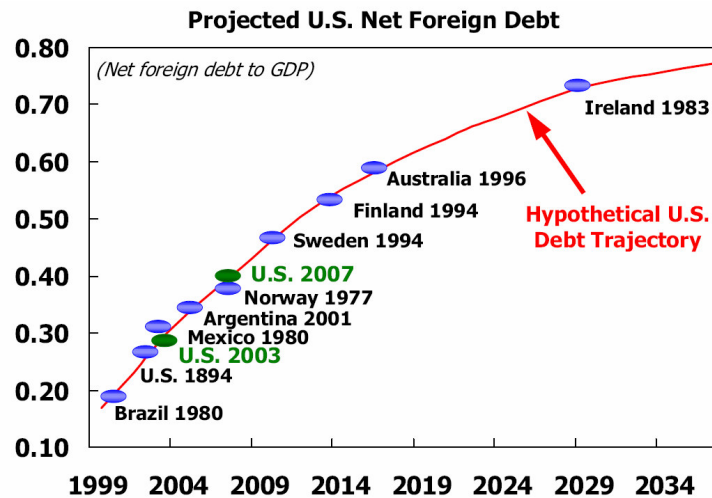
Figure 26 : A projection of US net foreign debt and a comparison to levels recorded by other countries
(Source: Obstfeld and Rogoff, 2004)

For most of the other countries in the graph, the debt levels they experienced either occurred prior to a crisis or during a crisis. For instance, Sweden and Finland were experiencing crises in the early 1990s, while also Brazil, Mexico, and Argentina experienced their share of trouble. Norway, however, is an example of how to exploit the opportunities stemming from an international capital market. Backed by millions

and millions of barrels of oil under the North Sea, no trouble arose when Norway borrowed money on the international market to invest in infrastructure.

So what about the US? There is no reason to believe that the US will ever be treated as a banana republic by investors. But are there any factors that make the US special with respect to accumulation of foreign debt? We will turn to this now.

(ii) The sensitivity of US foreign debt to exchange rate movements
For most countries, accumulation of foreign debt means borrowing in a foreign currency. This means that there is no easy way out when it comes to repayment of the debt (besides defaulting). Whereas for instance domestic government debt can be inflated away, no such opportunities exist with international borrowing. Suppose for instance that the government (unexpectedly) taxes domestic bond holders by raising the rate of inflation. Then the real burden of the domestic government debt declines. However, it is not possible to affect the real burden of international debt in this manner. Rapid inflation will cause the currency to depreciate (such that the real exchange rate is constant), and the real value is unchanged. Further, if there are successful currency attacks like during the Asian crisis, the real value of foreign debt denominated in a foreign currency will increase, and give a blow to the balance sheets of all firms with international borrowing.

The US is different in this respect, a fact that has been given increased attention over the past years (see for instance Tille (2003, 2004) and Gourinchas and Rey (2004)). The US liabilities are almost completely denominated in US dollars, while about 60% of the US assets also are denominated in US dollars (see Tille,2003). This has significant implications for how the exchange rate can affect the level of US net foreign debt. We will illustrate this by an example.

Suppose the US net foreign debt is 30% of GDP, with the liabilities equal to 100% of GDP and assets equal to 70% of GDP. Now suppose that the USD depreciates by 10%, all else equal. The liabilities don't change. But the value of foreign assets denominated in foreign currencies increase in value by 10%. Since 40% of the assets are denominated in foreign currencies, this means that the value of the assets increases by 0.1*0.4*0.7=2.8%. Thus the US net foreign debt declines from 30 to about 27% of GDP.

Now suppose that the level of financial integration is higher. The US net foreign debt is still 30% of GDP, but now the liabilities equal 230% of GDP and the assets equal 200% of GDP. Again, suppose that the USD depreciates by 10%, all else equal. Now the value of the assets increases by 0.1*0.4*2.0=8.0%. Thus the US net foreign debt declines from 30 to about 22% of GDP.

The implications of these accounting effects is that the value of US foreign debt to some extent can be reduced by currency depreciations, especially if the level of financial integration is high. However, one should keep in mind that if a currency depreciation is expected, foreign investors will demand a compensation in the form of higher returns in order to accumulate more assets in the first place. Thus, even though the exchange rate drives much of the year to year development in the level of US net foreign debt, this should not be taken as a sign that the US easily can get out of trouble through a depreciation of the currency.

7) Now what? Potential Future Scenarios

We have now looked at many of the facts surrounding the US current account deficit and the low saving rate. Of course, one would like to use these to make up ones mind about the future develoment of the US dollar and the prices of other financial assets, in the US and other places.

The starting point is that the current pace of US foreign debt accumulation seems to be unsustainable in the long run. We saw above that long-run sustainability requires that the trade deficit decreases as the amount of factor payments to foreigners increases. For this to happen, we need US exports to grow considerably faster than US imports, since exports must grow from a lower base. At the moment, however, this is not what we see. Exports are not growing faster than imports, and since imports grow from a larger base, the trade deficit has continued to expand.

Also, in light of Ventura's theory discussed above, a justification of the large current account deficits boils down to an argument saying that US returns have been high, and will be high, relative to other countries. However, the data does not support this. In fact, the return on equity is just as high in Europe, and given that European stocks are sold at a 50% discount relative to US stocks, it is not easy to see why the sentiment favoring the US would last indefinitely.

The current account deficits have caused the US net foreign debt to increase from 5% in 1997 to 24% of GDP at the end of 2003. Foreigners and to a large extent Asian central banks have so far willingly financed the excess of US consumption over income. However, at the current pace, the amount of US assets in the portfolios of foreign countries is rising so fast that soon one would expect them to require a risk premium if they are to hold an even greater proportion of their assets in the US.

These facts make us draw two conclusions: First, avoiding a crisis in the future (in other words, to be at a sustainable path) requires the US trade deficit to decrease over time, as a proportion of GDP. Second, absent a large increase in the growth of other economies, for the US trade deficit to reduce, we need a further depreciation of the US dollar.[4] Then, low US interest rates will be incompatible with foreign investors being willing to further accumulate US assets. For instance, according to the interest parity arbitrage condition, the US interest rate should equal the foreign interest rate plus the expected depreciation of the USD. With an expectation of a siginificant USD depreciation, Americans should not be able to finance their excess absorption by offering foreigners low interest rates. This argument is especially important for the US, since the US foreign debt is almost exclusively denominated in USD. This makes the value of foreigners' loans to the US extremely sensitive to USD movements. It seems unlikely that Asian central banks in the long run will tolerate the losses they have experienced hitherto, even for the sake of strengthening their domestic export-oriented sectors. This is especially true if other investors flee the US, and the burden on Asian central banks becomes even greater.

The author does not agree with the argument made by Tille (2003) and others, that the portfolio composition of US net foreign debt makes the current account deficity more likely to be sustainable. Their argument is that, as we saw above, USD movements

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[4] A depreciation of the USD will only cause the US trade deficit to fall if the Marshall-Lerner condition is satisfied. This condition requires that the sum of the elasticity of exports and elasticity of imports w.r.t. the exchange rate is large enough s.t. the growth in the volume of net exports is large enough to compensate for more expensive imports and less expensive exports.

cause significant adjustments in the US net foreign debt. However, foreign investors are aware of this, and should require a compensation in the form of higher returns in order to hold more US assets in the first place. The exchange risk in the foreigners portfolio makes investors more aware of the total US net international investment position, and this will likely work as a disciplining device. Since the risk of their portfolio will increase in the amount of net US foreign debt, their fear of a depreciation in the USD will lead to higher required returns. Thus, interest rates will increase, and this will cause US private saving to rise and investment to fall. As long as the increase in private saving minus investment is larger than the increase in the government deficit that follows from higher interest rates on the debt that is issued, the US trade deficit will decline.

Given that a fall in the US trade deficit is needed, and that this can hardly come about without a depreciation of the US dollar, what will this adjusment look like?

First, we will take a look at the level of economic activity. From basic accounting we can see that a reduction of the US trade deficit requires that aggregate income grows relative to aggregate absorption. In particular, consumption growth will have to slow down relative to income growth. For aggregate US GDP growth not to decline, the adjustment of the trade deficit has to take the form of a boost in exports. Otherwise, consumption must fall in order to bring down imports, and then domestic activity will also suffer. This means that the forces in the global economy have to reverse. The rest of the world (especially Asia) cannot rely on demand from the US creating economic opportunities. Instead, growth here must come from serving domestic (and Chinese) demand. On the other hand, the US has to rely on robust growth in demand elsewhere to see its exports grow.

If the trade deficit adjustment happens mainly through increased private saving and reduced consumption and not through growth in external demand, we are likely to see a fall in US stock prices, as profits fall. Further, the necessary fall in the USD will be larger. It seems unlikely that the adjustment can take place without a substantial drop in the growth of US imports, and thus also in the growth of aggregate consumption.

Finally, we will try to get an understanding of the type and magnitude of the inevitable depreciation of the US real exchange rate.

Figure 27 shows the development of the trade weighted USD over the past 10 years. The figure shows that the broad USD has depreciated by about 17% since its peak in early 2002. We also see that the trade weighted USD is by no means weak when we look over longer horizons. This observation indicates that the USD has to fall considerably more if the readjustment of the trade balance is to happen.

USD Trade Weighted Index
(Jan 1995 - Nov 2004)

Figure 27
(Source: Federal Reserve)

So by how much does the USD have to fall in order to induce the proper amount of adjustment? This question has been analyzed by Obstfeld and Rogoff (2000, 2004). Their starting point is that a move towards a reduced US trade deficit will be caused either by increased US savings or increased foreign demand. Exchange rate movements alone cannot fix the deficit. Instead, what happens is that savings first adjust, and a by-product will be changes in the value of the US dollar.

With higher savings in the US, imports stagnate through reduced growth in consumption. This means that the demand for US non-traded goods will also decline, since the growth in consumer spending will decline for all goods in the bundle consumers are purchasing. If consumption increases in the rest of the world, this means that consumer spending on non-traded goods will increase. Obstfeld and Rogoff then ask what the required changes in relative prices are in order for all markets to clear. The analysis is done assuming that the level of economic activity is fixed.

Their basic argument is the following: Suppose that US demand declines. Then the demand for both US traded and non-traded goods decline. Given a certain production of non-traded goods, we need the relative price in the US of non-traded goods to fall. But we also need the prices of US traded goods to fall, since US demand has declined and markets must clear. But for Americans we already saw that the prices of traded goods had to increase relative to nontraded goods. The solution is that US traded goods have to become cheaper for foreigners, i.e. there has to be a depreciation of the real exchange rate. Relative to the case where the non-traded goods are excluded from the analysis, the required exchange rate adjustment now has to be larger, since relative prices of traded goods increase in the US, and one must rely even more on foreign demand to make them demand the remaining supply. The mechanism that makes this happen is an even steeper decline in the price foreigners have to pay for US products.

Obstfeld and Rogoff then perform a series of experiments. They conclude that in the long term, the real US dollar must depreciate by at least a further 20%. Given that inflation rates in the US and in its major trading partners are roughly similar, this gives a similar required drop in the value of the nominal US dollar.

So, given that we accept that a depreciation of the trade-weighted US dollar has to be about 20% for the US current account deficit to be sustainable in the long run, how can this come about?

Figure 29 below shows the development of the USD against the currencies of its major trading partners over the past four years. Also, in Figure 28 you can see the relative weights of the most important countries in the trade-weighted USD index. The figure clearly shows that the Euro, Canadian dollar, and the British pound have strengthened considerably from 2002 and onwards, while the Japanese Yen also has appreciated, but to a lesser extent. Given the troubles of some of the Euro area economies, and that Great Britain also is experiencing record high trade deficits, we need future adjustment of the USD to take place via other channels.

Suppose that Americans were to start saving more. This implies that interest rates will fall in the US, and domestic saving will crowd out foreign financing. Investors will move money out of the US, and those currencies that are floating will appreciate furhter. However, for the required USD depreciation to occur, the pressure on a few currencies will be extraordinary, and must stop at some point when the respective economies are beginning to suffer too much trouble.

Trade weights USD 2004

Region	Weight (%)
EUR	18.5
CAN	16.5
JPN	11.1
MEX	11
CHN	9.8
GBR	5.2

Figure 28 (Source: Federal Reserve)

USD vs. Various Currencies
(Jan 2000 - Nov 2004, Index: Jan 2000 = 1)
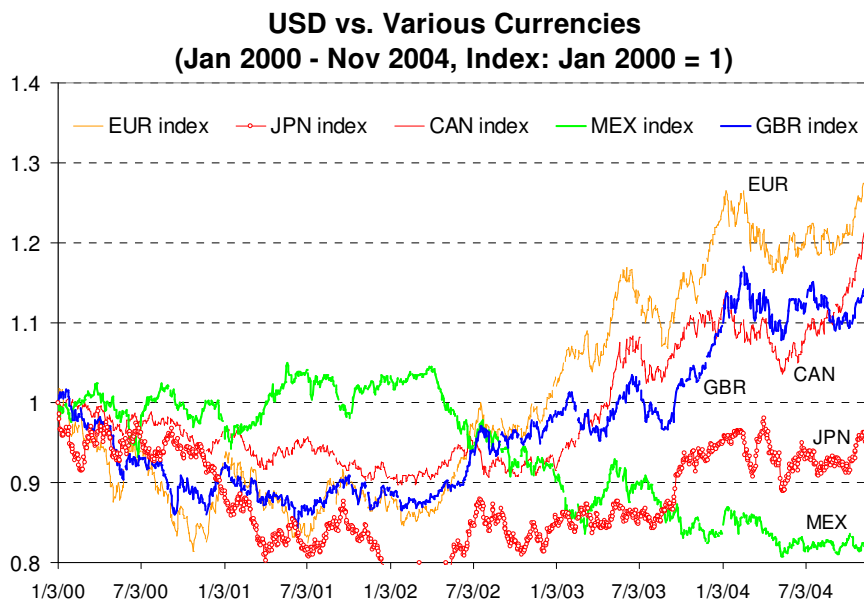
Figure 29: The USD versus other currencies. Note that the inflation rate in Mexico is higher than in the US, so the Mexican peso should depreciate over time, all else equal. (Source: Federal Reserve)

It therefore seems to be the case that increased exchange rate flexibility is necessary for the switch to a less imbalanced global economy to take place. Some researchers have argued that the current system where Asian countries manage their currencies either through currency pegs of heavy interventions by the central bank resembles the Bretton Woods era (see Dooley, Folkerts-Landau and Dooley (2003,2004,a,b)), and that this might turn out to be a stable system. However, as argued by Roubini and Setser (2004), this system, if continued, will be destabilizing rather than stabilizing. The reasons are that it sustains temporarily large US imbalances that are inconsistent with long-run sustainability, that the costs of this system are large for the Asian countries, and that the costs for European countries will be too great (due to the pressure on EUR). There is also a collective action problem for the Asian countries: Given an expectation of a USD depreciation, it is rational for each central bank to diversify their portfolio by selling USD reserves and buying EUR. Given that other countries continue accumulating only USD, this will not add too much to the pressure on EUR. But if all countries start doing this, the system will collapse. Thus, it seems likely that a realignment of Asian currencies in particular will be important for a successful transition. A revaluation of the Chinese Renminbi is an important first step. Given the attractiveness of the Chinese economy, its large inflows of foreign direct investment, and its level of economic development, there is no reason why China should be running current account surpluses. Also, an ever weakening Renminbi due to the peg to USD, is not what one would expect to see were the currency to float. Further, due to the pressure on other economies due to the competitive situation of many of Chinas industries, these economies feel forced to engage in currency 'manipulations' in order to avoid to large dislocations in their economies. Were China to revalue the Renminbi, it would be a lot easier for its neighboring countries to let their currencies appreciate as well, and this would be a significant step towards proper relative price levels between countries.

In the mid 1980s, the US dollar depreciated significantly and relatively rapidly. The effects on the global economy were quite mild. Given that the global markets are more complete and efficient now than they were twenty years ago (see e.g. Greenspan, 2004), why would things be different this time? Obstfeld and Rogoff (2004) argue that there are a number of differences pointing to more difficulties this time. In fact, as they point out, the similarities with the early 1970s are quite striking. Back then as now the US ran large budget deficits. The US was fighting the war in Vietnam, whereas it is currently Iraq that it is invaded by US forces. Oil prices were high also then (but relatively higher 30 years ago), and notably, in 1973 we saw the breakdown of the Bretton Woods fixed exchange rate system. Could there be a similar breakdown of the semi-fixed exchange rate system between the US and East Asia in the not to distant future?

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