Incomplete Markets and the Current Account Deficit

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April 1996

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2 Incomplete Markets and the Current Account Deficit
Executive Summary

- The conventional wisdom of mainstream economists and policymakers argues that the trade deficit is principally the result of low savings in the United States. Although other factors play a role, they argue that the trade deficit problem can be solved by increasing savings in the United States. One way to do this would be to reduce or eliminate the federal deficit.

- We present another, more plausible explanation of the trade deficit. We show that, when otherwise identical countries trade, the country with more sophisticated financial markets will always run a trade deficit with the country having less sophisticated financial markets.

- The United States and Japan fit this pattern. In the United States, home mortgages are routinely traded on financial markets; in Japan, there is no secondary market for mortgages on existing homes. Japanese still save in “postal savings accounts,” but Americans have abandoned low-yielding savings accounts for mutual funds.

- The policy implications of this different explanation for the trade deficit are dramatic. No longer can one argue that “this is an American problem,” and that “America must put its house in order.” Americans need not be embarrassed at having the most sophisticated financial markets in the world.
4 Incomplete Markets and the Current Account Deficit
1. Introduction

The bilateral U.S. current account deficit with Japan has been a political issue since at least the early 1970s. 1 Until the early 1980s, however, the United States ran enough of a surplus with the rest of the world that the overall current account was in rough balance, and the complaints of the industries that were most notably unbalanced -- steel, consumer electronics and, subsequently, autos -- could be suppressed on the grounds that only the overall balance mattered. In the early 1980s, however, this defense evaporated as the United States began to run huge overall current account deficits. By a little incorrect arithmetic, analysts noted that a large percentage of the current account deficit was with Japan 2 and reasoned (correctly) that, if the deficit with Japan could be eliminated (and all the other deficits remained the same), so could most of the current account deficit. Although both have fluctuated and have shrunk as a percentage of GDP, both the current account deficit overall and the deficit with Japan remain significantly positive and are major political issues.

Practically every aspect of the debate has been controversial. We can break down the areas of controversy into two distinct, but by no means mutually exclusive, questions.

First, is the current account deficit a bad thing? In a system with floating exchange rates, markets clear. While the current account has been in deficit, the capital account has been in surplus, meaning that the balance of payments has been zero. In normal language what this means is that, while Americans have been buying more goods abroad than foreigners have been buying of American goods, foreigners have

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1For a discussion of this, see, for example, Kissinger(1981).
2The trade deficit is the sum of positive and negative numbers, so percentage is not a meaningful concept; however, the insight is correct that eliminating the auto deficit would eliminate much of the deficit.
been buying more U.S. assets (both directly, by buying or purchasing things in the United States, and indirectly, by buying financial assets) than the other way around. Many, particularly economists, wonder why Americans should be any more concerned about the "current account deficit" than foreigners should be concerned about the "asset deficit." This theory is caricatured in the example of Robert Solow and his barber: Robert Solow runs a "current account deficit" with his barber who sells him haircuts but doesn't buy his economics; the barber, on the other hand, takes Solow's assets while Solow doesn't take any of his assets.

On the other hand, many critics claim that the current account deficit is dangerous. Americans are buying goods from foreigners rather than from each other, which reduces employment, and borrowing money from foreigners to pay for it, which reduces future income. Many of these analysts go further to suggest that the current account deficit is the cause of, or closely related to, observed declines in real wages. Some of these people, trade union members and Republican presidential candidates, go so far as to say that unless the United States runs a surplus it should not trade at all, which leads logically to the preposterous suggestion that, if the United States exports $1 billion worth of goods and imports $1.0001 billion, foreign trade is bad and, if it reduces imports to $.999 billion, it is good.

The second question that fuels much of the debate is, What is the root cause of the current account deficit? Many discussions of this issue start with the following Keynesian accounting identity:

\[ C + I + G + X - M = Y \]

where \( C \) is consumption, \( I \) is investment, \( G \) is government spending, \( X \) is exports, \( M \) is imports and \( Y \) is government spending. This can be rewritten as

\[ Y - C - G - I = X - M \]

and when we note that

\[ Y - C - G = S \]
where $S$ is saving, we get the famous current-account-savings-investment identity:

$$S - I = X - M$$

This tells us something very simple, that the difference between what a country saves and invests must be equal to its trade surplus, and this is all it tells us. It does not say anything about levels: the difference between the variables is what matters -- high savings could result in a current account deficit, if it is combined with even higher investment. It also does not say anything about causality: if there is an exogenously specified current account deficit, then savings and investment must respond appropriately. Note that, if there is no international trade in assets, savings and investment cannot differ and trade will automatically be in balance.

Practically every theory about the current account deficit hinges on one or two of the numbers above. Many economists have focused on the left-hand side, i.e., declaring that the saving-investment deficit drives the trade imbalance. They have actually honed in even further to argue that low U.S. savings rates underlie the current account deficit. The evidence for this is that the U.S. savings rate is not just less than the investment rate but is also low by international standards. It is obviously true that a higher savings rate is not necessarily better. There is, though, a general feeling that the low savings rate reflects the caricature of the greedy, lazy, materialistic American. Martin Feldstein(1992) writes:

"...I have assumed that the savings rate is the predetermined variable that influences domestic investment and capital flows. I believe that this is generally true when the analysis focuses on long-run relationships. Sustained differences in savings rates among countries reflect differences in national attitudes about saving and borrowing, differences in fiscal incentives for private saving, and differences in public attitudes toward persistent budget deficits.

This argument, which seems to rest on convenience more than anything else, is not convincing. As I will show later, the ability to trade assets internationally can have a profound impact on the observed savings rate.

Others, particularly in Washington, have argued that the causality goes the other way, i.e., foreigners manipulate the current account deficit and the savings-investment deficit follows. In the past, these theorists argued that systematic biases in the U.S.
economy have hampered U.S. firms, but more recently they have focused their attention on barriers U.S. firms encounter in trying to penetrate foreign markets. 3

This debate is misguided. All of these variables are endogenously determined in equilibrium. Individuals choose what goods to buy, where to buy them and how much to save, all at the same time. To suggest that any one of these determines the others is simply wrong. I propose to analyze this question in a general equilibrium framework in which, as is usual, only endowments, utility functions, and the structure of the economy are exogenously specified. The conventional wisdom can be conveniently encapsulated in the idea that Americans tend to discount the future more -- note that we think of the national savings rate as including the budget deficit. This explanation is basically consistent with the observed facts. However, I will show that something else can also explain the observed phenomena: incomplete markets.

The approach in this paper is similar in many ways to that of Svensson(1988). However, the differences neatly illustrate the novelty of this approach. Svensson explores patterns of asset trade in a simple exchange economy by transferring much of the methodology of international trade theory over to this financial context. The goal of this analysis, he says (p. 376), is:

> to explain how [trade patterns] are caused by underlying differences between countries with respect to technology, endowments, preferences or other characteristics.

Note that he leaves financial market sophistication off this list; the principal determinants of the pattern of trade are thought to be characteristics of the two countries. In my model, the agents are exactly the same except for financial sophistication.

The purpose of this analysis is not to suggest that incomplete markets can explain the entire trade deficit. Many other things play a role: demographics, growth, investment opportunities, etc. However, this paper seeks to illustrate that incomplete markets can account for a portion of the trade deficit and that theories ignoring them could come to incorrect conclusions.

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3For a discussion of this, see Prestowitz et al. (1991) and Blecker(1992).
2. What are incomplete markets?

In the jargon of economics, an economy has complete markets if all risks are insurable. For example, in a complete market economy, one could buy a security that would pay off if one lost one's job. An economy has incomplete markets if some risks are not fully insurable and others are not insurable at all. Anecdotal evidence suggests that assuming complete markets is unrealistic. Many risks, such as unemployment, are not insurable. This is confirmed by empirical evidence. In Willen (1995a), I looked at whether various real risks faced by Americans could be hedged using financial assets. In most cases, financial assets only provided a small reduction in variability.

The introduction of a new security that allows one to hedge an otherwise unhedgable risk -- i.e., makes markets less incomplete -- is known as financial innovation. The introduction of crop insurance, which allowed farmers to reduce the risk of a bad harvest, is an example of financial innovation. Many examples of financial innovation are not nearly this obvious. Two examples illustrate this. First, in many countries, governments have placed restrictions on types of assets pension funds can hold. Reducing the diversity of portfolios has increased risk and reduced returns. Elimination of these restrictions, allowing investors to buy risky assets that were negatively correlated with one another, increased investment opportunities. Second, in Willen (1995b), I showed that government loan guarantees to home purchasers could function as a form of financial innovation. Allowing borrowers to default under certain circumstances dramatically improved borrowing opportunities.

3. Why is this relevant to the trade deficit?

Since savings and investment play a crucial role in the determination of the trade deficit, anything that affects them is important. So, the question is, How do incomplete markets affect the trade deficit? In Willen (1996), I show that incomplete markets can have a profound effect on trade.

First, in a two-period model with uncertainty, I show that, if one country has more sophisticated financial markets than the other, it will always run a trade deficit.
Incomplete Markets and the Current Account Deficit

(i.e., consume more than it produces) in the first period. In the second period, it will run a trade surplus, but the trade surplus will be smaller than was the trade deficit in the period before.

For example, imagine a simple world in which there are two countries that face identical income risks. Both countries are composed of two individuals who are identical except that they face symmetric income risks. In other words, the sum of income during the second period in one country is always the same; only the way it is divided changes. Although the following could be true for any example fitting the above criteria (any reasonable utility function, etc.), we look here at an example with negative exponential utility in which the agents in the two countries have the same discount rate. However, for agents in country 1, we allow complete trading in all possible securities, allowing perfect insurance. Clearly, risk-averse agents who face symmetric risks will share them and will each get the same fixed income in the future. In country 2, agents can only trade the riskless asset. This means that no risk-sharing is possible. If they were only trading between themselves, they would simply not trade at all, since they all have the same discount rate.

Example 3.1  Two countries, one with complete and one with incomplete markets.

<table>
<thead>
<tr>
<th>Period</th>
<th>Deficit of country 1</th>
<th>Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0124</td>
<td>-4.4%</td>
</tr>
<tr>
<td>2</td>
<td>-0.0118</td>
<td></td>
</tr>
</tbody>
</table>

We see, first, that the country with complete markets runs a deficit in the first period and a surplus in the second, just as our analytical result told us. In addition, we see that the interest rate in the first period is actually negative. This is especially intriguing in light of the fact that we have positive discounting by both countries here.

The intuition behind this is simple. In one country, the only available investment instrument is the so-called "riskless asset," a bond which pays off the same amount, no

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4 The following summarizes Willen (1996)
5 This type of economy is known as an economy with incomplete markets and restricted participation. For details see, Balasko, Cass and Siconolfi (1991).
matter what happens in the future. This is severely restrictive to both borrowers and savers, if their income is uncertain in the future. First, for borrowers, the requirement that they pay off the full amount of the contract, no matter what happens, means that they can only borrow as much as their poorest condition in the future. In other words, if a person has an income which could be as high as $100,000 but could be as low as $20,000, then her borrowing opportunities will be almost the same as someone with a constant $20,000 in the future. Second, for savers with uncertain income, risky assets can hedge their income by paying off more when other risks they face do poorly. For example, an employee of an automaker might buy shares in his competitors. If the only asset available is the riskless asset, however, the saver must engage in what we call precautionary savings.

As a result, a country with incomplete markets will have a large demand for saving opportunities, but, if these restrictions affect everyone, it will not have a supply of saving opportunities (i.e. borrowers). However, when comparing two closed economies -- one with incomplete markets and the other with complete markets, all else equal -- we would expect to find a much lower interest rate in the country with incomplete markets, even though the overall savings rates may be the same, because demand by borrowers is low. So, taking this line of argument one step further, we imagine opening the two economies to trade, thus (roughly) equalizing the interest rate somewhere in between. The complete-markets country will be the borrowers, paying a much lower interest rate than otherwise, and the incomplete-markets country will be savers, receiving a much higher interest rate.

So, we have one theory to explain the current account deficit. However, one might counter that another, much simpler explanation could deliver the same results -- namely, that Americans are myopic, and saving for the future is just not part of our culture. We can easily see this by looking at the same model but now assuming that both countries have complete markets, and one of them simply discounts the future more, as the following example shows.
Example 3.2 Two countries, both having complete markets but with differing discount rates.

<table>
<thead>
<tr>
<th>Period</th>
<th>Deficit of country 1</th>
<th>Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0031</td>
<td>2.6%</td>
</tr>
<tr>
<td>2</td>
<td>-0.0032</td>
<td></td>
</tr>
</tbody>
</table>

We have a similar story here. Country one borrows in the first period (running a deficit) and pays it back in the second period. Here we note that this interest rate is positive, so there is some difference.

These two competing explanations, at first blush, do not seem to be all that different, but we can extend this model to a dynamic framework and see that, in fact, over time, the differences are profound. Suppose we look at a ten-period version of the different-discount-rate model. If we look at our original example, in which the discount rates are different, we see that the equilibrium is not all that different.

Example 3.3. Two countries, both having complete markets but with different discount rates.

<table>
<thead>
<tr>
<th>Period</th>
<th>Deficit of country 1</th>
<th>Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0274</td>
<td>2.6%</td>
</tr>
<tr>
<td>2</td>
<td>0.0210</td>
<td>2.6%</td>
</tr>
<tr>
<td>3</td>
<td>0.0146</td>
<td>2.6%</td>
</tr>
<tr>
<td>4</td>
<td>0.0082</td>
<td>2.6%</td>
</tr>
<tr>
<td>5</td>
<td>0.0018</td>
<td>2.6%</td>
</tr>
<tr>
<td>6</td>
<td>-0.0045</td>
<td>2.6%</td>
</tr>
<tr>
<td>7</td>
<td>-0.0109</td>
<td>2.6%</td>
</tr>
<tr>
<td>8</td>
<td>-0.0173</td>
<td>2.6%</td>
</tr>
<tr>
<td>9</td>
<td>-0.0240</td>
<td>2.6%</td>
</tr>
<tr>
<td>10</td>
<td>-0.0302</td>
<td></td>
</tr>
</tbody>
</table>

We observe that country one borrows in the first half and lends in the second half, exactly as in the two-period model. Now we look at the model with incomplete markets in a dynamic setting.
Example 3.4. Two countries, one with complete, and one with incomplete, markets.

<table>
<thead>
<tr>
<th>Period</th>
<th>Deficit of country 1</th>
<th>Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.131</td>
<td>3.0%</td>
</tr>
<tr>
<td>2</td>
<td>0.125</td>
<td>2.6%</td>
</tr>
<tr>
<td>3</td>
<td>0.119</td>
<td>2.2%</td>
</tr>
<tr>
<td>4</td>
<td>0.111</td>
<td>1.6%</td>
</tr>
<tr>
<td>5</td>
<td>0.102</td>
<td>0.6%</td>
</tr>
<tr>
<td>6</td>
<td>0.091</td>
<td>-0.8%</td>
</tr>
<tr>
<td>7</td>
<td>0.076</td>
<td>-3.6%</td>
</tr>
<tr>
<td>8</td>
<td>0.054</td>
<td>-9.7%</td>
</tr>
<tr>
<td>9</td>
<td>0.015</td>
<td>-65%</td>
</tr>
<tr>
<td>10</td>
<td>-0.260</td>
<td></td>
</tr>
</tbody>
</table>

The difference in this case is dramatic. Here country one runs a trade deficit every period except the last. Note that, although the interest rate is positive during some of the periods, it is always less than the rate of time preference. The country with complete markets, thus, chooses a downward sloping consumption path.

4. Do the United States and Japan fit this pattern?

The stylized facts about financial opportunities in Japan and America are surprisingly consistent with the theory that America has significantly more-complete markets than Japan. In the examples given above, we considered cases where investors in one country had access to only one asset, one which paid off the same amount in every situation in the future -- which we call the riskless asset. As I mentioned before, this affects both borrowing and saving. So, we will consider them in turn:

4.1. Borrowing in Japan and the United States

Although individuals borrow for all kinds of reasons, the principal financial transaction in most people's lives is the purchase of a home, which practically everyone finances through debt. The United States has the most sophisticated mortgage-finance
system in the world and, among industrial countries, Japan has one of the least. Specifically, U.S. and Japanese markets differ in the following ways:

1. Loan guarantees: In Willen (1995b), I showed that loan guarantees can be seen as a form of financial innovation. In particular, by allowing borrowers to default under certain circumstances, they can dramatically increase the ability of people with risky income to borrow, which can, in certain situations, benefit everyone (savers benefit from the increased demand for their funds). Importantly, I also showed that a simple reduction in the interest rate does not have the same effect. Simplistically, if one cannot pay back the principal, reducing the interest rate will not allow one to borrow. Loan guarantees are a form of financial innovation, in contrast to interest reduction, which is simply an expensive and ineffectual subsidy.

In fact, the principal form of government intervention in U.S. mortgage markets has been loan guarantees. Starting during the depression and the Second World War, U.S. government agencies such as the Federal Housing Authority, the Veterans Administration, the Farmers Home Administration and the Government National Mortgage Association have given explicit federal guarantees to mortgage lenders. By contrast, Japanese policy has been to lend money from the postal savings system to home buyers through the Japan Housing Loan Corporation, at below market rates, and then to use a government grant to make the lenders whole. In addition to the aforementioned problems, this explicit subsidy has made it difficult to expand these programs.

2. Secondary markets: The expansion of secondary markets for mortgages has been one of the most dramatic changes in U.S. financial markets in the last twenty years. First, standardized mortgages made mortgages tradable. Second, government-sponsored organizations such as Fannie Mae and, subsequently, independent financial firms, have taken groups of mortgages and turned them into all sorts of complex securities, allowing lenders to hedge precisely many of the risks in these mortgages, mostly related to prepayment.

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6 The following discussion owes much to Seko (1994).
7 Details of this discussion come from Fabozzi and Modigliani (1993).

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The almost complete absence of such markets is a curious feature of the Japanese financial system. In the United States, financial institutions routinely sell mortgages soon after they originate them. This allows them to ignore the effect that the risks related to payment stream would have on their own portfolios. In Japan, no such secondary market exists for mortgages on existing homes.

3. Down payments: Another bizarre feature of Japanese mortgage markets is the very high level of self-financing. In 1989, the average Japanese home buyer financed only 55.8 percent of his home purchase. In general, financing of more than 70 percent of a home is not uncommon. By contrast, a down payment of as little as 10 percent on a home is common in the United States.

4.2 Saving in the United States and Japan

The Japanese financial system has also reduced saving opportunities dramatically. An unsophisticated view of risk on the part of regulators, and the cozy relations between bureaucrats and the institutions they regulate, have hampered Japanese pension funds. Funds have labored under the 5-3-3-2 rule, which requires that fund managers place 50% of their funds in bonds and cash, and limits holding of foreign securities to 30%, domestic equities to 30%, and property to 20%. In addition, pension fund investments have been used to cement relationships between banks and their clients rather than to get the best return for the pension holders. The so-called "Chinese walls" that separate fund management and investment banking activities do not exist in Japan.  

The result is that, whereas Americans have been pouring money into mutual funds and other higher-yielding investments, Japan’s Postal Savings System remains the world's largest bank.

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8See The Economist, Feb 10, 1996, pp. 73-4.
5. Some empirical evidence

This model makes the prediction that the savings rate is not an exogenous variable. The methodology of time-series econometrics gives us a rough test for econometric exogeneity. Granger (1969) and Sims (1972) developed a notion of causality that says one variable “fails to Granger-cause” another variable if it cannot help in forecasting that variable. Although there are many ways of testing this, Geweke, Meese and Dent (1983) show that it is most effective simply to regress a variable against lags of itself and the proposed causing variables, and to test the restriction that the coefficients on the particular variable in question are zero. In other words, say we have three variables \( x, y, z \). We estimate the following regression:

\[
x_t = \beta_0 + \beta_1 x_{t-1} + \beta_2 y_{t-1} + \beta_3 z_{t-1} + \epsilon_t
\]

We then simply test the hypothesis

\[
H_0: \beta_2 = 0
\]

using an F-test.

In this case, we will test whether the following variables "Granger-cause" the gross savings rate (GSAV): Imports (GIM), terms of trade (TOT) (defined as the export deflator divided by the import deflator), and gross domestic product (GDP). If we fail to reject the null that all the coefficients are zero, we can then say that the savings rate is an exogenous variable. The results of the regression follow:

**Table 5.1 Results of Granger-causality tests**

<table>
<thead>
<tr>
<th>Variable</th>
<th>F-stat</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imports</td>
<td>51.0638</td>
<td>0.00</td>
</tr>
<tr>
<td>Terms of trade</td>
<td>3.3398</td>
<td>0.01</td>
</tr>
<tr>
<td>GDP</td>
<td>2.8907</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Indeed, we reject the null in every case at the 5% significance level. In other words, past values of these variables can be used in forecasting the savings rate, showing that the hypothesis of strict exogeneity of the savings rate can be rejected.

Other evidence confirms this. The hypothesis of exogeneity of the savings rate leads, with other assumptions, to the "twin deficits" argument. Since the budget deficit is a reduction in national savings, an increase in the budget deficit should lead to an increase in the current account deficit. The rise of both the budget deficit and the current account deficit in the United States during the 1980s was widely cited as evidence of this. Obstfeld and Rogoff (1995) tested this hypothesis that high budget deficits and high current account deficits are correlated. They found that this was true in some time periods but, in recent years, there has been no correlation at all. This fits with anecdotal evidence: Italy has run enormous budget deficits but has not run current account deficits in recent years.

5. Conclusions

In this paper, we see that institutional differences between the United States and Japan, and the resulting market incompleteness problem, can explain the persistent trade imbalances between the United States and Japan. Although differing discount rates can also explain trade imbalances, they do not seem as well suited to explain the persistence of trade imbalances we observe. This has profound implications for the debate over the trade deficit:

1. The low U.S. savings rate results not from spendthrift, wasteful American consumption, but from the sophistication of our financial markets. This is something for which we need not apologize, and we can reject out of hand the claim that America alone is responsible for its trade problems.

2. Both theoretical and empirical analysis suggest that the "twin deficits" phenomenon is nothing more than a statistical curiosity. Unless it dramatically affected savings and investment behavior in the United States, deficit reduction, while useful in its own right perhaps, would not affect the trade deficit. Continued focus on the U.S. budget deficit is especially ironic in light of the fact that Japan is currently running record budget deficits (much larger, as a percentage of GDP, than the U.S. budget deficit), while also running the world’s largest trade deficit.

3. While clearly hurting Japanese consumers, financial repression has allowed Japanese firms and banks to become major international investors and lenders. This has given them a power and authority in world markets out of keeping with their
size and sophistication. Powerful and well connected Japanese firms may be loath to give this up.
References


Willen, Paul, 1995a. “Some results on social risk sharing and financial markets.” Yale University mimeo.
