

Christiano  
C06, Fall 1999

## Lecture #1: Rough Notes on National Income Accounting and the Balance of Payments

You should be somewhat familiar with national income accounting in the closed economy context, from C11. We will build on that to develop the basic accounting identities relevant to the open economy.

### 1. The National Income Identity.

Gross National Product is the value of goods and services produced by the factors of production of a particular country (i.e., workers and owners of productive factors like factories, taxi-cabs, etc.) Since GNP measures things sold in a market, there is a buyer and seller for each transactions. That is, GNP can be measured from the expenditure view or the income view. The two are the same.

Consider first the expenditure view, which divides up GNP according to who bought it, domestic households (consumption), government consumption, investment and foreigners:

- $C^d$  - household consumption of domestically produced goods and services
- $I^d$  - investment purchases by firms of domestically produced goods and services
- $G^d$  - government purchases of domestically produced goods and services
- $EX$  - foreign purchases of domestically produced goods and services.

Then, GNP is just the sum of these:

$$Y = GNP = C^d + I^d + G^d + EX$$

This is called the **national income identity**.

The **income approach** to the GNP identity focuses on who earns the income generated in the process of producing GNP.

There is a third perspective, the **value-added view**. It breaks up GNP according to which kind of firm produced the goods and services that make up GNP: manufacturing, mining, utilities, etc.

In 1991 the US. switched from emphasizing Gross National Product (GNP) as the basic measure of total output, to GDP. GNP measures output as the amount produced by domestic factors of production, regardless of their geographic location. The production of US residents while living abroad (as measured by their earnings) is counted as US GNP. Earnings generated by firms that are on foreign soil, but owned by US residents, is counted as US GNP. Similarly, the production of a foreigner in the US is not counted as part of US GNP. GDP is different from GNP in that it measures output produced on US soil. Thus, the income of an American who earns rent on an apartment building in Tokyo is counted in US. GNP, but in Japanese GDP. In practice the two concepts of output do not differ very much in the US. The US switched to GDP simply to be compatible with most countries in the

rest of the world, which use GDP. Presumably, there are other countries where the difference between GDP and GNP is large. This is obviously true for regions within countries. For example, many of the workers in the business district in Chicago commute in from outlying areas. So, the GDP of Chicago's business district must be much larger than its GNP. The Krugman and Obstfeld book uses the concept of GNP, and so that is the concept of output that we will use in the course.

The way I wrote the national income identity above is not the usual way it is written. We arrive at the more conventional way of writing this in two steps. First, write:

$$Y = (C - C^f) + (I - I^f) + (G - G^f) + EX = C + I + G + EX - IM,$$

where

1.  $C$  - total household consumption of produced goods and services =  $C^d + C^f$
2.  $I$  - investment purchases by firms of goods and services =  $I^d + I^f$
3.  $G$  - government purchases of goods and services =  $G^d + G^f$ .
4.  $IM$  - imports of goods and services produced abroad =  $C^f + I^f + G^f$ .

Second, the standard way of writing the national income identity is as follows:

$$Y = C + I + G + CA,$$

where  $CA = EX - IM$ . This says that total output equals total consumption expenditures plus total investment expenditures plus government expenditures, plus the current account.

## 2. The Current Account

The national income identity can be rewritten:

$$CA = Y - (C + I + G).$$

This says that households, firms and government can together buy more than is actually produced in the country. How can this be? How can  $CA$  ever be different from zero? For example, when  $CA < 0$ , then foreigners make up the difference between what domestic residents produce and what they consume. Why would they do this?

To answer this, it is necessary to look at how international transactions are made. When I buy a foreign car, I send dollars abroad to pay for it. Say I send \$1000. Now, suppose  $CA = 0$ . In this case, there are just as many foreigners who want to buy American goods. Suppose those foreigners want to buy \$1000 of US cars. Then, everything is balanced and there is no particular puzzle.

Now imagine a slightly different scenario. Suppose foreigners do not want American cars. It's just me that wants to buy a foreign car. From my point of view, things work in the same way that they did before. I send \$1000 abroad and I get the car. But, what happens to those \$1000? One possibility is that the \$1,000 just stays abroad. An unlikely way this could happen is if the car seller just sat on those dollars. This possibility is unlikely because dollars do not earn interest, while other assets do. If you're going to sit on paper assets,

might as well sit on one that generates income than on one that does not. Another possibility is that the car seller turns around and buys something else locally for those dollars (say, raw materials to produce cars), and that the person who takes those dollars passes them on to another local person, and so on. That is, it is possible that those extra dollars stay abroad and circulate as foreign currency. The rest of the world has been steadily accumulating US dollars in this way. One reason for this is that often the US dollar is a superior substitute for local currencies, whose value can be unreliable. So, one possibility is that the \$1,000 just stays abroad.

Another possibility is that the foreign recipient of the \$1,000 buys a US asset which generates income, or that the foreign recipient deposits the money in a local bank which does the same thing. The US asset is any claim to current and future payments. It could be a stock, a bond, ownership of land or buildings, etc. Foreigners have been steadily accumulating US assets for the past 20 years, when the current account has been persistently negative.

## 2.1. An Example

To clarify these concepts further, let's take an example, from US data for 1992. Then, in billions of dollars:

$$Y = 5950.7, C = 4095.9, I = 770.4, G = 1114.9, EX = 636.3, IM = 666.7.$$

In this case,

$$C + I + G = 5981.2$$

which exceeds  $Y$  by \$30.5 billion. Since expenditures on goods and services exceeded output of goods and services by 30.5, the difference must have come from abroad. In fact, imports exceeded exports by 30.4 (.1 billion, or 100 million dollars, got messed up in the rounding that was done!) That is, the current account was  $-30.4$ .

We can rewrite the National Income Accounting identity to emphasize the link between the flow of goods and services (i.e.,  $C, I, G, EX$ , and  $IM$ ) and financial variables:

$$S = (Y - T) - C + (T - G) = Y - C - G,$$

where  $S$  is defined as national saving. Then, the national income identity can be rewritten so that

$$S - I = CA.$$

The variable,  $S$ , is the flow of domestically generated saving - it is the sum of private saving,  $S^{private} = Y - T - C$ , and government saving,  $S^{public} = T - G$ . It arrives in financial markets in the form of savings deposits, purchases of government debt, purchases of stock and debt, etc. In 1992, the supply of saving was 739.9. It's interesting to break this down into its private plus public components. Since  $T$  was 837.95 in that year, disposable household income  $Y - T = 5112.8$ . Thus,

$$S^{private} = Y - T - C = 1016.9, S^{public} = T - G = -276.95.$$

So, total national saving, the sum of these two, was

$$S = 1016.9 - 276.95 = 739.9.$$

At the same time, the demand for saving for purposes of US investment came to more than that, 770.4. The difference is  $S - I$ , and was supplied by foreigners. It is called **net foreign investment**, and amounted to  $-30.5$ . This is just another word for the current account. In a way it is an unfortunate choice of words, since it is inconsistent with terminology in the national income accounts, where investment refers to  $I$ , not  $S - I$ . When net foreign investment is positive, there is a flow of saving going abroad. In another unfortunate choice of terminology, this is referred to as a **capital outflow**. This is inconsistent with other usage in macroeconomics, where capital is used to refer to physical productive things, like factories, cars, etc. When net foreign investment is negative, then we say there is a **capital inflow**. So, the US experienced a capital inflow in 1992 of 30.5 billion dollars. Where did those 30.5 billion come from?

According to the national income accounts, the excess of imports over exports was 30.5 billion in 1992. That's where the extra money came from. Americans bought 666.7 from foreigners and they bought 636.3 from us. In this way, foreigners accumulated  $666.7 - 636.3 = 30.4$  billion US. dollars. Some of those dollars just stayed abroad. But, most were converted into income-earning assets, like US. government debt, or stock or bonds. In this way, foreigners financed the excess of US purchases over sales by accumulating US assets.

## 2.2. Is a Negative Current Account a Bad Thing?

Is it necessarily bad when  $S < I$ ? Without further information, it is impossible to say. The following discussion illustrates the various possibilities. First, I'll address the issues in general terms and offer some toy examples for illustration. Then I'll present three real-life examples. The first two of these illustrate the possibility that a current account deficit is bad and the third shows why it might be good.

### 2.2.1. General Discussion, with Toy Examples

Suppose a family buys a house. The price of the houses people buy usually exceeds their annual income. So, in the year that the typical family buys a house it experiences a (typically, huge) 'capital inflow'. A bank or mortgage company gives the family the money to buy the house with (this is the capital inflow), in exchange for a legal contract that requires the household to pay off the debt over time (the mortgage document, an asset to the bank). Is the fact that this household went negative on its current account a bad thing? If the household finds that the expense of maintaining the house and of paying interest on the mortgage exceeds the enjoyment it gets out of the house, then it *is* a bad thing. But, we have to presume that, on average, households are rational in the sense that they properly weigh the costs and benefits of home ownership, so that the decision is a good one.

There are plenty of other examples. Consider a family with 3 children of similar ages. The annual college costs while those kids are in school will be around \$90,000-100,000. Most families make a lot less than that (the medium family income in the US is \$34,000). So, a typical family in a situation like this will be running a huge current account deficit. This

will cause their net asset position to drop. This means, if they saved up in the past, that they'll draw down on their saving. Or, if they didn't save up, then they'll borrow. Either way, their net asset position will drop a substantial amount. Is this a good thing? Most people would say, *yes*.

Here is yet another possibility. Suppose a family is not paying attention to their income, and they go on a spending binge, just for the heck of it. In the process, they run a 'current account' deficit, and accumulate a lot of debt. If later, when they confront the expenses of paying of the debt, they conclude that they made a big mistake, then this may be a current account deficit that was 'wrong' or 'bad'.

One way to think about a current account deficit is like this. The possibility of a deficit allows you to consume more today, at the cost of being able to consume less in the future, when you have to pay off the principle and interest on the debt you accumulated. If this is done rationally, fully weighing all the consequences, then it is hard to see why a current account deficit is bad. If, on the other hand, not all the consequences are properly taken into account, then it may well be a bad thing.

Here is another example, more relevant to the topic of this course. A part of real-world investment,  $I$ , is actually carried out by foreigners, and is called **foreign direct investment**. This is investment (say, the building of a factory), where the foreigner financing it is the one who builds it and then operates it. Typically, this is done by multinational firms, when they expand their production operations into another country. Suppose a current account deficit reflects investment of this type. Is this good or bad? In fact, reasonable people can and do disagree in particular cases (for example, the investment may create pollution). However, it seems safe to presume that, in general, it *is* a good thing. The factory or other productive asset created through investment of this type creates new jobs and brings new technical knowledge into the recipient country. And notice that the stream of payments sent back to the foreign investor in the future is paid for directly by the profits generated by the investment itself. These are not payments that, like taxes or mortgage payments, are an unpleasant burden for citizens to shoulder.

Here is a general way to think about whether a negative current account is good or bad. If it is the result of private decisions which fully take into account all the implications, then it seems fair to presume that the deficit is actually a good thing. A voluntary exchange between two parties, where (i) the consequences of the exchange are limited to just the two parties involved and where (ii) both parties accurately understand the consequences of what they do, is likely to make them both better off without affecting anyone else. It is hard to say that exchanges like this are anything other than a good thing. A current account deficit that reflects exchanges like this surely has to be good.

### 2.2.2. The US in the 1980s

So, when might a negative current account be a *bad* thing? One case is when it reflects decisions about  $I$  or  $S$  that do not take into account all the consequences. Generally, it is thought that  $S^{private}$  is determined rationally, with reasonable thought being given to the consequences. Individual agents have every incentive to think hard about the long-term consequences of borrowing today, because they are the ones that will have to face those consequences. But, sometimes the consequences of  $S^{public}$  may not be thought through

properly. Politicians have relatively short terms in office, and may not have enough incentive to think about the longer-term implications of their decisions. If a current account deficit reflects a fall  $S^{public}$ , and to the extent that this reflects decisions that do not take into account the impact on future generations, then such a deficit would be a bad thing. In the textbook, Krugman and Obstfeld seem to argue that the US current account deficit of the 1980s is an example of this. They argue that the deficits fundamentally reflect a conscious decision to drop in  $S^{public}$  in the early 1980s. Since  $S^{private}$  did not rise to make up the fall and, overall,  $I$  did not change, the fall in  $S^{public}$  was made up by a fall in the US current account. The consequent increase in assets held by foreigners (mainly, US government debt) will have to be paid off over time. Future US citizens will have the unpleasant burden of having to dig a little deeper into their pockets to come up with the necessary tax payments.

Will they be happy about this? If they thought that the drop in  $S^{public}$  that was responsible had somehow led to other things that improved their circumstances, then they would have little cause to complain. For example, if the drop was a necessary side effect of policies that had led to an explosion of investment that made future generations better off, then they should be happy to pay off this debt. But, the evidence presented in Krugman and Obstfeld suggests that no jump in investment occurred. So, a case can be made that the US current account deficit in the 1980s was a bad thing. Of course, as always, some people would make a different case. They might argue that the drop in  $S^{public}$  reflected a tax cut engineered by the Reagan administration with the idea that it would lead to an explosion in investment. They would argue that in the minds of the Reagan administration, future generations would happily pay higher taxes because of the increased wealth that the Reagan tax cut generated. They would argue that the fact that the explosion in investment did not actually occur does not defeat their belief that it was a good decision. Sometimes, good decisions do lead to bad outcomes. The rejoinder to this is that it was not a good decision in *any* sense. All respected economists in the early 1980s were arguing that the tax cuts would lead to huge deficits and did not believe that they would lead to an explosion in investment. And so the debate goes on.

### 2.2.3. Crony Capitalism

Here is a second example where a negative current account might be a bad thing. Suppose the government of a particular country offers guarantees to foreign lenders who finance domestic investment projects. This has the effect of reducing the foreigners' risk exposure, and so they are less reluctant to get involved with investment projects. This is likely to boost  $I$ , and produce a large current account deficit. But, this may not be a good thing. Government involvement in effect makes taxpayers part of the deal. If the investment goes well, the foreign lenders and the domestic borrower do well. If it goes bad, the foreign lender still does well, the domestic borrower's loss is limited, and the taxpayer picks up the real tab. Now, this may be fine if the government's decision to commit the taxpayer has carefully taken into account the interests of the taxpayer. But, if not, then in effect the interests of an important party to the transaction have not been taken into account. Interestingly, the 'taxpayer' in this example is not necessarily just a domestic citizen. In practice it may even involve taxpayers in the world as a whole. To the extent that international financial organizations stand ready to bail out governments that get into trouble, those organizations

in effect place the taxpayers of the countries they represent at risk. So, current account deficit may be bad if it is fueled by investments that are implicitly guaranteed by taxpayers, when the interests of those taxpayers have not been taken into account.

Are these concerns in practice? Many people say they are. A feature of the Asian economies that experienced financial crises in late 1997, is that their governments offered guarantees to foreign lenders. It is generally thought that when those guarantees were extended, the interests of the taxpayers were not fully taken into account. Asian governments are often accused of engaging in ‘crony capitalism’, where members of the government extended guarantees on projects run by family members or prospective business associates, without worrying about the interests of the taxpayers they represent.

#### **2.2.4. World Capital Markets in the 19th and 20th Century**

The International Monetary Fund report, which is on the web site, discusses the patterns of current accounts in the world from the 1880s to the present. This discussion is based on the research of Alan Taylor, of the University of California at Davis. The report shows that the average absolute value of current accounts in the world was at an all-time high in the late 19th century, dropped to nearly zero in the period extending from the First World War to the Great Depression and then started to climb very slowly in the post World War II period. Today, it has not yet reached the levels it was at in the end of the 19th century. The large current accounts in the 19th century reflected surpluses in Britain, France and Germany and deficits in the US, Argentina, Canada, Italy, Australia and other countries. The pattern of current account surpluses simply reflected a mechanism by which countries with a lot of wealth helped to build countries which, in the late 19th century, did not have much wealth and had difficulty generating much saving. The overall pattern was probably a good thing for all concerned. The shutting down of these flows is generally thought to have been a bad thing especially for capital importers like Argentina. The story behind this is fascinating, but beyond the scope of this class.

The attached table provides evidence on Argentina’s current account. Argentina represents an interesting case study. Alan Taylor has collected the relevant data, which is reported in Table 1, which is attached. Note how the saving rate,  $S/Y$ , was very low in the period 1885-1914. The investment rate,  $I/Y$ , was substantially higher and this is why the current account showed a significant deficit. Taylor argues that the main reason the saving rate was so low was the high dependency ratio in Argentina: the fraction of people 15 years old and younger was around 45 percent (see the figure taken from one of Alan Taylor’s papers). Societies with this many young children have difficulty generating their own saving internally. So, it is argued that the negative current account in the early period was a good thing for Argentina. Note that from the middle of the Great Depression to the present time, the current account has been nearly zero. Some have argued that this is part of a more general policy of being closed to the rest of the world, which was a disaster for Argentina. Note that according to the data, the zero current account did not prevent Argentina from having a high investment rate. As the country’s wealth grew and as the dependency ratio fell, the saving rate rose. However, Taylor has argued that the investment data are overstated because they were not properly measured.

### 3. The Balance of Payments

We have already been discussing how the current account, which measures international flows of goods, corresponds to changes in the quantity of international financial claims. If a country is running a deficit on current account - importing more goods and services than it is exporting - then it will be *exporting* asset claims: debt, equity, currency, etc. The international flow of these financial assets is recorded in the **capital account**. By their very nature, the capital and current accounts must add to zero:

$$\text{Current Account} + \text{Capital Account} = 0.$$

Or,

$$0 = \begin{aligned} &\text{The goods and services we send foreigners} - \text{the goods and services they send us} \\ &+ \text{The assets we send to foreigners} - \text{the assets they send to us} \end{aligned}$$

The current and the capital accounts together form what is called the balance of payments accounts.



**Table 1**  
**Argentina: Saving, Investment, and the Current Account, 1885–1989**

	S/Y	I/Y	CA/Y
1885–1889	-0.08	0.10	-0.19
1890–1894	0.02	0.10	-0.08
1895–1899	0.03	0.07	-0.04
1900–1904	0.07	0.09	-0.01
1905–1909	0.10	0.16	-0.06
1910–1914	0.06	0.14	-0.08
1915–1919	0.10	0.07	0.03
1920–1924	0.04	0.10	-0.06
1925–1929	0.11	0.13	-0.02
1930–1934	0.06	0.09	-0.03
1935–1939	0.11	0.11	0.00
1940–1944	0.13	0.10	0.03
1945–1949	0.15	0.12	0.03
1950–1954	0.15	0.16	-0.01
1955–1959	0.13	0.16	-0.03
1960–1964	0.20	0.20	0.00
1965–1969	0.28	0.27	0.00
1970–1974	0.25	0.25	0.00
1975–1979	0.30	0.30	0.00
1980–1984	0.20	0.22	-0.02
1985–1989	0.16	0.18	-0.02

Source: Appendix.

**Table 2**  
**Stocks of Foreign Investment in Less Developed Countries, 1900–1990**

	1900	1914	1929	1938	1967	1980	1990
A.							
Foreign Investment							
Latin America	2.2	8.4	6.5	5.5	9.0	20.7	27.7
<i>share of total</i>	0.35	0.54	0.59	0.47	0.55	0.45	0.37
Asia	1.8	5.1	3.7	4.8	4.7	13.7	30.7
<i>share of total</i>	0.29	0.32	0.34	0.41	0.28	0.30	0.41
Africa	2.3	2.3	0.7	1.4	2.8	11.0	16.1
<i>share of total</i>	0.37	0.15	0.06	0.12	0.17	0.24	0.22
Total	6.3	15.7	11.0	11.6	16.5	45.5	74.5
B.							
Foreign Investment/GDP							
Latin America	1.20	2.71	1.26	0.87	0.33	0.33	0.47
Asia	0.17	0.40	0.23	0.26	0.11	0.15	0.32
Africa	1.33	1.17	0.24	0.35	0.23	0.34	0.74
Total	0.44	0.89	0.45	0.41	0.20	0.24	0.42

Notes: Total stock of foreign investment and GDP in billions of U.S. dollars at 1900 U.S. prices. Weighted averages in each region.

Source: Twomey(1996, Tables 2 and 4).

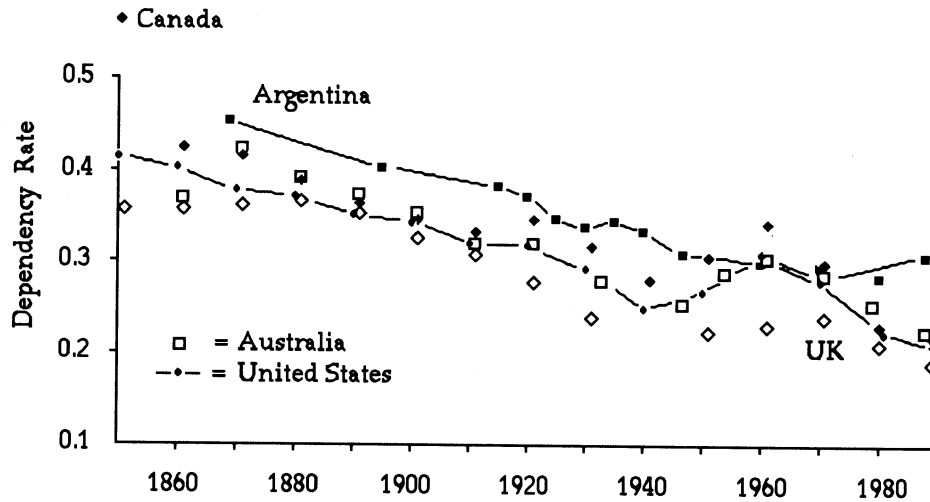


FIGURE 2

## DEPENDENCY RATES FOR A SAMPLE OF COUNTRIES, 1850-1990

Note: The dependency rate is the share of the population under 15 years of age.  
Sources: See the Appendix.

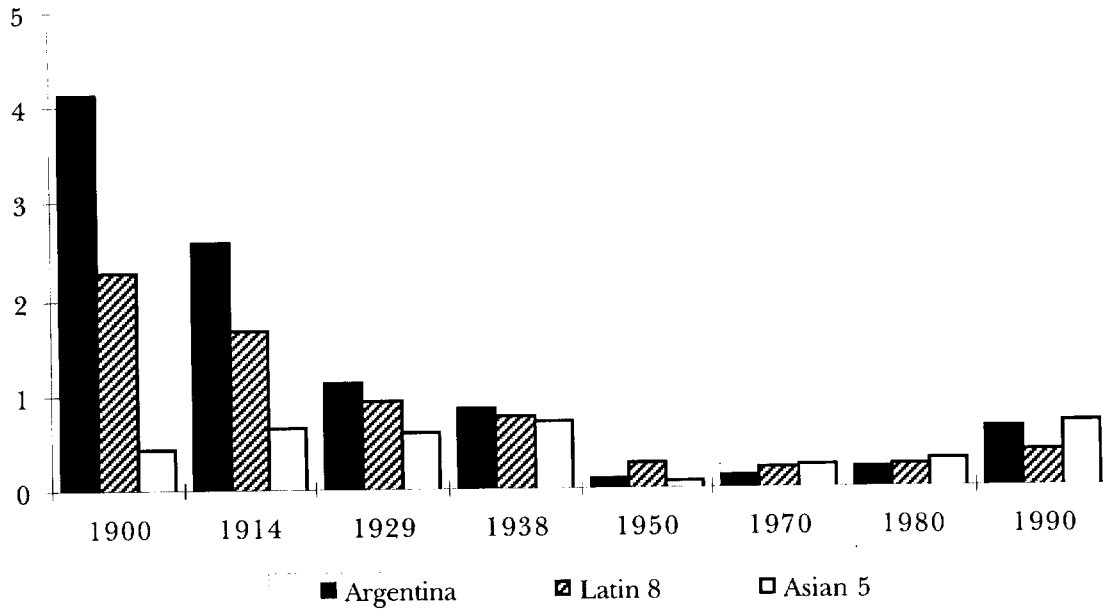
the extent that migrants self-select from young adult age-groups (which they do), the population of reproductive age may be further enlarged.<sup>19</sup>

A convenient measure of shifts in the age structure is the *dependency rate* (defined here as the share of the population under 15). Figure 2 traces the evolution of the dependency rate in five economies: four in the New World (the three settler economies and the United States) plus the United Kingdom. The figure reveals that the New World group had much higher dependency rates in general, an observation consistent with the theory I've outlined. The Australian and North American dependency rates exhibited only a small percentage point gap relative to the British level in the 1890 to 1929 period, but the Argentine dependency rate gap was about twice as large. Furthermore, the dependency rate followed a pattern of secular decline in all countries: essentially a demographic transition associated with a shift to lower fertility rates and the eventual long-run dynamic equilibrium of the age structure. Given the dependency rate gap, Argentina lags behind the other New World economies in the demographic transition by a decade or two.

The foregoing is, in effect, a characterization of Argentina as a "late starter," an economy whose developmental process did not get started until very late in the nineteenth century, relative to others. Consequently her heavy migrations came later, and her demographic transition took longer to engage. This sluggish start, I claim, left Argentina more vulnerable to the economic shocks associated with the Great War than were the other settler economies—the demographic burden de-

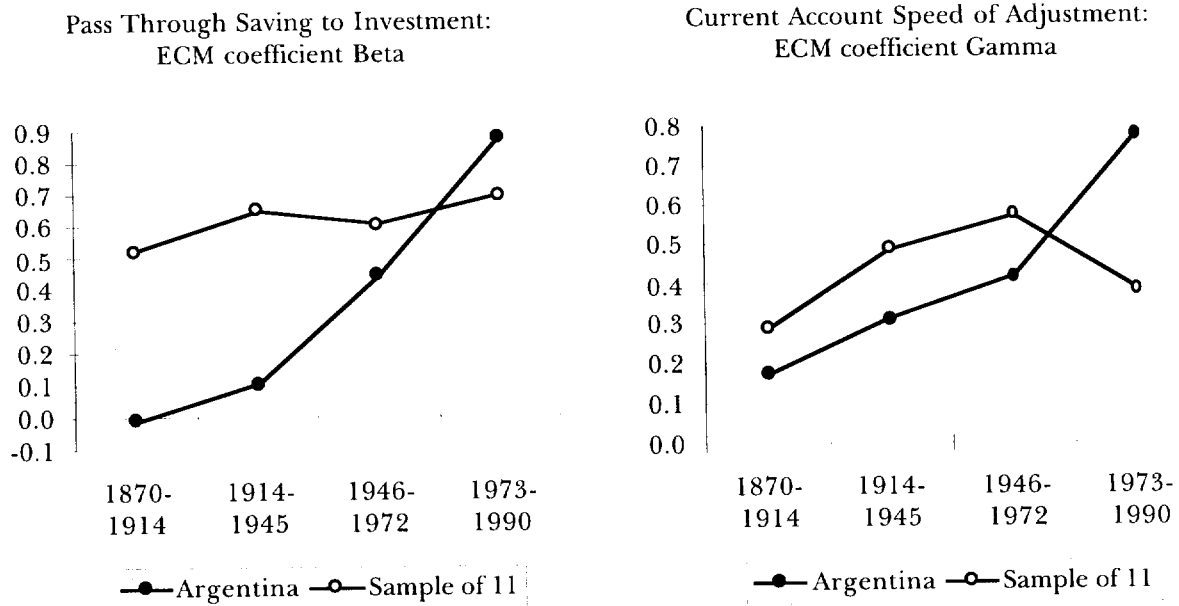
<sup>19</sup> Hall, "Long Period Effects."

**Figure 3**  
**Foreign Investment in Latin America and Asia, 1900–1990**  
 Foreign Investment as a share of GDP



Source: Table 3, simple unweighted averages.

**Figure 4**  
**Saving-Investment Relationship: Argentina versus a Sample of Eleven Countries, ECM Estimates**



Notes: See text and Table 7.