Did Dark Matter Prevent a Big Bang in the Recent Financial Crisis?

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In a 2005 paper, Ricardo Hausmann and Federico Sturzenegger responded to allegations that the United States, having a runaway propensity to enlarge its external debtor position in the global payments system, was doomed to collapse into a ruin caused by capital flight and a collapsing currency. Adapting the term "dark matter," they hypothesized that the U.S. actually had accumulated an invisible creditor position that more than offset its world's record debtor position shown on a global balance sheet – a position based on historical cost measures of foreign and American owned assets. Stretching an analogy from cosmology, Hausmann and Sturzenegger contended that this "dark matter" would prevent a "big bang" in the sense that the alleged currency collapse and capital flight crisis would never happen because the U.S. was actually not a debtor nation at all. Standard accounting procedures merely mismeasured her asset position. The global debt crisis of 2008-2009 provided an unusual opportunity for the so-called "big bang" to happen, but it apparently did not. The purpose of this paper is to examine whether the existence of dark matter indeed played a substantial role in preventing a "big bang," or, preventing, at least, a bigger bang than actually materialized.

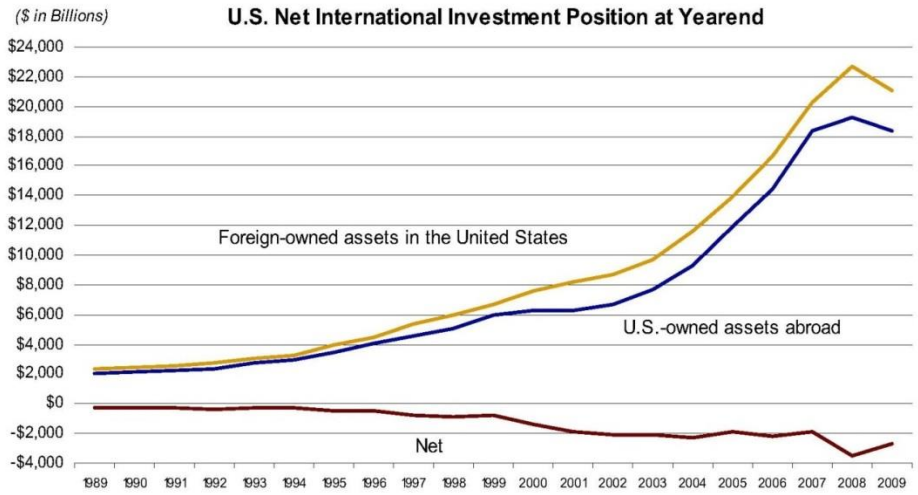
The Nature of Dark Matter

Hausmann and Sturzenegger (2005, p. 4) examine Bureau of Economic Analysis (BEA) figures for 2004 which showed the U.S. to have a net debtor position of $2.5 trillion – the difference between the dollar value of foreign owned assets in the U.S. and U.S. owned assets abroad. However, net income on the U.S financial portfolio in 2004 was a positive $30 billion. Supposing a 5% annual average rate of return on assets, the U.S. appears to be receiving income from a positive $600 billion in net foreign assets in 2004, implying that the U.S. is not a debtor nation at all, but a net creditor nation instead. It must have, since the 1980s when the U.S. had a net creditor position on the BEA balance sheet, exported more than it imported although the official cumulative current account deficits totaled several trillions since 1980. The U.S. must have

exported trillions of dollars worth of invisible exports that Hausmann and Sturzenegger call dark matter that the BEA bean counters fail to record. Indeed, at the time of this writing, the enigma persists with the BEA (2010) reporting a U.S. net debtor position of $2.7 trillion at the end of 2009 and net income for 2009 of $121 billion (see Charts 1 and 2 below).

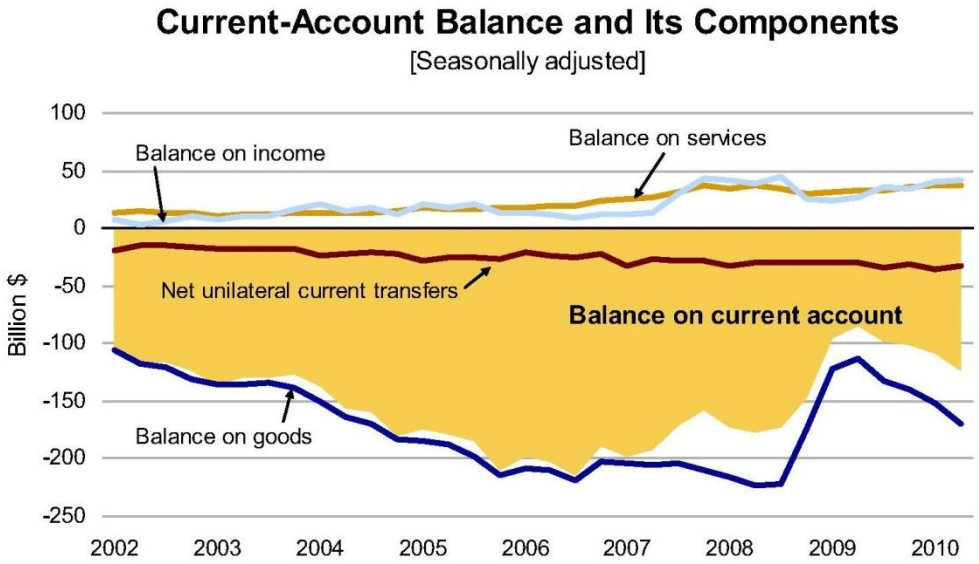
Dark matter originates from at least three invisible export categories, according to Hausmann and Sturzenegger (2005, p. 5). First, the U.S. provides "liquidity services" to people in the rest of the world who wish to hold dollars as a store of value. Second, like a bank, the U.S. borrows abroad at relatively low interest rates and then lends abroad at relatively higher interest rates, earning a sort of "insurance premium" from its overseas creditors purchasing safety as bank depositors purchase it from banks that transform risky asset portfolios into safer ones desired by depositors. Third, foreign direct investment (FDI) involves massive invisible, intangible assets acquired by U.S. corporations which build business enterprises overseas. To illustrate, the authors visualize a $100 million Disney theme park, "Euro-Disney," built in Europe from money borrowed in the Eurobond market at 5% interest. Disney Corporation nets $15 million in profit from the theme park although the balance of payments accounts recorded no net acquisition of an American owned asset, given the $100 million that seems to cancel out the value of the acquired tangible assets of the theme park. What is generating the $15 million? Dark matter, consisting of the blueprints, expertise, brand name, corporate culture, etc., added to the tangible assets to transform them into Euro-Disney. The U.S. Corporation is receiving a 5% return on an invisible $300 million worth of dark matter embodied in the collection of tangible assets bought in European markets with borrowed European money.

Chart 1: Net Debtor Position of the U.S.



Source: Bureau of Economic Analysis, VALUE OF FOREIGN INVESTMENTS IN THE U.S. DECLINES MORE THAN VALUE OF U.S. INVESTMENTS ABROAD IN 2009, *2009 Yearend U.S. Net International Investment Position,* June 25, 2010

Chart 2: Net Income is Positive for the U.S.



Bureau of Economic Analysis: U.S. CURRENT-ACCOUNT DEFICIT INCREASES IN SECOND QUARTER 2010 , *Preliminary estimates of U.S. international transactions,* September 16, 2010

The kind of dark matter that comes from FDI dominates as the source of positive net income for the U.S. in recent years (2005, p. 6). Indeed, Hausmann and Sturzenegger (2005, p. 10) calculate that the U.S. exported $559 billion worth of dark matter annually between 2000 and 2004. This means that the U.S. was not really running current account deficits, but current account surpluses instead, in recent years. Moreover, the existence of dark matter helps illuminate the mismatch between U.S. saving inferred from the National Income and Product Accounts and the appreciation of financial wealth in the U.S. The asset value of U.S. multinational corporations grew as they accumulated dark matter overseas, increasing the net worth of Americans who otherwise did not seem to be saving anything as they sustained levels of consumption sufficient to exhaust their incomes after taxes and transfers. Most importantly, rising net debtor status and current account deficits were not leading toward the big bang of a crashing dollar, amidst a crisis of U.S. capital flight, which experience from debt explosions in developing countries seemed to have portended ultimately for the U.S. Including dark matter on the balance sheet showed the U.S. to be a great creditor nation and not a debtor nation at all.

The Tax Arbitrage Challenge

Brad Setser (2006) argues that dark matter does not explain the existence of net income from abroad for the U.S. He essentially dismisses the first two sources of dark matter mentioned above. Setser then focuses on FDI as the major source of net income

earned by the United States. He reasons that foreign firms in the U.S. should be accumulating dark matter for their home countries just as much as American firms overseas seem to be accumulating it for America. Direct investment by foreign firms in the U.S. fell short of U.S. direct investment overseas by only $600 billion in 2004, says Setser (2006), a gap that is not nearly large enough to explain the substantial $128 billion net income received by the U.S. in 2004. Setser argues that it is the lower return on FDI realized by foreign companies investing in the U.S., compared with the higher return received by American companies with direct investment overseas that explains most of the net income received by the U.S. This, he suggests, comes not from dark matter differences, but from tax avoidance through transfer pricing. A company like Microsoft, for example, will send intermediate goods to Ireland and then a thin roster of Irish employees will turn them into finished goods valued by the company's accountants at much higher prices than the intermediate goods carried on the company's books. As a result, explains Setser, Microsoft's Potemkin village operation in Ireland earned gross profits of $9 billion in 2004. Shielding itself from billions in U.S. taxes, Microsoft paid only $300 million in taxes to the Irish government in 2004. Similarly, foreign firms operating in the U.S. can send parts and intermediate goods into America from overseas at high accounting prices and then show very little profit made in the U.S. plant where the profits are subject to relatively high U.S. taxes. In short, Setser argues that tax arbitrage through transfer pricing accounts for much of the net income that Hausmann and Sturzenegger think is attributable to dark matter.

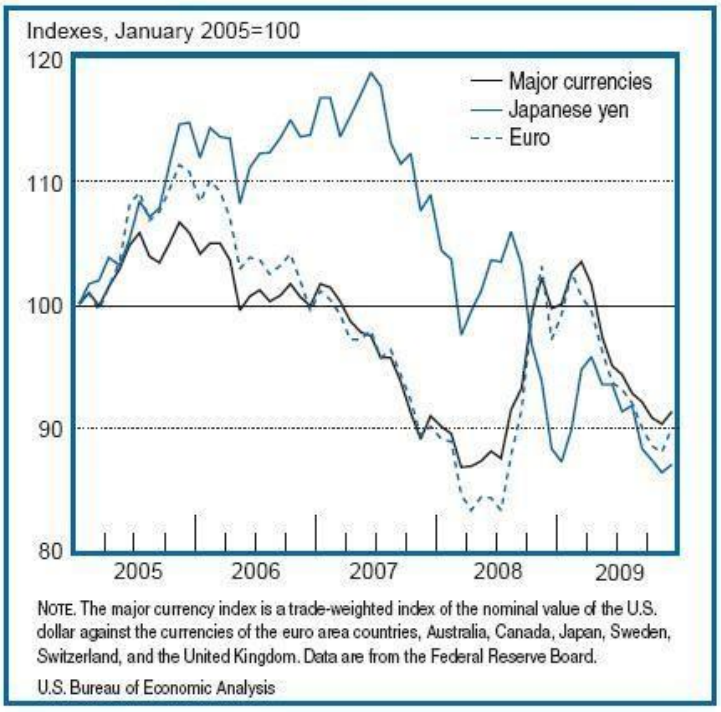
Daniel Gros (2006) also thinks that U.S. net income from abroad originates from tax incentives more than from dark matter. Gros concludes that transfer pricing fails to provide a compelling explanation for low earning from direct investment by foreign firms in the U.S. (p. 250) because, were it important, a persistent deterioration in the terms of trade for the U.S. should have revealed itself over the past few decades. However, Gros argues instead that foreign firms in the U.S. persistently underreport their retained earnings in the U.S. in order to avoid paying taxes on them. U.S. firms abroad do just the opposite, trying to avoid relatively higher U.S. taxes on profits. The result is that foreign firms in the U.S. seem to have substantially lower earnings than do U.S. firms operating abroad.

On the other hand, William R. Cline (whom Hausmann and Sturzenegger acknowledge as an earlier proponent of their dark matter concept) examines the question of tax arbitrage in Chapter 2 of his 2005 book. Cline cites two respectable studies that relate rigorously to the explanation summarized above from Setser. One study by Mataloni (2000) finds FDI returns for foreign firms operating in the U.S. to be only moderately different from FDI returns for U.S. firms operating overseas, and not different at all for firms with market share of 30% or greater. Mataloni finds analysis of imported inputs from affiliates fails to confirm profit shifting to abroad. Another study by Grubert (1997) "also finds that profit shifting does not explain much of the differential, and that firm age is an important determinant of return" (Cline, 2005, pp. 56-57).

Financial Crisis of 2008-2009

The dollar did not collapse during the global financial crisis of 2008-2009. In fact, measured against an index of major currencies, the dollar actually appreciated during the first part of the crisis and then depreciated back to its pre-crisis level by the end of 2009. Indeed, although the dollar depreciated in the order of 10% against the Yen, it appreciated against the Euro during the second half of 2008 and then ended 2009 about where it was in mid-2008 against the Euro, much as it did against an average of major currencies. This is clear in Chart 3, taken from the April 2010 issue of the *Survey of Current Business*. In fact, people seemed to rush to hold the dollar as a safe-haven currency during the worst part of the financial crisis. Prior enlargement of the current account deficit for the United States had foreshadowed the moderate depreciation of the dollar that seemed to have been in progress since 2005 and the crisis interrupted the dollar's descent rather than accelerating it. The U.S. was suffering banking and financial crisis that looked like it might rival the early 1930's crisis. Nevertheless, the dollar was like seizing your cleanest dirty shirt under circumstances in which you had no clean shirt to wear. The important point is that foreigners apparently did not flee the dollar when it looked like financial assets everywhere might shed their value precipitously.

Chart 3: Foreign Currency Price of the U.S. Dollar



NOTE. The major currency index is a trade-weighted index of the nominal value of the U.S. dollar against the currencies of the euro area countries, Australia, Canada, Japan, Sweden, Switzerland, and the United Kingdom. Data are from the Federal Reserve Board.

U.S. Bureau of Economic Analysis

While the U.S. net debtor position stood at $2.7 trillion at the end of 2009, the BEA (2010) reported that this was down considerably from its level of $3.5 trillion at the end of 2008. However, a great flight from dollar assets was hardly the cause of this change; the BEA (2010) provides a line-by-line analysis of the "U.S. Net Investment Position at Yearend 2009." The financial crisis caused enormous perturbations of the value of assets involved in these tallies. U.S. financial derivative assets decreased by $2.62 trillion, but U.S. financial derivative liabilities also decreased by $2.58 trillion, and both of these changes were mostly due to markets for interest rate and credit default swap contracts receding as financial markets froze. The difference might have looked somewhat like capital flight, but abhorrence for derivatives rather than for U.S. assets presumably caused it.

The total decrease in foreign-owned assets in the U.S. was $1.62 trillion, nearly a trillion less than the drop in foreign owned financial derivatives in the U.S. Foreign government official assets in the U.S. increased by $434 billion, while foreign private holdings of U.S. securities other than Treasury securities increased $666 billion, mostly due to the increase in prices of U.S. stocks held by foreigners. FDI in the U.S. increased by $151 billion, mostly the result of financial inflows rather than retained earnings that foreigners allegedly understate. The stock of U.S. currency held abroad even increased by nearly $13 billion in the wake of the great market crash that came near the end of 2008, according to the BEA (2010). Foreign residents did withdraw from U.S. banks ($212 billion) and U.S. non-banks ($66 billion), and sold off some U.S. Treasury securities ($25 billion). However, bank lending abroad had frozen much as in the U.S. and this is hardly an unambiguous sign of loss of confidence in U.S. assets because an overseas liquidity crisis drove it in the foreign private sector. Short-term capital was desperately needed in the private sector overseas, a topic we shall revisit below.

Likewise, U.S. owned assets abroad declined only $866 billion because increases in other categories offset the collapse of derivatives here. U.S. official reserves increased $110 billion due to rising gold prices and new allocations of Special Drawing Rights at the IMF. Reinvested earnings raised direct investment abroad by most of its $308 billion increase. U.S. holdings of foreign securities increased $1.49 trillion mostly due to rising stock prices abroad. U.S. banks reported a $388 billion increase in claims on foreigners. Appreciation of foreign currencies against the dollar likewise contributed to the increase in the value of U.S. assets abroad, especially holdings of foreign stocks. Rather than a crisis of confidence, the massive injection of reserves into the U.S. banking system may have pushed dollar balances abroad where they substituted for foreign bank reserve influxes that failed to match the magnitude of U.S. bank reserve expansion. This kind of dark matter may have been particularly important in the wake of the financial crisis that so intensified in the second half of 2008.

The Euro Zone suffered from constrained monetary policy at the end of 2008 and through 2009, compared with the U.S. where the monetary authority enjoyed a freer hand in undertaking a countercyclical monetary expansion of unprecedented proportions. Stelios Karagiannis, et al, (2010) show that, while the Federal Reserve pushed the Federal Funds rate essentially down to zero by the start of 2009, the comparable interbank lending rate for the EU only briefly dipped below 1% and then

rebounded above 1%. Other short-term rates in Europe remained similarly higher than in the U.S. during 2009, creating an apparent arbitrage opportunity in which financial institutions borrow in a country where rates are lower and invest in a country where rates are higher (a "carry-trade"). Karagiannis, et al, focus on a divergence between bank commercial lending rates and interbank loan rates that the crisis promoted with its rising risk premiums.

William Cline and John Williamson (2010) summarize the course of the dollar from the beginning of the crisis in 2008 until the end of 2009. They report that by June 2009, the dollar had already begun to depreciate from its substantial overvaluation that the safe-haven effect gave it in the aftermath of the sub-prime lending crash that began in 2008. China and four other East Asian economies kept manipulating the dollar with their own currencies and the dollar would otherwise have, by the end of 2009, fully adjusted to its fundamental equilibrium level had these five countries let it float freely. Several other countries including Australia, Brazil, Hungary, Indonesia, New Zealand, Poland, and South Africa typically have high interest rates and their currencies abruptly swung from undervalued to substantially overvalued due to near-zero short-term interest rates in the U.S. and the shift from dominance of safe-haven concerns to the dynamics of the carry-trade, according to Cline and Williamson. We can add that this carry-trade factor can account for a substantial amount of short-term capital outflow from the U.S. into these economies with higher interest rates.

Riva Froymovich, writing in the October 13, 2009 Eastern Edition of the *Wall Street Journal*, claimed that the end of the global financial crisis was marked by sovereign credits measured by J.P. Morgan's Emerging Market Bond Index Global expanding by more than 100% for Argentina, Ecuador, Pakistan, and Ukraine. Emerging market funds absorbed over $40 billion U.S. dollars as the carry-trade was driven by near zero interest rates in the U.S. while interest rates remained much more attractive in these developing countries. Several weeks earlier, Mark Gongloff wrote along similar lines in the *Wall Street Journal*, warning that a strong recovery in the U.S. could soon cause interest rates to rise in the U.S. and make big losers of people who bet against the dollar. Gongloff explained that the dollar's decline was caused by portfolio managers dumping dollars accumulated for safe haven motives and by an accelerating carry-trade driven by low U.S. interest rates. Betting against the dollar was tantamount to betting that zero short-term interest rates would persist indefinitely in the U.S. Owen F. Humpage and Caroline Herrell, writing in *Economic Trends* from the Federal Reserve Bank of Cleveland (2010) illustrate the effect of a rising interest rate differential and the Australian dollar to U.S. dollar spot exchange rate. The price of the U.S. dollar declines from a March 2009 peak near 1.6 Australian dollars to a November trough below 1.1 dollars as the interest rate differential between Australia and the U.S. rises from below 2.5% points to above 3.75% points.

A Big Bang Might Still be coming

If the Great Recession brought no big bang, might a big bang nevertheless be imminent ahead? Nouriel Roubini (2010) emphasizes the lack of serious deleveraging in

the wake of the Great Recession of 2008-2009. While debt to income ratios have stabilized at high levels in the household and corporate sectors, explains Roubini, they are expanding in the public sectors of advanced industrial economies at rates in the order of 10% of GDP annually. The coming issue is public sector indebtedness cascading toward default or inflation, in the absence of strong actions to curtail the debt expansion. Roubini fears, for the United States, for instance, political gridlock in which the Republicans control the House of Representatives and won't permit tax increases, while the Democrats control the Senate and won't allow spending cuts. The risk of serious market disruptions in the next several years is substantial because the bond market, with near zero interest rates, has not yet awakened to the dangers ahead.

Matthew McClearn (2010) explains that advanced nations like Greece are increasing sovereign debt at rates usually seen only in wartime. He emphasizes that the IMF predicts the average debt-to-GDP ratio of advanced economies in the G20 will top 118% by 2014, rising from their pre-crisis 2007 level of 78%. McClearn explains that rejection by global lenders makes massive inflation, credit contraction and tumbling asset prices likely for a country that expands sovereign debt too far. Credit-rating agencies have a poor record of anticipating the moment when nations will be perceived to have gone bust, says McClearn.

Hugo Dixon (2010) discusses how a nation can, for years, carry sovereign debt in excess of 100% of its GDP and then suddenly descend toward insolvency. In fact, governments can carry debts much larger than GDP if the "primary" budget balances (the budget balances, not counting interest payments), and the ratio of debt to GDP is prevented from rising by nominal GDP growth at a rate that exceeds the deficit the government is running (including interest payments) as a percentage of GDP. Dixon explained how Greece benefitted from this kind of equilibrium for years. The equilibrium is fragile, however, because: 1) growth can drop; 2) interest rates can go up; and/or, 3) the government can start running a primary deficit. The rise in interest rates can put downward pressure on GDP growth by forcing the government to tax more or spend less. As the situation deteriorates, lenders require further increases in interest rates to sustain their willingness to lend. Dixon explains that all three problems can come at once because government benefits rise if GDP falls in a recession, thus propelling a vicious cycle that turns into an economic death spiral for a profligate sovereign.

Kurt Badenhausen (2010) says the U.S. is not quite a banana republic yet, ranking 35th or one rung below Estonia on a list of 85 global sovereign debtors. Yet not all states are equal within the U.S.; California being more like a banana republic because it carries the worst bond rating (Baa1) of any state in the union. The other least solvent states were Illinois, New York, Connecticut, and New Jersey. At the other end of the spectrum, Nebraska, Utah, Texas, Virginia, and New Hampshire were the most solvent when a dozen factors including pension liabilities, debt as a fraction of GDP, and so forth, are considered. Because individuals and businesses can flee the least solvent states, the dynamics of government death spirals might seem even more volatile for a given state such as California.

Dark Matter is Largely a Private Sector Phenomenon

Hausmann and Sturzenegger identify private sector sources for dark matter, except for seignorage associated with foreigners' propensity to hold dollars. As sovereign debt of the U.S. government increases, there is no offsetting tendency for the foreign demand for dollars to increase – if anything, there would be a tendency for it to decrease, presumably. When the U.S. government goes further into debt, net income from abroad has no resulting tendency to increase on the U.S. balance of payments accounts. If a coming big bang will take the nature of a sovereign debt crisis for the government, then we would not expect dark matter to prevent this kind of big bang.

Agnes T. Crane and Lauren Silva Laughlin (2010) suggest that corporate debt instruments might actually be safer to invest in than government debt instruments. The situation in Greece seems to have demonstrated this possibility although investors have traditionally gravitated to government securities in the past when debt crises seemed impending. The debt of stable multinational companies has become a safe-haven substitute for Greek sovereign debt instruments. U.S. government bonds continue to be the ultimate refuge, but investors are becoming more worried about sovereign debt than bonds of highly rated companies such as Berkshire Hathaway and Kraft. Crane and Laughlin explain that Berkshire Hathaway and Kraft sold $17.5 billion in bonds on February 4, 2010, a day when global financial markets were diving due to concerns about Greece, Spain, and Portugal as potentially failing debtors.

The historical safe-haven of choice, when sovereign debt seemed untrustworthy, was gold. However, gold went down very dramatically at the onset of the Great Recession of 2008-09 and today has regained a level that makes it appear overbought unless on believes that the worst of the crisis is yet to come. Noureil Roubini, in a 2010 interview by Gillian Tett of the *Financial Times*, revealed that he had 100% of his 401k pension pot invested in a passive equity fund consisting of half U.S. and half non-U.S. stocks. Meanwhile, Roubini confessed that all of his extra saving from income in the past several years has been going into cash. With the threat of inflation looming, stocks may be the best inflation hedge in the long run. But money one will need to spend in the next several years has always best been kept out of the stock market.

Conclusion

The dark matter hypothesis was intended to explain why the apparently large global debtor position of the U.S. economy probably did not portend a coming collapse of the dollar. U.S. owners of foreign assets were earning substantially more income from those assets than foreign owners of U.S. assets were earning abroad. Collectively, Americans were not, therefore, obviously overextended with debts to foreigners. The Great Recession associated with the sub-prime financial crisis that erupted in 2008 serves as a sort of stress test vindicating this dark matter theory because the dollar held firm throughout the crisis and was used widely as a safe haven by global investors. The U.S. experienced no foreign exchange big bang, much as Hausmann and Sturzenegger predicted.

In the aftermath of that crisis, there remains suspicion that a sort of big bang is yet to come. However, this very real threat is not the result of the apparent net debtor position revealed by accumulating our past current account deficits from our balance of payments accounts. The threatening financial crisis now on the horizon seems to be coming from sovereign debt excesses. Dark matter probably cannot save us from that kind of big bang because there is very little government dark matter offsetting the government debt. The government may not be creating the kind of invisible value as seen in Euro-Disney, but enjoys only the dark matter associated with seignorage. Skeptics fear that the government is heading toward a crisis in which it may end up in a mad scramble to generate enough seignorage to service the public debt and that will be the kind of big bang we should really fear.

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