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**Statistical Issues Related to Global Economic Imbalances:  
Perspectives on “Dark Matter”**

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The views presented in this paper are those of the author and do not necessarily reflect those of the Bureau of Economic Analysis or the U.S. Department of Commerce.

## **Perspectives on “Dark Matter”**

There has been a large amount of recent interest in how the United States can be the so-called world’s largest debtor nation and at the same time have a persistent surplus on income in its balance of payments accounts.

This is not a new question. The U.S. net international investment position first turned negative either in the mid or late 1980’s (depending on which method is used to value direct investment positions in the United States and abroad) and has remained negative ever since. In contrast, the annual balance on investment income has persistently been in surplus (although it has been negative from the fourth quarter of 2005 through the second quarter of 2006, reflecting the most recent 3 quarters of data). Based on BEA’s published data, two factors explain the incongruence between negative net investment positions and positive income balances. First, there is a difference in the composition of U.S.-owned assets abroad compared to foreign-owned assets in the United States, with direct investment being more heavily weighted in the former than in the latter. Second, U.S. investors earn a much higher rate of return on their overseas assets, particularly on direct investment abroad, than what foreign investors earn on similar classes of assets invested in United States.

In contrast, the “dark matter” explanation for the incongruence is essentially that the U.S. net liability position is wrong, and that a primary reason that it is wrong is that the value of U.S. overseas assets are understated, mainly because large exports of intangibles by U.S. direct investors to their foreign affiliates (which increased the value of these foreign affiliates) have gone undetected. The argument continues that, although these exports cannot be directly measured, their existence and their value can be deduced by their impact on other flows (i.e., U.S. income receipts), similar to the way that astronomers have deduced the existence of “dark matter” in the cosmos by observing its impact on objects like planets and stars.

This paper briefly reviews the main points of the dark matter theory and discusses some of its implications.

## **Discussion**

Two researchers from the Kennedy School at Harvard University were the first to apply the term “dark matter” to the study of global imbalances.<sup>1</sup> They defined it in their working paper as the difference between their measure of a country’s net foreign assets (calculated by capitalizing the balance on net investment income based on an assumed 5% rate of return) and official estimates. As noted above, they contend that the U.S. has a positive rate of return on its international investment position despite it being the so-called world’s largest debtor nation, because the investment position is misstated. Also as noted earlier, they reasoned that the incorrect valuation of the investment position has implications for the U.S. trade balance. They contend that net U.S.-owned assets are understated by \$3.1 trillion at yearend 2004 because a vast quantity of U.S. exports of intellectual property that should be included in U.S. exports and in the U.S. investment position is missing from the official statistics. They argue that, if net exports were more accurately measured, the cumulative U.S. current account deficit since 1980 would largely vanish.

## **Some concerns**

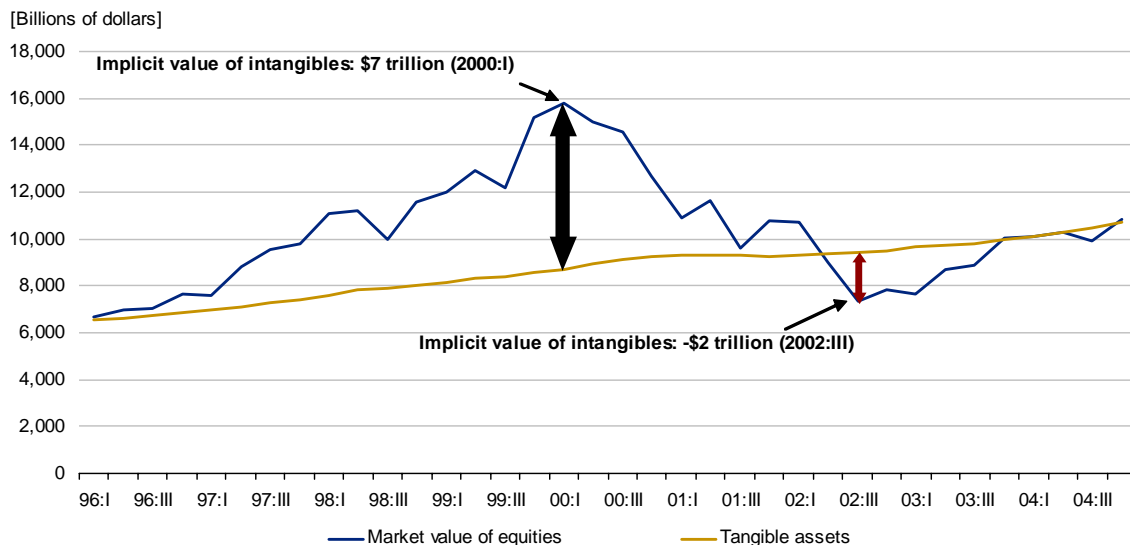
As noted above, the authors of the working paper value net foreign assets by capitalizing income flows rather than based on observable values. However, as the steward of the U.S. Balance of Payments and International Investment Position Accounts, BEA – like statistical agencies in other countries that follow the International Monetary Fund’s *Balance of Payments Manual* – values financial flows and positions based on market prices when they are available, not on theoretical values based on hypotheses of how markets might value an income stream. That is, stocks, bonds, deposits, currency, gold, etc. are regularly traded or are listed on public markets and their market values are known. Similarly, BEA’s -- and other countries’ -- estimates of exports and imports are based on

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<sup>1</sup> R. Hausmann and F. Sturzenegger, “Global Imbalances or Bad Accounting? The Missing Dark Matter in the Wealth of Nations,” Center for International Development at Harvard University, Working Paper No. 124, January 2006.

observable market transactions. The primary exception involves the market values of direct investment equity interests, which only rarely are directly observable. As a result, BEA revalues book values to current-period prices using two indicator series: stock market equity indexes and the replacement value of tangible assets. (Statements in the article suggesting that BEA measures direct investment positions only at book value are incorrect. Since 1991, BEA has published data on direct investment positions on 2 alternate bases of market values as well, and the market value estimates are featured in BEA's official estimates of the U.S. international investment position.)

It has been our experience that inferring the market value of intangible assets from related data sets can lead to large swings and distortions. For example, during the U.S. stock market run-up in the late 1990s, some analysts said that the large difference between the stock market value of U.S. corporations and the replacement value of their tangible assets was the implied value of the intellectual property and other intangible assets held by those corporations. However, when the implicit value of these intangibles fell from +\$7 trillion to -\$2 trillion in less than 3 years, this technique was shown to be flawed:



Source: FRB Flow of Funds (L.102 and B.102) release March 9, 2006. Data based on nonfarm nonfinancial corporate business.

A supposition in the working paper is that assets that pay a higher return are worth more than assets that pay less, but there are reasons why this supposition may not hold.

Over the last several decades the rate of return on U.S. direct investment abroad has averaged only about 1 percentage point more than the rate of return for all non-financial corporations in the United States. The somewhat higher return on U.S. direct investment abroad partly reflects the higher risks associated with overseas investments.

The rate of return on foreign direct investment in the U.S. is lower than the overall rate of return for all domestic non-financial corporations. There are a number of possible reasons why this may occur. For example, profitability is positively correlated with market share and BEA research indicates that in many industries, market shares for foreign-owned U.S. companies are relatively small. Also, much of the financing for foreign direct investment in the U.S. reflects foreign funds, and long-term interest rates in major foreign direct investor countries have, on average, been lower than those in the U.S. for an extended period. (Some key investor countries, particularly Japan, have had especially low long-term interest rates, which allow foreign investors to earn relatively low rates on their international investments and still achieve a positive net return.) In addition, the economies of scale associated with access to the large U.S. market through sales and distribution affiliates may result in increases in home country rates of return, and in overall returns, that more than compensate direct investors for the relatively low rates of return of their U.S. sales and distribution affiliates.

A frequently discussed question is whether transactions between foreign direct investors and their U.S. affiliates may occur at prices (“transfer prices”) that result in the U.S. affiliates recording artificially low profits. In striking contrast to those arguing that there are unmeasured U.S. exports, some analysts have recently argued that the undercounting of profits that accrue to foreign companies results in an understatement of the U.S. current account deficit of more than \$100 billion a year.<sup>2</sup> The question of whether transfer pricing distorts profits in the U.S. or abroad has been long studied and researchers have not yet reached a consensus. The U.S. is not an especially high tax

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<sup>2</sup> D. Gros, “Foreign Investment in the U.S. (II): Being Taken to the Cleaners?”, Centre for European Policy Studies Working Document No. 243, April 2006.

country when compared with many of its major trading partners. Average effective corporate tax rates in the U.S. are lower than those in Italy and Japan, and are higher than those in the Netherlands, Mexico, United Kingdom, and France. Effective rates in the U.S. are close to those in Canada and Germany.

### **Additional perspectives on dark matter**

As noted earlier, BEA follows international standards in valuing the international investment position. However, let's assume that U.S.-owned assets (primarily direct investment abroad) are substantially understated.

Under current international standards, in the case where U.S.-owned assets are revalued to a higher figure based on capitalizing direct investment earnings (all other factors held constant), there has not been a transaction between a U.S. and foreign resident and so U.S. exports should be unaffected. As demonstrated in the chart depicting the implicit value of intangible assets, there is no assurance that a U.S. resident will ever realize any value from the "exports" that are calculated in this fashion. Any change in the U.S. investment position calculated in this fashion should instead be treated as a valuation adjustment.

Consistent sets of accounting rules are followed in the national and international economic accounts, and so the valuation techniques in the working paper have implications for the measurement of GDP that were not discussed in the working paper but might be noted. First, net exports comprise a component of GDP, and so U.S. GDP should be revised upward if net exports are revised upward. Second, to maintain consistency, it seems to follow that entirely domestic positions and transactions should be remeasured using the valuation techniques in the working paper. For example, the U.S. banking sector collects deposits largely from households and lends those funds at higher rates of interest to businesses and persons, resulting in a net liability position vis-à-vis households. The banking sector also has a positive investment income balance vis-à-vis households (because the interest rate at which it lends is higher than that at which it borrows), mimicking circumstances in the U.S. international economic accounts. Using the techniques in the working paper, the net liability position of the banking sector would be revalued into a positive position (to yield the 5% targeted rate of return), and the

amount of the revision treated as the sale of dark matter to consumers of bank services (substantially increasing personal consumption expenditures and GDP). Obviously the use of these hypothetical values would quickly cascade into distortions in the estimates of corporate surplus, productivity, and virtually all other economic statistics if carried through the entire set of economic accounts.

## **Conclusions**

It is important to separate the compilation of statistical accounts (which should be based on objective internationally accepted rules) from techniques that might be used to analyze those accounts. Many of these analytical techniques are highly creative, but they also may lead to substantial distortions.

It has long been argued the U.S. receipts of income on direct investment abroad include a “premium” arising from superior U.S. management services or intellectual property rights. However, a simple reclassification of receipts from income on direct investment abroad to U.S. exports of services would result in offsetting changes within the current account. The balance on the current account would therefore be unaffected under this approach. In fact, that is the approach followed by BEA in its supplemental ownership-based framework of the U.S. current account (published each January in the *Survey of Current Business*; see <<http://www.bea.gov/bea/pub/0106cont.htm>>).

The dark matter working paper does not take into account any reasons for even partially resolving the paradox of an income surplus and a negative international investment position before concluding that it derives from mismeasured investment positions and unmeasured net exports. (Some other explanations were cited above.) In this way, the working paper differs from many other studies of economic growth, where known reasons for measurement differences are considered before attributing the residual difference to another factor. The working paper presents no compelling explanation why its estimate of the net international investment position (based on applying a 5% capitalization rate to income flows) should be accepted – it characterizes its estimate of net investment positions as “equally arbitrary” to BEA’s measure. However, as noted, BEA’s measure is not arbitrary because it is based on observable transactions and

internationally accepted measurement principles. Furthermore, if both sets of estimates are equally arbitrary, why then would anyone want to take the first difference between these estimates and use it as an estimate of unmeasured exports?

Despite the above misgivings, the working paper proposes a creative new way of explaining a positive balance on income and negative investment positions that has captured the fancy of the popular press and has generated increased enthusiasm for better measuring the benefits from R&D and other intellectual capital. BEA agrees that the measurement of intellectual capital poses substantial challenges, and BEA shares in the enthusiasm for better measuring R&D. BEA is engaged in long term research to improve the measurement of R&D. On September 28, 2006, BEA issued a preliminary study showing the contributions of R&D to economic growth. This study can be accessed on BEA's web site, at <http://www.bea.gov/bea/newsrelarchive/2006/rdreport06.pdf>. BEA plans to update and extend this study in fall 2007.