Goldman Sachs

Global Economics Paper No: 136

GS GLOBAL ECONOMIC WEBSITE
Economic Research from the GS Institutional Portal
at **https://portal.gs.com**

Dark Matter or Cold Fusion?

- Ricardo Hausmann and Frederico Sturzenegger recently argued that there has been no true (cumulative) US current account deficit since 1980. The implied policy message is that there is no US external imbalance and that the remaining global imbalances look much more manageable. This paper shows that the arguments and data used by H&S do not stand up to close scrutiny.
- External seigniorage dark matter from U.S. currency is real but accounts for at most one-sixth of the H&S number, and could be much smaller.
- Insurance premium dark matter cannot rationalise a permanent ex-post excess return on US investment in emerging market debt financed by the issuance of US Treasury bonds.
- The argument that knowledge dark matter is embodied in US direct investment abroad to a greater degree than in foreign direct investment in the US is not supported by any reliable data.
- Of the US$3.1tn of dark matter claimed by H&S, at most US$500bn can be verified. With most of the dark matter missing, the H&S approach is tantamount to discounting risky income streams using risk-free discount rates.
- With the US trade gap in October 2005 widening to a new record US$68.9bn, the US trade deficit is unsustainable. Its correction will require a large depreciation of the real effective US Dollar exchange rate, on reasonable estimates by no less than 30%, and quite possibly by more. The timing of this is, however, uncertain.

Thanks to Jim O'Neill for encouraging me to grapple with the dark matter issue. Also to William Dudley and Jim O'Neill for helpful comments on earlier drafts.

Willem Buiter
Advisor
Global Economic Research

January 16, 2006

Goldman Sachs Economic Research Group

[1] Jim O'Neill, M.D. & Head of Global Economic Research
[2] William Dudley, Advisory Director & Deputy Head of Global Economic Research

Global Macro & Markets Research

[2] Dominic Wilson, M.D. & Director of Global Macro & Markets Research
[1] Francesco Garzarelli, M.D. & Director of Global Macro & Markets Research
[1] Michael Buchanan, E.D. & Director of Global Macro & Markets Research
[2] Sandra Lawson, V.P. & Senior Global Economist
[1] Dambisa Moyo, E.D. & Economist, Pension Fund Research
[1] Binit Patel, E.D. & Senior Global Economist
[1] Kevin Edgeley, E.D. & Technical Analyst
[2] Mónica Fuentes, V.P. & Global Markets Economist
[2] Jens J Nordvig-Rasmussen, V.P. & Global Markets Economist
[2] Roopa Purushothaman, V.P. & Global Markets Economist
[1] Thomas Stolper, E.D. & Global Markets Economist
[1] Fiona Lake, Associate Global Markets Economist
[1] Michael Vaknin, Associate Global Markets Economist
[2] Themistoklis Fiotakis, Research Assistant, Global Markets
[2] David Heacock, Research Assistant, Global Macro
[1] Anna Stupnytska, Research Assistant, Global Macro
[1] Sergiy Verstyuk, Research Assistant, Global Markets

Americas

[9] Paulo Leme, M.D. & Director of Emerging Markets Economic Research
[2] Jan Hatzius, M.D. & Chief US Economist
[2] Edward McKelvey, V.P. & Senior US Economist
[2] Alberto Ramos, V.P. & Senior Latin America Economist
[8] Alec Phillips, V.P. & Economist, Washington Research
[2] Andrew Tilton, V.P. & US Economist
[8] Chuck Berwick, Associate, Washington Research
[2] Malachy Meechan, Associate, Latin America/Global Markets
[2] Pablo Morra, Associate Latin America Economist
[2] Sara Aronchick, Research Assistant, US
[2] Avinash Kaza, Research Assistant, US

Europe

[1] Erik F. Nielsen, M.D. & Chief European Economist
[1] Ben Broadbent, E.D. & Senior European Economist
[4] Rory MacFarquhar, E.D. & Senior Economist
[10] Dirk Schumacher, E.D. & Senior European Economist
[3] Nicolas Sobczak, E.D. & Senior European Economist
[1] Ahmet Akarli, E.D. & Economist
[1] Kevin Daly, E.D. & European Economist
[1] Javier Pérez de Azpillaga, E.D. & European Economist
[1] Istvan Zsoldos, E.D. & European Economist
[1] Inês Calado Lopes, Associate European Economist
[1] Neena Sapra, Research Assistant, Europe
[1] AnnMarie Terry, Research Assistant, Europe

Asia

[5] Sun Bae Kim, M.D. & Co-Director of Asia Economic Research
[7] Tetsufumi Yamakawa, M.D. & Co-Director of Asia Economic Research
[6] Adam Le Mesurier, V.P. & Senior Asia Pacific Economist
[7] Naoki Murakami, V.P. & Senior Japan Economist
[5] Hong Liang, V.P. & Asian Pacific Economist
[7] Yuriko Tanaka, V.P. & Associate Japan Economist
[5] Enoch Fung, Associate Asia Pacific Economist
[5] Helen Qiao, Associate Asia Pacific Economist
[7] Rie Kitagawa, Research Assistant, Japan
[5] Yu Song, Research Assistant, Asia Pacific
[5] Mark Tan, Research Assistant, Asia Pacific
[7] Daisuke Yamazaki, Research Assistant, Japan
[5] Eva Yi, Research Assistant, Asia Pacific

Admin

[1] Linda Britten, E.D. & Global Economics Mgr, Support & Systems
[2] Melisse Dornier, V.P. & US Economics Mgr, Admin & Support
[1] Philippa Knight, E.D. & European Economics, Mgr Admin & Support

Location

[1] in London +44 (0)20 7774 1160
[2] in NY +1 212 902 1000
[3] in Paris +33 (0)1 4212 1343
[4] in Moscow +7 095 785 1818
[5] in Hong Kong +852 2978 1941
[6] in Singapore +65 6889 2478
[7] in Tokyo +81 (0)3 6437 9960
[8] in Washington +1 202 637 3700
[9] in Miami +1 305 755 1000
[10] Frankfurt +49 (0)69 7532 1210

Dark Matter or Cold Fusion?

1. A Contrarian View

Like many economists, I have laboured under the impression that the US has been a net external debtor for at least the last 15 years. Except for a tiny surplus in 1991, the US current account has been in deficit every year since 1982, and for the past five years the size of the deficit has grown in US Dollar terms, in real terms and as a share of GDP. Data on the net external investment position of the US, whether measured at historical cost, current cost or market value (Table 1) show the net external indebtedness of the US increasing from 1980 until 2001. The historical cost measure of net US external indebtedness continued to increase in 2002, 2003 and 2004, and will do so again in 2005. The weakening of the US Dollar from 2002 till 2004 stabilised the market value of the net US external debt position, and slightly lowered net US external debt as a share of GDP, despite the continuing large US current account deficits. During these years both the public and the private sectors of the US were beneficiaries of the 'exorbitant privilege' (Gourinchas and Rey (2005)) of being able to borrow from the rest of the world using mainly US Dollar-denominated debt instruments.

During most of the 25-year period summarized in Table 1, changes in asset valuations (reflecting changes in US Dollar prices and foreign currency prices of US external assets and liabilities as well as changes in US Dollar exchange rates) have, on balance, mitigated the effect of the cumulative current account deficits, but have not fully compensated for them, let alone reversed them. Gourinchas and Rey (2005) provide a detailed decomposition of the change in market value into a 'flow of funds' component, measured by cumulative current account balances, and a valuation component. The strengthening of the US Dollar during 2005 will reinforce the impact on the US net external debt to GDP ratio of the growing US current account deficit, which is likely to exceed 6% of GDP in 2005. Other capital gains and losses on the portfolio of external assets and liabilities may dampen the increase in the net debt to GDP ratio, but are unlikely to be large enough to neutralise it.

I also held the view that the net debtor position of the US is not consistent with the indefinite continuation of the current account deficits and external primary deficits (current account deficits net of foreign income payments and receipts - roughly the trade balance plus net current transfers) of these past few years. Both the current account deficit and the primary external deficit for 2005 are likely to be in excess of 6% of GDP. I shared the view of Jim O'Neill and Jan Hatzius (2002, 2004), Mann (2002), Roubini and Setser (2004), Obstfeld and Rogoff (2005), Blanchard, Giavazzi and Sa (2005), Chinn (2005), Cline (2005), Feldstein (2006) and many others, that a reduction of the current account deficit to a sustainable level would require a significant depreciation of the real effective (trade-weighted) exchange rate of the US Dollar. With central banks at home and abroad committed to low inflation, such a real dollar depreciation would inevitably have to occur mainly through a depreciation of the nominal effective exchange rate of the Dollar. The longer the necessary policy measures (fiscal tightening in the US and a boost to domestic demand in much of Asia and the EU) are postponed, the more likely a disorderly adjustment of key asset prices, including a sharp depreciation of the Dollar (for an alternative view that does not rely on dark matter, see Dooley, Folkerts-Landau and Garber (2004)).

In a recent contribution, Ricardo Hausmann and Frederico Sturzenegger (2005) (henceforth H&S) argue that, properly measured, there has not been a (cumulative) US current account deficit since 1980. The policy message is: 'Don't worry; be happy!' The US current account problem has been solved, because it never existed, and with it a sizeable chunk of global imbalances. I aim to show that the arguments and data used by H&S to reach this remarkable conclusion do not stand up to close and critical scrutiny.

2. The World According to Hausmann and Sturzenegger

H&S start by noting that, according to the data provided by the Bureau of Economic Analysis (BEA), the US had, in 1980, net foreign assets of US$365bn[1] and net foreign investment income – profits, dividends, interest, etc. – of US$30bn.[2] Cumulative current account deficits between 1980 and 2004 were US$4.5tn. Yet the US net foreign factor income in 2004 was still US$30bn (see Table 1).

The change in the value of the nation's net external assets is the sum of the current account balance and the capital gains incurred on the outstanding stock of external assets of the US minus the capital gains enjoyed by foreign owners on the outstanding stock of foreign liabilities of the US—the valuation component. The cumulative current account deficit between 1980 and 2004 brings the value of the US net external liabilities at historical cost to US$4.3tn. Comparing the changes in the net international investment position between 1980 and 2004 at historical cost and at market value (assuming that the 1980 market value figure is indeed US$365bn), we see that the US

1. There is no Market Value figure for 1980 provided by the BEA. The US$365bn figure cited by H&S is close to the US$360.8bn figure provided by the BEA for the Net International Investment Position at Current Cost in 1980.

2. H&S appear to use the figures given in my Table 1 column 6, Net Foreign Income Receipts, rather than those in Table 1 column 7, Net Foreign Investment Receipts. Net Foreign Income Receipts includes net employee compensation, which is not a form of capital income. Fortunately, the differences between Net Foreign Income Receipts and the series they should have used, Net Foreign Investment Income Receipts, are rather small.

Table 1: Selected U.S. External Accounts Data 1980-2004
(US$bn unless otherwise noted)

1	2a	2b	3	4	5a	5b	6	7	8
	Current Account Balance		Net International Investment Position (year-end)				Net Foreign Income	Net Foreign Investment Income	Statistical Discrepancy
		%GDP	Historical Cost	Current Cost	Market Value				
						%GDP	Receipts*	Receipts	
1980	2.3	0.1	137.2	360.8	NA	NA	30.1	30.1	20.9
1981	5.0	0.2	142.3	339.8	NA	NA	32.9	32.9	21.8
1982	-5.5	-0.2	136.7	329.0	236.0	7.3	35.2	35.2	36.6
1983	-38.7	-1.1	98.0	298.3	257.4	7.3	36.4	36.4	16.2
1984	-94.3	-2.4	3.7	160.7	134.1	3.4	35.1	35.1	16.7
1985	-118.2	-2.8	-114.5	54.3	96.9	2.3	25.7	25.7	16.5
1986	-147.2	-3.3	-261.7	-36.2	100.8	2.3	15.5	17.3	28.6
1987	-160.7	-3.5	-422.3	-80.0	50.5	0.1	14.3	15.6	-9.1
1988	-121.2	-2.4	-543.5	-178.5	11.5	0.2	18.7	19.5	-19.3
1989	-99.5	-1.8	-643.0	-259.5	-47.0	-0.9	19.8	21.1	49.6
1990	-79.0	-1.4	-721.9	-245.3	-164.5	-2.8	28.6	30.8	25.2
1991	2.9	0.0	-719.0	-309.3	-260.8	-4.4	24.1	26.9	-44.8
1992	-50.1	-0.8	-769.1	-431.3	-452.3	-7.1	24.2	27.2	-45.6
1993	-84.8	-1.3	-853.9	-307.0	-144.3	-2.2	25.3	28.6	4.6
1994	-121.6	-1.8	-975.5	-323.4	-135.3	-1.9	17.1	21.1	-3.7
1995	-113.7	-1.5	-1089.2	-458.5	-305.8	-4.1	20.9	25.0	28.3
1996	-124.9	-1.6	-1214.1	-495.1	-360.0	-4.6	22.3	26.4	-12.2
1997	-140.9	-1.7	-1355.0	-820.7	-822.7	-9.9	12.6	17.0	-79.4
1998	-214.1	-2.4	-1569.1	-895.4	-1070.8	-12.2	4.3	8.8	145.0
1999	-300.1	-3.2	-1869.1	-766.2	-1037.4	-11.2	13.9	19.1	68.8
2000	-416.0	-4.2	-2285.1	-1381.2	-1581.0	-16.1	21.1	25.7	-69.5
2001	-389.5	-3.9	-2674.6	-1919.4	-2339.8	-23.1	25.2	30.3	-9.6
2002	-475.2	-4.5	-3149.8	-2107.3	-2455.1	-23.5	10.0	15.5	-23.7
2003	-519.7	-4.7	-3669.5	-2156.7	-2372.4	-21.6	46.3	51.8	-37.8
2004	-668.7	-5.7	-4337.6	-2484.2	-2542.2	-21.7	30.4	36.2	85.1

Sources: Bureau of Economic Analysis: Landefeld and Law son (1991)

* Column 6 is Column 7 plus net employee compensation received.

benefited from US$1.6tn of net capital gains over the period, or about 13.6% of US 2004 GDP. This puts the 2004 value of US net external liabilities at US$2.5tn. Gourinchas and Rey (2005) show that movements in the valuation component match the large swings in the US Dollar exchange rate. The US Dollar depreciations after 1985 and from the second quarter of 2002 till the end of 2004, are associated with an significant increase in the valuation component. Between 1995 and 2003, a period of US Dollar appreciation, the valuation component was small. H&S then point out the paradox of the US receiving US$30bn-worth of net foreign investment income both in 1980, with net external assets of US$365bn, and in 2004, with net external liabilities of US$2.5tn.[3]

So far so good. Things start to go wrong when H&S attempt to resolve the paradox of the positive US net foreign investment income balance and the negative US net external asset position by making a number of arbitrary and often counterfactual assumptions.

First, they assume that the official net foreign investment income data can be trusted; indeed, the issue of their quality and reliability is never raised. Second, they assume that the trade balance data and the data on foreign assets and liabilities cannot be trusted. These data are not just inaccurate (a fate shared by all data) but systematically biased. H&S assert that past and present official current account data have failed to record a stream of unconventional service exports. The three key unrecorded invisible exports (whose cumulated value is the wonderfully named stock of dark matter) are global liquidity services, insurance services and knowledge services. The reason these services, which from an economic viewpoint should have been recorded in the current account as exports, went unrecorded, is that these liquidity, insurance and knowledge services were bundled with financial instruments: US currency, US sovereign debt and US-originated FDI. These services left the country not through the current account but through, or rather, hidden in, the capital account. The value of these services was not recorded either with the capital outflows they were bundled with – they therefore do not show up in the historical cost data for the US net international investment position. What is more, their contributions to present and anticipated future profitability are not reflected properly in the market value data either. The reason for this will be discussed below. Once abroad, however, these services did and do produce earnings for the issuers of the financial instruments with which they were bundled. In time this showed up as foreign investment income.

3. See footnote 2.

H&S go further than a qualitative statement about the existence of dark matter – net foreign assets that are not properly valued in the market value data. They provide an estimate of its magnitude. They apply an *arbitrary* and *constant* price to earnings (P/E) ratio of 20x to the net foreign investment income of the US in each year since 1980 to obtain an estimate of the true, 'fair value' or 'fundamental value' net US external asset position.[4] [5] For 2004, the assumed P/E ratio gives US net external assets of US$600bn.[6] When contrasted with the official figures of US$2.5tn-worth of net external liabilities at market value, the stock of dark matter in 2004 therefore amounts to US$3.1tn.

The position of H&S that the US has been so good at exporting dark matter that the conventionally measured current account deficit is irrelevant, is diametrically opposed to another – somewhat more conventional, but equally misguided – view (see Feldstein (2006)), on why the US current account deficit is not a problem. This is that the current account deficit of the US is the unavoidable statistical counterpart of its capital account surplus – a surplus that is the result of the superior growth prospects and the irresistible investment climate of the US economy since the mid 1990s. Current account deficits of a magnitude that would have raised eyebrows if they were generated by the slow-growing Eurozone (or by the US during its non-dynamic decades of the 1970s and 1980s) are easily financed by an economy with the growth performance and prospects of the 'new' US economy.

While more conventional than the dark matter hypothesis as a rationalisation of why continuing large US current account deficits are no cause for concern, the proposition that these current account deficits simply accommodate foreign investors desperate to get a foothold in this North American "tiger" economy is equally hard to defend. The hypothesis applies to FDI flows, rather than to capital flows in general. US FDI has been a two-way street for the entire period 1980-2004 (see Table 3). Since 1995, net US FDI flows have moved around dramatically, responding to cyclical forces and relative P/E ratios. Also, as shown in Table 3, gross FDI inflows over the past decade have not grown at a faster rate overall than gross FDI outflows. In addition, when one considers private-sector, long-term net capital flows, the US has moved into deficit since 2002. The financing of the US current account is therefore increasingly dependent on 'hot money', private and public.

3. The Real World

The two driving forces of the quest for dark matter by H&S are, first, their faith in the net foreign investment income data and, second, their inappropriate application of the in principle (given an appropriate take on the word 'consistently') uncontroversial proposition "…that if an asset consistently pays more than another asset, then it is worth more, even if they both have the same historical cost of "book value"". Without dark matter, the H&S argument goes, the US could only generate the positive net foreign investment income figures if it were the beneficiary of two persistent and significant asset market anomalies: first, the risk-adjusted cost of borrowing is lower for the US than for the rest of the world; second, the risk-adjusted rate of return on US direct investment abroad is higher than the risk-adjusted rate of return on direct investment in the US by the rest of the world. A significant and sustained difference in risk-adjusted rates of return of this nature would suggest major financial market inefficiency, indeed a first-order financial market failure. H&S argue that this is not the case. Instead, the apparent risk-adjusted excess returns earned on US assets and the apparent risk-adjusted cost advantage of US external borrowing reflect the payment for non-pecuniary services yielded by US investment abroad or attached to US external liabilities.

Dark matter category A: global liquidity services. An unambiguous example of borrowing by the US at a below-market cost is the seigniorage earned on the stock of US currency held abroad. A 1998 estimate by Federal Reserve Board staff suggests that 'As much as two-thirds of all Federal Reserve notes in circulation – perhaps US$250 to US$300bn - are now held abroad' (Allison (1998, p.1); see also Doyle (2000), Rogoff (1998) and Drehman et al. (2002)). Kenneth Rogoff (2002) reports estimates of between 30% and 75% for the share of US currency held abroad. The BEA itself reports foreign holdings of US currency at the end of 2004 as just under US$333bn.[7]

There are two reasons why the currencies of some major countries (especially the US Dollar since World War II) are used as stores of value and media of exchange outside the US. Dollar currency, despite earning no interest, is a superior store of value in countries with unstable domestic currencies and histories of high inflation or even hyperinflation. Apart from this, the only significant foreign demand for Dollar currency, especially for the larger denominations, comes from the grey, black and other outright criminal sectors of the economy, attracted by the anonymity of the holder of currency – a negotiable bearer bond.[8]

4. Taking H&S's own figures, the PE ratio in 1980 actually was about 12.2. It is of course possible that the net foreign assets of the US were already understated in 1980, presumably because of earlier Dark Matter exports by the US.

5. Fair value or fundamental value is the value of the uncertain future stream of payments, discounted using the appropriate risk-adjusted discount factors.

6. It would have been US$724bn if the Net Foreign Investment Income figure had been taken from Table 1 column 7, as it should have been.

7. BEA (2005a), Table 2, International Investment Position of the United States at Year-End, 1976-2004.

8. An unknown but no doubt large share of the stock of US Dollar currency held domestically is also held to finance criminal activities or to park the proceeds from such activities. This can be inferred from the fact that, with a population in 2004 of just over 292m, and with domestically held US currency (on the BEA's own estimate) of US$367bn, per capita holdings of currency in the US were US$1,257. This includes children, infants and the incarcerated population.

Currency is an interest-free, irredeemable (perpetual) loan to the US authorities. The stock of currency during 2004 was US$700bn (in 1980 it was US$115bn). Using Rogoff's highest estimate of the share of US currency held abroad – 75%, this represents an interest-free irredeemable foreign loan to the US authorities of US$525bn in 2004 (US$86bn in 1980). If the proceeds of this interest free external loan are invested in assets yielding a rate of return of 5% (the number H&S play with), there would have been an annual return of US$26.3bn in 2004 (US$4.3bn in 1980). If the foreign-owned share of US currency were as low as 30%, the interest-free foreign loan would be US$210bn in 2004 (US$34bn in 1980), with associated annual returns of US$10.5bn in 2004. The BEA's own estimate would put the annual return to the US at US$16.7bn.

Another way to make the same point is to ask in what sense US currency is a liability of the US government. There can be no doubt that currency is an asset to its holder, as long as the value - the purchasing power - of the currency has not gone to zero (as happened to the Reichsmark at the end of the German hyperinflation in 1923). However, to its issuer this 'liability' carries a zero nominal interest rate and is irredeemable – the holder of US$20-worth of US currency has no other claim on the US authorities than the US$20-worth of US currency she holds: there is no claim for interest payments, no claim for the ultimate repayment of principal, and no claim on the US authorities for the performance or provision of any non-pecuniary services. To the issuer, currency is like a zero coupon perpetuity—it has a value of zero. US currency held abroad is therefore not in any meaningful sense a US liability. This permits us to reduce the net external indebtedness of the US by somewhere between US$525bn and US$210bn, with the BEA's own estimate just below the middle of that range at US$333bn. This indeed is dark matter.

From these estimates of US currency held abroad would have to be subtracted an unknown amount of foreign currency held in the US. The BEA does not report US holdings of foreign currency.[9] It is likely that the share of Euro currency held outside the Eurozone is non-negligible and increasing, and that some of this is held in the US. In much of central and eastern Europe and Northern Africa, the Euro has replaced or is in the process of replacing the US Dollar as the favoured informal and black economy vehicle currency and liquid store of value. One reason the Euro is likely to be increasingly effective as a competitor to the US Dollar in the financing of grey economy, black economy and other outright criminal activities is that Euro currency comes in €250 and €500 denominations, while in the US, no Federal Reserve notes with denominations over US$100 are issued.[10]

As regards the first of the three dark matter categories of H&S, the net stock of seigniorage dark matter in 2004 was almost certainly less than US$500bn and could have been less than US$200bn – not trivial but a long way short of the US$3.1bn they are looking for.

Dark matter category B: insurance. The insurance argument is an attempt to extend the logic of the global liquidity argument to a much wider class of financial instruments and securities than US currency.

It is possible, indeed likely, that some bank accounts offered by US banks to foreign account holders offer a financial rate of return below the risk-adjusted market rate of return. Likewise, certain loans made by US banks to foreign borrowers earn a rate of return above the risk-adjusted market rate. The reason is that banks often provide their account holders and borrowers with a variety of other financial services that are not priced and charged for separately, but instead are paid for by the depositors through a below-market risk-adjusted rate of return and by the borrowers through an above-market risk-adjusted loan rate. For instance, a deposit with a bank or a loan from a bank can be part of a continuing relationship between the bank and the depositor or borrower. Both bank depositors and bank borrowers pay for the option value of continued association with the bank. For reasons that are not entirely clear, these payments are rolled into the interest rate on deposits or into the bank's loan rate, rather than being itemised in their own right.

With the explosive growth of the securitisation of bank loans on the one hand, and the emergence of checkable money market funds and similar portfolios of checkable tradable securities that are close substitutes for bank deposits, the relationship dimensions of bank deposits and bank loans are becoming less important. Any dark matter premium that may have been associated with relationship banking is likely to have shrunk quite a bit since the early 1980s. Note that the arguments supporting the existence of relationship premia in interest rates on bank deposits and bank loans apply not just to US(-owned) banks and their foreign customers but also to foreign(-owned) banks and their US customers.

H&S aim to include all US Federal debt held abroad in a category of US external liabilities that can be issued at a risk-adjusted rate of return well below what the US can earn on investments in emerging markets, as the following quote from their article makes clear:

"… consider the US borrowing abroad at rate of 5% (say through a Treasury bond) and then using the proceeds to buy a portfolio of debt from emerging markets which earns ex post (even after defaults) a return of 8 percent. This return persists because the world is exchanging a

9. The data it does provide on "US foreign currency holdings and US short-term assets", are a sub-category of "US Government assets, other than official reserve assets", which amounted to a paltry US$2.8bn in 2004. This excludes any foreign currency held by the US private sector.

10. There is still an outstanding stock of US$500 and US$1,000 notes.

safe asset (the Treasury bond) for a risky asset (Emerging market debt). The difference between the two rates of returns is the insurance premium the world is willing to pay for lowering its risk. Dark matter thus includes the selling of unaccounted insurance, which generates a premium." Hausmann and Sturzenegger (2005, p. 5)

If the ex-post or realised rate of return on emerging market (US dollar-denominated) debt were to be always 8% while the US government borrows at 5%, the US would have a 'money machine' – evidence of a major failure of financial market efficiency. The H&S argument that this would not be an example of financial market failure because US Treasury Securities come bundled with insurance services for which the 3% (apparent) excess return is the service charge is fatally flawed.

It is true that US dollar-denominated Treasury debt is as close to free of default risk as makes no difference. US dollar-denominated debt instruments issued by the Argentine government in the 1990s were generally perceived not to be free of default risk and were priced accordingly. The Argentine sovereign default of November/December 2001 confirmed the appropriateness of a positive ex-ante premium of the contractual yields on Argentine sovereign debt over US sovereign debt. US Treasury debt yields a safe stream of US Dollar coupon payments over time and a safe redemption value. That's all. There are no mysterious insurance services or options on a continued close relationship with the US Treasury bundled with the holding of US Treasury debt. There is therefore nothing that allows US Treasury debt to be offered at a lower risk-adjusted yield than Argentine or other emerging market debt that offers the same contractual stream of US Dollar coupon payments and redemption value, but is subject to default risk.

There is no evidence – certainly none is offered by H&S – that the ex-post yield on emerging market debt has been systematically above that on US sovereign debt, over and above what is already reflected in the market value BEA data.

Defaults on emerging market sovereign debt are common and always have been. Over the past two centuries, according to Standard & Poor's, more than 90 countries (including a number of today's advanced industrial countries) have defaulted on or rescheduled their debt. Several countries have done so many times. Reinhart, Rogoff and Sevastano (2003) identify over 100 countries with 'credit events' since 1820. The London and Paris Clubs are not likely to go out of business anytime soon.

While not every sovereign default is as spectacular and devastating as the November-December 2001 Argentine default (the largest sovereign default in recorded history), which left holders of US$81bn of Argentine sovereign debt with around 25 cents on the Dollar, the list of recent rated bond defaults by sovereigns is long and includes some current market favourites – memories in financial markets are short: Pakistan, Russia and Venezuela in 1998, Ukraine in 1998 and 2000, Ecuador in 1999, Peru in 2000, Moldova in 2001 and 2002, and Uruguay in 2003 (see Packer (2003)).

Add to this the exposure of the US government, through its membership and share ownership in the IMF, World Bank and Regional Development Banks, to some of the world's poorest non-performing (and non-rated) debtors (e.g. those included in the HIPC initiative), and the picture of systematic ex-post excess returns or ex-ante risk-adjusted excess return on emerging market debt over US sovereign debt becomes even less convincing.

Indeed, in recent years, the opposite may well have been the case. Recent ex-ante spreads between US Treasuries and emerging market debt appear barely sufficient (some would say quite insufficient) to compensate for the likelihood of default on some of these emerging market debt instruments. Spreads are so tight they appear to leave no room for a conventional risk premium, reflecting the securities covariation with 'the market'. There certainly is no spread left to reward the insurance services allegedly bundled with US Treasuries. There is no dark matter driving a wedge between the yield on US Treasury debt and the yield on emerging market debt.[12]

Table 2 is no substitute for serious statistical analysis of the presence or absence of excess returns, but is illustrative of the exceedingly small spreads we have seen for a number of years now.

Table 2: Emerging Market Spreads vs US (December 2005)

Country	Spread vs US (%)
Ukraine	1.98
Mexico	0.97
Brazil	2.16
Turkey	2.22
Peru	2.54
South Africa	1.02
Philippines	3.15
Colombia	2.74
Venezuela	2.70
Russia	0.91
Ecuador	6.18
Argentina	0.88

Source: Financial Times Thursday January 12, 2006.

11. This underpricing of risk is not confined to the sovereign default risk spreads but applies to virtually every form of risk priced in the markets.

12. The US is of course not the only country whose sovereign borrows at home and abroad on terms reflecting the absence of default risk. Most OECD nations that are not emerging markets fall into that category. Because these other default risk-free sovereigns tend to borrow using debt denominated in their own currencies rather than in US dollars, easy comparisons of the cost of borrowing cannot be made because of the presence of exchange rate risk. However, it is hard to make the argument that US sovereign debt has a lower yield than, say, UK or French government debt. Indeed, US index-linked yields today are higher than those in the UK, France or Canada. The insurance argument fails for the sovereign debt of these other countries as it fails for the US.

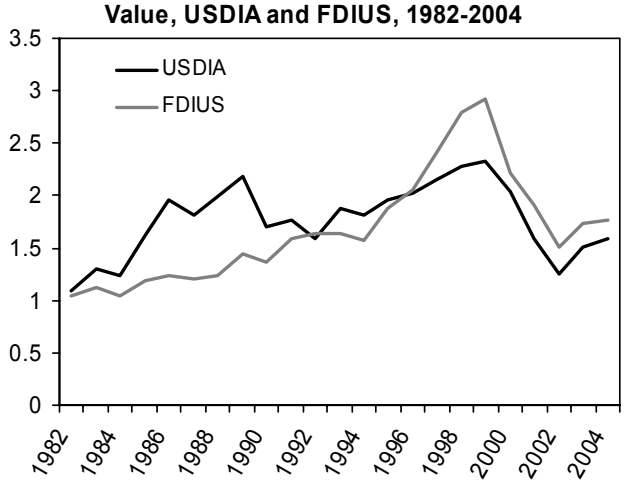
The fair value or fundamental value of some of the emerging market assets held in US portfolios could well be less than the value implied by the low spreads shown in Table 1. There could be some negative dark matter – or dark anti-matter – in the US external balance sheet.

'To the extent that balance of payments data are presented, consistent with the national accounts conventions, on an *accrual* basis rather than a *cash* basis, the following issue arises. High contractual interest payments to US owners of emerging market debt (reflecting perceived default risk) accrue and are presented as a credit on the foreign investment income account even when the debt is non-performing and the interest is not paid. Any write-offs of accumulated interest arrears on non-performing debt will show up not as a debit in the foreign investment income account but as a debit in the capital account.[13]

To determine the interest income actually paid to and received by US holders of high-yielding emerging market debt, the write offs of accumulated interest rate arrears should be netted against the high contractual interest payments recorded in the investment income account. This does not happen. How large a bias does this create in recorded foreign investment income as a measure of interest actually paid and received? Capital account data are only available since 1982. For the period 1982-2004, the cumulative capital account balance is -US$28.7bn. Unfortunately, because the capital account contains items other than write offs of interest arrears, this number provides neither a lower limit nor an upper limit to the write-off of net cumulative interest arrears

The Peso paradox. During periods when default does not actually occur, but when the possibility of a default occurring is appropriately reflected in the contractual or secondary market yields on the risky debt instruments, realised (ex-post) returns on risky debt instruments are higher than the expected (ex-ante) return on these instruments. If default is both unlikely to occur and very devastating when it does occur (say, 25 cents on the Dollar), there may be extended periods during which the risky instrument appears to yield systematically higher returns than the risk-free instrument. Looking at ex-post rate of return differentials over relatively short runs of years can result in the observer falling victim to the so-called 'Peso paradox'. During years preceding the 1976 and 1982 devaluations of the peg of the Mexican Peso to the US Dollar, the Peso consistently stood at a forward discount to the Dollar. Every test of Uncovered Interest Parity was rejected. During the period when the low-probability disaster – the collapse of the Dollar peg of the Peso – did not occur, everyone borrowing US dollars and investing in Peso securities made 'excess ex-post returns'. Until the day the peg broke and the Peso crashed. Similar sad tales can be told about the experiences of US investors (and investors from many other nations) in Argentina, in Russia, in Ukraine, in Mexico (1982), in Peru, in the former Yugoslavia, to name a few.

Chart 1: Ratio of Market Value to Historical Value, USDIA and FDIUS, 1982-2004



A 'Peso paradox' may in part explain why net US external debt is so much smaller at market value than at historical cost. (Note that this has nothing to do with dark matter - dark matter concerns unrecorded capital gains over and above the US$1.6tn capital gains recorded between 1980 and 2004 in Table 1). If the Peso paradox has been at work and the unfavourable contingency (sovereign default in one or more emerging markets) has not (yet) occurred, the beneficiary (the US investor) can indeed, ex-post, chalk up as gains the realised excess returns that have been earned thus far. Looking forward, however, these high past ex-post returns should not be taken as a guide to future expected returns, if the likelihood of the adverse contingency has not changed. To assume, as H&S do, that the US can confidently expect to earn systematic positive excess returns on its investments in emerging market debt would be a recipe for disaster: even if the Peso paradox worked in the past, the ex-post returns it generated cannot be a guide to the future!

Because there is no dark matter to provide an explanation for a risk-adjusted ex-ante excess return (or a sustained ex-post excess return) on emerging market debt over US sovereign debt, H&S's analysis is tantamount to discounting risky returns using a risk-free discount rate.

Dark matter category C: knowledge. The third category of dark matter, knowledge, is associated with US direct investment abroad (USDIA). According to H&S, this has been and continues to be extraordinarily

13. Conventional capital flows are recorded in the financial account. "Along with transactions pertaining to non-financial and non-produced assets, the capital account relates to dealings including debt forgiveness, the transfer of goods and financial assets by migrants leaving or entering a country, the transfer of ownership on fixed assets, the transfer of funds received to the sale or acquisition of fixed assets, gift and inheritance taxes, death levies, patents, copyrights, royalties and uninsured damage to fixed assets" (Investopedia.com; http://www.investopedia.com/articles/03/070203.asp).

Table 3: U.S. FDI Assets and Liabilities 1980 – 2004
(US$bn)

	USDIA			FDIUS			NUSDIA		
1	2a	2b	2c	3a	3b	3c	4a	4b	4c
	Historical Cost	Current Cost	Market Value	Historical Cost	Current Cost	Market Value	Historical Cost	Current Cost	Market Value
1980	NA	388.1	NA	NA	127.1	NA	NA	261.0	NA
1981	NA	407.8	NA	NA	164.6	NA	NA	243.2	NA
1982	207.8	374.1	226.6	124.7	184.8	130.4	83.1	189.2	96.2
1983	212.2	355.6	274.3	137.1	193.7	153.3	75.1	161.9	121.0
1984	218.1	348.3	270.6	164.6	223.5	172.4	53.5	124.8	98.2
1985	238.4	371.0	386.4	184.6	247.2	220.0	53.8	123.8	166.4
1986	270.5	404.8	530.1	220.4	284.7	273.0	50.1	120.1	257.1
1987	326.3	478.1	590.2	263.4	334.6	316.2	62.9	143.5	274.1
1988	347.2	513.8	692.5	314.8	401.8	391.5	32.4	112.0	300.9
1989	381.8	553.1	832.5	368.9	467.9	534.7	12.9	85.2	297.7
1990	430.5	616.7	731.8	394.9	505.3	539.6	35.6	111.3	192.2
1991	467.8	643.4	827.5	419.1	533.4	669.1	48.7	110.0	158.4
1992	502.1	663.8	798.6	423.1	540.3	696.2	79.0	123.6	102.5
1993	564.3	723.5	1061.3	467.4	593.3	768.4	96.9	130.2	292.9
1994	612.9	786.6	1114.6	480.7	618.0	757.9	132.2	168.6	356.7
1995	699.0	885.5	1363.8	535.6	680.1	1005.7	163.4	205.4	358.1
1996	795.2	989.8	1608.3	598.0	745.6	1229.1	197.2	244.2	379.2
1997	871.3	1068.1	1879.3	681.8	824.1	1637.4	189.5	243.9	241.9
1998	1000.7	1196.0	2279.6	778.4	920.0	2179.0	222.3	276.0	100.6
1999	1216.0	1414.4	2839.6	955.7	1101.7	2798.2	260.3	312.7	41.4
2000	1316.2	1531.6	2694.0	1256.9	1421.0	2783.2	59.3	110.6	-89.2
2001	1460.4	1693.1	2314.9	1344.0	1518.5	2560.3	116.4	174.7	-245.4
2002	1616.5	1860.4	2022.6	1344.7	1517.4	2027.4	271.8	343.0	-4.8
2003	1791.9	2062.6	2718.2	1410.7	1585.9	2457.2	381.2	476.7	261.0
2004	2064.0	2367.4	3287.4	1526.3	1708.9	2686.9	537.7	658.5	600.5

Source: BEA, Direct Investment Positions for 2004, July 2005
BEA, Direct Investment Positions for 2004, Country and Industry Detail, by Jennifer L. Koncz and Daniel R. Yargason, July 2005

productive and profitable because of the unique technical and managerial skills and knowledge that come bundled with these investments. As a result the cumulated historical value of these FDI flows is often but a small fraction of the fair value or fundamental value today of the equity claims on the assets they created abroad. The argument is plausible, although putting a firm figure on it is a huge and daunting challenge, addressed by H&S by assuming a constant P/E value of 20x.

For the US, FDI is a two-way street, however. Over the past 25 years, foreigners have been engaged in FDI in the US on a large scale. This raises a number of questions:

Did this FDI in the US not benefit from the wealth of talent, knowledge, know-how, skills and technology that make the US the most productive economy in the world?

Are foreign entrepreneurs and corporate managers undertaking FDI in the US selected for their ineffectiveness in spotting good profit opportunities?

Does the historical cost of foreign direct investment in the US understate the fair value of the assets it created by less than the historical cost of outward US direct investment abroad understates the fair value of the assets thus created?

No evidence is presented by H&S to support a positive answer to any of these three questions.

What do the available data say and how loudly and clearly do they speak?

Table 3 shows three different measures each of the gross stock of US direct investment abroad (USDIA), the gross stock of foreign direct investment in the US (FDIUS) and the net stock of US direct investment abroad (NUSDIA = USDIA – FDIUS).

Between 1982 and 2004, the market value measure of the stock of USDIA increased 14.5-fold; the corresponding measure for FDIUS increased 20.6-fold. Over the same period, the historical cost measure of the stock of USDIA increased 9.9-fold while the historical cost measure of the stock of FDIUS increased 12.2-fold. Chart 1 shows the ratio of market value to historical value for the stocks of USDIA and FDIUS. Until the mid-1990s the ratio of market value to book value was higher for USDIA, but since then it has been slightly higher for FDIUS. Taken at face value, Chart 1 does not support the view that US

direct investment abroad has been much more profitable than foreign direct investment in the US, at least as regards anticipated future profits, whose suitably discounted value is presumably reflected in the market value data.

Unfortunately, of the three FDI measures, the most important one, the market value measure, is by far the least reliable. The historical-cost valuation (or book value) measures the cumulative value of the FDI flows recorded in the balance of payments statistics. They are the most accurate of the three, but the least interesting from an economic and business perspective. The current-cost method values the US and foreign parents' shares of their affiliates' investment in plant and equipment, using the current cost of capital equipment; in land, using general price indexes; and in inventories, using estimates of their replacement cost. Current cost valuation tells you what it would cost you today to buy the same physical assets that you bought initially – the denominator of "Tobin's *q*."

The market valuation aims to measure the owners' equity portion of the direct investment positions, that is, the cumulative total of equity capital flows, net intercompany debt outflows, reinvested earnings and valuation adjustments to equity. Market value captures, if the equity market is efficient, the present discounted value (using the appropriate risk-adjusted discount rates) of the future profits generated by the investment – the numerator of "Tobin's q" if the investment is wholly equity-financed. It is the measure that matters if we want to establish the gross and net claims the US has on the rest of the world.

In the case of FDI, 'market valuation', is a bit of a misnomer. As the BEA points out, "…direct investment positions typically involve illiquid ownership interests in companies that may possess many unique attributes – such as customer base, management, and ownership of intangible assets – whose values in the current period are difficult to determine, because there is no widely accepted standard for revaluing company financial statements at historical cost into prices of the current period" (Nguyen (2005)). There exists nothing approximating a market valuation for the vast majority of enterprises and other assets created/acquired through FDI. FDI equity is typically unlisted and not traded on organised exchanges. This is true both for brown-field and green-field FDI projects. The BEA cuts the Gordian knot of calculating the market value of FDI assets for which there exists no market value, by assuming that the ratio of current market value to book value of direct investment equity positions in a country is the same as the ratio of the current stock market price of a broad index of portfolio investment securities (for which there is a market price) to their book value. For FDIUS, the Standard & Poor's Index for 400 Industrial Companies is used. For USDIA, stock market data from Morgan Stanley Capital International are used to revalue US parents' equity in foreign affiliates.

How good is the BEA's bold assumption that the ratio of market value to book value is the same for FDI equity as for portfolio investment securities?

For a country with well-functioning portfolio equity markets (over the period in question this probably includes just the US, the UK and perhaps a few more OECD countries), the ratio to book value of the implicit market value, fair value or fundamental value of direct equity investments is likely be higher than the ratio of market value to book value for portfolio equity investments. The reason is simple. Because direct equity investment involves the acquisition of a controlling ownership share, it comes with control and management rights. These rights are valuable. In addition, direct investment does not just provide financial resources, but tends to come bundled with the transfer of technical knowledge, managerial, entrepreneurial and other skills and know-how, and a valuable network of commercial contacts in the parent's home country and in the other countries where the parent has established subsidiaries or affiliates.

This means that, for inward foreign investment in the US, the ratio of the current stock market price of portfolio investment equity to its book value (which the BEA uses to revalue historical cost direct investment equity positions to current period 'market values'), is likely to lead to an understatement of the fair value of the stock of foreign direct investment in the US. There are many other problems, even in countries with well-functioning stock markets, in finding market benchmarks from among those enterprises whose stock are traded, that are sufficiently comparable (as regards industry, size, age etc.) to be applicable to the non-traded or closely-held FDI-affiliate. In practice the BEA can do little more than close its eyes and punt. This is not a criticism of the BEA; it represents a recognition of the massive, indeed insurmountable, problems it faces in pricing non-traded ownership claims on highly idiosyncratic, unique enterprises.

Where US direct investment abroad is located in countries with well-functioning portfolio equity markets, the same presumption established for FDI in the US holds: the multiple to book value of the market value of portfolio equity investment is likely to understate the multiple to book value of the fair value or fundamental value of the direct investment. However, much of US direct investment abroad has gone to countries that either have underdeveloped, illiquid, non-transparent, distorted, politically manipulated, inefficient and poorly functioning equity markets, or no portfolio equity markets at all. The BRICs all fall, at best, into the former category, and, as regards foreign portfolio investment, China is still close to having no portfolio equity markets at all. Even the EU 15 countries had rather shabby stock markets at the beginning of the 1980s, and today, the depth, breadth and liquidity of the EU15 stock markets remains less than that of their US counterparts. With an illiquid, unrepresentative and distorted portfolio equity investment benchmark, it is anybody's guess whether the

BEA's methodology for calculating 'market value' measures for direct equity investment leads to an overstatement or an understatement of the fair value or fundamental value of direct investment.

The disturbing conclusion is that the market value measures of FDI provided by the BEA are 'made up' or constructed numbers, that is, 'heroic imputations' rather than direct measurements. It is therefore surprising that even among the leading contributors to the discussion on the external indebtedness of the US, there seems to be little or no awareness of the extent of our ignorance about the quality and reliability of these data. For instance, in one of their important contributions, Gourinchas and Rey state that "The BEA data provide equity and FDI (since 1980) figures at market value… ...the quality of the data is good" (Gourinchas and Rey (2005, Appendix, page 31).[14] The simple truth is that no-one has any idea how good or how bad the quality of the market value FDI data is.

Subject to the generalised ignorance caveat of the last paragraph, there is nothing to lead me to believe that the 'market value' net FDI data (NUSDIA, Table 3) are more likely to understate than to overstate the net FDI wealth of the US. If anything, there is a slight presumption that the BEA 'market value' data overstate the net FDI wealth of the US, because it is likely that the FDI liabilities of the US are understated.

4. Can we Trust the Foreign Investment Income Data?

With dark matter reduced to net currency seigniorage and perhaps some unrecorded banking services, there still remains the paradox of data showing the US to be both a persistent and growing net external debtor and a persistent beneficiary of a roughly constant (in nominal terms) flow of net foreign investment income over a 25-year period.

Foreign direct investment in the US as a growth stock. I use the term *paradox* rather than *anomaly* or *contradiction*, because it is certainly possible that the negative US external net worth data are consistent with the positive net US foreign investment income data. A constant P/E ratio is not a law of nature or of economics. Instead of taking the returns on their share holdings through dividends (which are, in principle, recorded in the foreign investment income account), foreign owners of US FDI assets could have taken their returns mainly in the form of capital gains. In other words, the foreign owners of the equity portion of the direct investment positions in the US may have viewed their investments in the US as 'growth stocks'.[15] If this were to be the case, the BEA's 'market value' figures for FDIUS would become progressively more downward biased as an estimate of the fair value of FDIUS, and the market value figures for NUSDIA (Table 3) would become progressively more upward biased as an estimate of the fair value of NUSDIA. Since we don't have direct observations on the fair value of either FDIUS or USDIA, this interpretation is irrefutable and therefore not very interesting, except for underlining the key role played in the discovery by H&S of dark matter, by the assumption of a constant P/E. The steadily rising P/E ratio characteristic of FDIUS as a growth stock would imply a growing stock of negative dark matter or dark anti-matter in the US external balance sheet.

Are there missing US foreign investment income payments? The earnings reported by a foreign affiliate in the US need bear no relation to the true financial contributions made by the affiliate to the consolidated fortunes of parent and affiliate. Typically, the parent is a multinational corporation with non-trivial internal trading and financial relations with the affiliate (and often with many other affiliates located in different jurisdictions). Through transfer pricing and similar mechanisms, accounting profits and accounting earnings can be shifted among the parent and the affiliates almost at will, in response to tax or regulatory incentives. It is true that tax regulations in most countries (including the US) require intra-firm transactions to be at "arms-length" prices. However, objective, market-based benchmarks for determining arms-length reference prices are often lacking when differentiated goods or services are involved. "Transfer pricing" is not restricted to intra-firm trade in current goods and services, but can also distort transactions in existing assets and the terms and conditions of financial transactions (e.g. borrowing and lending) between parent and affiliate.

The BEA is aware of the transfer pricing issue (see e.g. Mataloni (2000)). Mataloni's paper is interesting here because it appears to address a key question in the search for Category C dark matter: "does foreign FDI in the US earn a below-market risk-adjusted rate of return", using firm-level data.[16] The paper argues that the greatest opportunity to shift profits using transfer prices exists for foreign-owned companies with a high percentage of their sales accounted for by intrafirm imports. It finds that the rate of return on assets gap (or ROA gap) – the difference (negative) between the ROA of foreign-owned companies minus the ROA of US-owned companies – was, after controlling for industry mix, market share and

14. In fact, Gourinchas and Rey (2005) note that applying the BEA market valuation adjustment backwards from 1982 Q4 results in a negative gross FDI asset position before 1973. This would suggest that the quality of the BEA FDI market value data may not be all that good. Lane and Milessi Ferreti (2005), in their otherwise excellent paper, also seem to be quite unaware that the FDI market value data have feet of clay.

15. While financial theory supports the view that if you never return cash to the shareholders your stock won't be worth much, it is an open question whether an affiliate could plough back all its earnings for 10 or even 20 years without testing the patience of the shareholders.

16. The title of Mataloni's paper is "An Examination of the Low Rates of Return of Foreign-Owned US Companies". Note that Category C dark matter has been identified only if a negative rate of return gap can be found that is larger in magnitude than is required to account for the behaviour of the BEA's market value measure of FDIUS.

age effects, not significantly correlated with intrafirm-import content.

The conclusion of Mataloni that there is no evidence that transfer pricing seriously distorted the earnings and profit data of subsidiaries of foreign parents is, however, not justified. First, transfer pricing through intrafirm imports can occur not just between parent and subsidiary but also directly between two different subsidiaries of the same parent, located in different jurisdictions from each other and from the parent. The paper did not consider transfer pricing between subsidiaries. Second, the intrafirm-import content measure of the Mataloni paper excludes financial transactions between parent and subsidiary or between subsidiaries of the same foreign parent located in different countries.

The ROA gap identified by Mataloni, while intriguing, is in any case not the ROA gap relevant to the dark matter issue. The dark matter-relevant ROA gap would be that between the return on FDI in the US and US direct investment abroad, not that between foreign-owned and domestically-owned enterprises in the US.

Is it likely that missing foreign investment income payments could be sufficiently large to turn the US$36bn net foreign investment income figure in 2004 into a significantly negative number? Applying H&S's universal constant rate of return (5% per annum) to the BEA's -US$2.5tn estimate of the 2004 market value of the net foreign investment position of the US, would give a -US$125bn net foreign investment income figure, a 'turnaround' of -US$161bn.

Some idea of how big this is can be gauged by comparing it to the magnitude of the annual 'statistical discrepancy' in the balance of payments – errors and omissions in plain language – given in Table 1 column 8. During the 25-year period 1980-2004, the statistical discrepancy ranged between US$145.0bn in 1998 and -US$69.5bn in 2000. Other large positive figures were recorded for 1999 and 2004.

The search for the missing foreign investment income payments is made easier if one believes that at least part of the (assumed) 5% risk-adjusted rate of return on FDI equity was taken in the form of (unrecorded) capital gains rather than as dividend payments. By increasing the fraction of the total return taken as capital gains, one would get progressively closer to the pure FDI growth stock model of Section 4.1, for which there are, by construction, no missing foreign investment income payments left.

Balance of payments conventional wisdom holds that the statistical discrepancy is mainly unrecorded capital inflows (when positive) and outflows (when negative). Given the magnitude of these recognised or admitted errors and omissions, it may not be too much of a stretch to propose the hypothesis that there may have been further significant but offsetting (as regards their impact on the net statistical discrepancy in the balance of payments statistics) unrecorded capital inflows and unrecorded investment income payments abroad. Specifically, affiliates of foreign parents may have re-invested (part of) their earnings in the US without either reporting these earnings as a payment of foreign investment income to the parent or reporting the investment as new foreign direct investment by the parent. These transactions can escape the scrutiny of the balance of payments statisticians very easily if they go through off-balance sheet and off-budget special purpose vehicles set up by the parent and/or the affiliate.

This dark anti-matter hypothesis, in common with the dark matter hypothesis of H&S, has no direct evidence to support it. All data are unreliable. The best we can do is try and get a better sense of just how unreliable, and of the direction and magnitude of any systematic bias.

5. No, Virginia, there is no Santa Claus

No one put US$3.1tn-worth of dark matter in the stocking of the US last Christmas. The argument that, in the conventional market value accounts, the external assets of the US are undervalued and the external liabilities overvalued by anything like that amount is not backed up by Hausmann and Sturzenegger. External seigniorage dark matter from currency issuance is real but accounts for at most one-sixth of the H&S number, and could be much smaller than that. The argument that insurance premium dark matter can rationalise a permanent ex-post excess return on US investment in emerging market debt financed by the issuance of US Treasury bonds, is unsound. There are no (implicit) insurance services bundled with US Treasury bonds. These bonds are fully characterised by their default risk-free contractual cash flows. Without any bundled insurance services, what H&S propose amounts to discounting risky payment streams using risk-free discount rates. The argument that knowledge dark matter is embodied in US direct investment abroad to a greater degree than in foreign direct investment in the US, is not supported by any data. Of the US$3.1tn of dark matter claimed by H&S, I have been able to verify at most US$500bn, and quite possibly no more than something south of US$200bn. In short, Hausmann and Sturzenegger believe they have found dark matter. Instead they have, thus far, found mainly cold fusion.

I expect that in the years to come, the paradox of the US being both a net debtor and a recipient of positive net foreign investment income, will be resolved by net foreign investment income turning negative. In the long run, Peso paradoxes disappear as the low probability but high impact contingencies eventually materialise. Greater cooperation and information sharing between national tax authorities may make it more difficult to engage in transfer pricing and similar practices for

decoupling the jurisdiction generating earnings from the jurisdiction where they are reported.

With the US trade gap in October 2005 widening to a new record US$68.9bn, the US current account deficit is unsustainable. Its correction will require a large depreciation of the real effective US Dollar exchange rate, on reasonable estimates by no less than 30%, and quite possibly by more.

The timing of this event is, alas, uncertain. Herbert Stein's Law states that "If something cannot go on forever, it will stop". While helpful, it is hardly a sufficient guide for sensible portfolio management, as is made clear by two corollaries to Stein's Law due to Rudiger Dornbusch. The first (referring to unsustainable capital inflows) can be paraphrased as "Something that can't go on forever, can go on much longer than you think it will". The second, referring to the eventual correction, can be paraphrased as: "The speed and magnitude of the eventual turnaround will always take you by surprise". One reason behind the first and second corollaries is Ben Friedman's "… Perverse Corollary of Stein's Law", originally applied to unsustainable government budget deficits. This is the view that "…in the presence of large ……. deficits nothing need be done because something will be done." Time will tell.

Willem Buiter

References

Allison, Theodore E. (1998), "Overall impact of euro banknotes on the demand for US currency", Testimony before the Subcommittee on Domestic and International Monetary Policy, Committee on Banking and Financial Services, US House of Representatives October 8; http://www.federalreserve.gov:80/BoardDocs/Testimony/1998/19981008.htm

Blanchard, Olivier, Francesco Giavazzi and F. Sa (2005), "The US Current Account and the Dollar", MIT Working Paper 05-02.

Chinn, M. (2005), "Doomed to Deficits? Aggregate US Trade Flows Re-Examined", Review of World Economics, 141(3).

Cline, W. (2005), "The United States as a Debtor Nation", Institute for International Economics, Washington D.C..

Dooley, M., D. Folkerts-Landau and P. Garber (2004), "The Revised Bretton Woods System", *International Journal of Finance and Economics*, Vol. 9(4), October, pp. 307-313.

Drehmann, M., Goodhart, C. and Krueger, M. (2002). 'The challenges facing foreign currency usage: will traditional transactions medium be able to resist competition from new technologies?', *Economic Policy*, vol.. 17, pp. 193–227.

Feldstein, Martin, "Uncle Sam's bonanza might not be all that it seems", Financial Times, January 10 2006.

Friedman, Benjamin M. (2005), "Deficits and Debt in the Short and Long Run", NBER Working Paper No. 11630, October.

Gourinchas, P. O. and H. Rey (2005), "From World Banker to World Venture Capitalist: US External Adjustment and the Exorbitant Privilige", NBER Working Paper No. 11563, August.

Hausmann, Ricardo and Frederico Sturzenegger (2005), "US and Global Imbalances: Can Dark Matter Prevent a Big Bang?"

http://www.cid.harvard.edu/cidpublications/darkmatter_051130.pdf

Kozlov, Ralph (2002), "Valuing the Direct Investment Position in US Economic Accounts", paper presented at the Fifteenth Meeting of the IMF Committee on Balance of Payments Statistics, Canberra, October 21-25, 2002.

Landefeld, J. Steven and Ann M. Lawson (1991), "Valuation of the US net International Investment Position", *Survey of Current Business*, May 1991, pp. 40-49.

Lane, P. and G. M. Milessi Ferreti (2005), "A Global Perspective on External Positions", NBER Working Paper No. 11589, September.

Mann, Catherine L. (2002), "Perspectives on the US Current Account Deficit and Sustainability", *Journal of Economic Perspectives*, vol. 16 (Summer), pp.131-52.

Mataloni Jr., Raymond J. (2000), "An Examination of the Low Rates of Return of Foreign-Owned US Companies", *Survey of Current Business,* March, pp. 55-73.

McKelvey, Ed (2005), "'Dark Matter' in US International Transactions?", Goldman Sachs Economics Research, US Economic Analysis, Issue No: 05/50, December 16, 2005.

Nguyen, Elena L. (2005), "The International Investment Position of the United States at Yearend 2004", July 2005).

Obstfeld, M. and K. Rogoff (2005), The Unsustainable US Current Account Revisited", NBER Working Paper No. 10864.

O'Neill, Jim and Jan Hatzius (2002), "US Balance of Payments – Still Unsustainable,", Goldman Sachs, Global Economics Paper No: 70, 11 March..

O'Neill, Jim and Jan Hatzius (2004), "US Balance of Payments. Unsustainable, But…", Goldman Sachs, Global Economics Paper No: 104, 10th March.

Packer, Frank (2003), "Mind the gap: domestic versus foreign sovereign currency rating", *BIS Quarterly Review*, September, pp. 55-63.

Reinhart, Carmen M., Kenneth S. Rogoff, and Miguel A. Savastano (2003), "Debt Intolerance", NBER Working Paper No. 9908, August.

Rogoff, Kenneth S.(2002), "The Surprising Popularity of Paper Currency" *Finance and Development*, March 2002, Volume 39, Number 1.

Roubini, Nouriel and Brad Setser (2004), "The US as a Net Debtor: The Sustainability of the US External Imbalances", unpublished paper, unpublished paper.

Recent Global Economic Papers

Paper No.	Title	Date	Author
135	German Manufacturing Will Survive EU Enlargement	09-Dec-05	Dirk Schumacher
134	How Solid are the BRICs?	01-Dec-05	Jim O'Neill, Dominic Wilson, Roopa Purushothaman and Anna Stupnytska
133	China's Ascent: Can the Middle Kingdom Meet Its Dreams?	11-Nov-05	Hong Liang and Eva Yi
132	60 Is the New 55: How the G6 Can Mitigate the Burden of Aging	28-Sep-05	Sandra Lawson, Roopa Purushothaman and David Heacock
131	Is Foreign Direct Investment An Engine for Economic Growth?	16-Sep-05	Binit Patel, Mónica Fuentes and Anna Stupnytska
130	What Italy Needs to Do	14-Sep-05	Kevin Daly and Inês Calado Lopes
129	China and Asia's Future Monetary System	12-Sep-05	Jim O'Neill
128	The Impact of Pension Reform on the Capital Markets	08-Sep-05	Dambisa F. Moyo
127	The "ABC" of Asia's FX Regime Shift	01-Sep-05	Sun-Bae Kim and Tetsufumi Yamakawa
126	Europe: Challenged by Globalisation	13-Jul-05	Erik F. Nielsen and Nicolas Sobczak
125	Inflation Targeting —The Case for More?	15-Jun-05	Jim O'Neill
124	Merging GSDEER and GSDEEMER: A Global Approach to Equilibrium Exchange Rate Modelling	16-Apr-05	Jim O'Neill, Alberto Ades, Hina Choksy, Jens J. Nordvig and Thomas Stolper
123	Africa's Long Road Ahead: Laying Down the Potential	14-Mar-05	Carlos Teixeira, Roopa Purushothaman and Mike Buchanan
122	Germany Profits From Restructuring	24-Feb-05	Dirk Schumacher
121	The Lisbon Strategy and the Future of European Growth	21-Jan-05	Kevin Daly
120	Thoughts on Social Security Reform	18-Jan-05	William C. Dudley, Edward F. McKelvey and Jan Hatzius
119	Can the G7 Afford the BRICs Dreams to Come True?	30-Nov-04	Jim O'Neill
118	The BRICs and Global Markets: Crude, Cars and Capital	14-Oct-04	Dominic Wilson, Roopa Purushothaman and Themistoklis Fiotakis
117	US Consumers: Living Beyond Their Means	01-Oct-04	Jan Hatzius
116	Bush vs. Kerry: Budget Deterioration Limits the Scope for New Policy Initiatives	17-Sep-04	William Dudley, Ed McKelvey, Alec Phillips and Chuck Berwick
115	Making the Most of Global Migration	06-Aug-04	Sandra Lawson, Roopa Purushothaman and Sabine Schels
114	House Prices: A Threat to Global Recovery or Part of the Necessary Rebalancing?	15-Jul-04	Mike Buchanan and Themistoklis Fiotakis
113	South Africa: Capital Controls Constraining Growth	15-Jul-04	Carlos Teixeira, Rumi Masih and Jim O'Neill
112	The G8: Time for a Change	03-Jun-04	Jim O'Neill and Robert Hormats
111	Introducing the Goldman Sachs China Financial Conditions Index (GS China-FCI)	19-May-04	Sun-Bae Kim, Hong Liang and Enoch Fung

GOLDMAN SACHS GLOBAL RESEARCH CENTRES

New York
Goldman Sachs & Co.
New York Plaza, 45th Floor
New York, New York 10004, USA
Tel: +1 212 902 1000

London
Goldman Sachs International
Peterborough Court
133 Fleet Street
London, EC4A 2BB, England
Tel: +44 (0)20 7774 1000

Paris
Goldman Sachs Inc et Cie
2, rue de Thann
75017 Paris, France
Tel: +33 (0)1 4212 1341

Hong Kong
Goldman Sachs (Asia) L.L.C.
Cheung Kong Center,
68th Floor
2 Queen's Road Central
Hong Kong
Tel: +852 2978 1000

Frankfurt
Goldman Sachs & Co. oHG
MesseTurm
D-60308 Frankfurt am Main,
Germany
Tel: +49 (0)69 7532 1000

Tokyo
Goldman Sachs (Japan) Ltd.
Roppongi Hills Mori Tower
47th Floor, 10-1, Roppongi 6-chome
Minato-ku, Tokyo 106-6147, Japan
Tel: +81 (0)3 6437 9960

Singapore
Goldman Sachs (Singapore) Pte.
1 Raffles Place, #07-01 South Lobby,
Singapore 039393
Tel: +66 889 1000

Washington
Goldman Sachs & Co.
101 Constitution Ave, NW
Suite 1000 East
Washington, DC 20001
Tel: +1 202 637 3700

Goldman Sachs Research personnel may be contacted by electronic mail through the Internet at firstname.lastname@gs.com