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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 Econ 311. 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 equation shows how GNP can be measured according to the **expenditure approach**, by adding across what different categories of economic agents bought. Because the expenditure approach is emphasized extensively in economic analysis, the above equation is given a special name, the **national income identity**. The **income approach** to GNP measures GNP simply by adding up everyone's income.¹ The **value-added approach** measures GNP by adding up all the value-added of different types of firms. In particular, it adds up the value-added of manufacturing firms; firms in agriculture, forestry, fishing, and hunting; mining firms; construction firms; utilities firms; and firms in wholesale and retail trade. The reason for 'value-added' is that if you simply add up all the goods each firm sells, you massively double count total output. For example, if you add the bread sold by the baker plus the wheat sold by the farmer, you are in effect counting the farmer's wheat twice, since a large component of the bread sold by the baker is the wheat. The value-added of a firm is just what it sounds like: it's the value that the firm adds to whatever goods it buys from

¹There is a small distinction between GNP and National Income, which we ignore here. See KO, page 282 for discussion.

other firms. A firm's value-added is its sales, minus whatever purchases it made from other firms.

In 1991 the US. switched from emphasizing Gross National Product (GNP) as the basic measure of total output, to Gross Domestic Product (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. There are 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 is much larger than its GNP. The Krugman and Obstfeld book uses the concept of GNP, and so that is the concept of aggregate 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

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

Second, write

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

where $CA = EX - IM$. This is the standard way of writing the national income identity. This says that total output equals total consumption expenditures plus total investment expenditures plus government expenditures, plus the current account, or net exports.

2. The Current Account

The national income identity can be rewritten:²

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

²Treating the current account as exactly equal to net exports is an approximation. See the course textbook for further discussion.

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 scenario in which the money simply stays abroad occurs if the car seller just sits on the 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 interest-earning assets. 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 currency abroad. In fact, 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, and that bank buys a US asset on behalf of the depositor. 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 2003. Then, in billions of dollars:

$$Y = 11,004.0, C = 7,760.9, I = 1,665.8, G = 2,075.5, EX = 1,046.2, IM = 1,544.3$$

In this case,

$$C + I + G = 11,502 > Y$$

which exceeds Y by \$498 billion. Since expenditures on goods and services exceeded output of goods and services by \$498 billion, the difference must have come from abroad. In fact, imports exceeded exports by \$498 billion. That is, the current account was $-\$498$ billion, or 4 percent of gross output. In 2004 this number grew to 5.2 percent of GNP.³

³These numbers are taken from Table B-2 at <http://a257.g.akamaitech.net/7/257/2422/17feb20051700/www.gpoaccess.gov/eop/tables05.html>

Note these numbers actually pertain to GDP, not GNP.

It's interesting to see how gross output breaks down into different value-added components and different income components. According to the Bureau of Economic Analysis (BEA), value-added in government was 11 percent of gross output in 2004 and only 5 percent of gross output in 1929. Government has grown greatly in importance. Value-added in farming, by contrast, has shrunk. In 1929 it represented 8.6 percent of gross output, and by 2004 it had fallen to only 1 percent of gross output. The drop in employment in farming is twice as great, reflecting the enormous strides in farm labor productivity. In 1929, 8 percent of all full-time equivalent employees were employed on farms. In 2004 that number was 0.5 percent.⁴ All these data can be found by going to the Bureau of Economic Analysis link on the course web page.

Data from the BEA can also be used to determine what has happened to the share of income earned by labor, as opposed to capital and profits. The BEA breaks out 'compensation of employees' and 'proprietor's income', as well as 'national income'. The ratio of employee compensation to national income probably is not a good estimate of the share of income going to labor, since proprietor's income is probably best thought of as including some return to labor. To see why, proprietor's income includes the income of people who own things such as a grocery store, or a gas station. The income of these people is partly a return to the capital they have in their business: the building, the equipment, etc. However, it is also in part a return on they labor effort. The BEA does not break out the labor income component of proprietor's income, but we could estimate it by supposing that the share of proprietor's income going to labor is the same as the share of national income going to labor. Let the share of income going to labor be denoted by α . Then,

$$\alpha = \frac{\text{compensation of employees} + \alpha \times \text{proprietor's income}}{\text{national income}}.$$

Using the data from the BEA, we find that $\alpha = 0.71$ in 2004 and $\alpha = 0.64$ in 1929. So, labor's income has risen somewhat from around 65 percent of national income to around 71 percent. Given the crude nature of these calculations, perhaps it is safest to conclude that this evidence suggests there has been little, if any, change.⁵

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:

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

⁴The 1929 data were taken from Table 6.5A. The 2004 data were taken from Table 6.5D.

⁵By going to the BEA web site, once can confirm that for 2004 one solves for α in:

$$\alpha = \frac{6687.6}{10275.9} + \alpha \frac{889.6}{10275.9},$$

or,

$$\alpha = \frac{\frac{6687.6}{10275.9}}{1 - \frac{889.6}{10275.9}} = 0.71.$$

For 1929,

$$\alpha = \frac{\frac{51.1}{94.2}}{1 - \frac{14.2}{94.2}} = .64.$$

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, $S^{public} = T - G$. We call S **national saving**. National saving arrives in financial markets in the form of savings deposits, purchases of government debt, purchases of stock and debt, etc. In 2003, the supply of saving was \$1,167.6 billion. It's interesting to break this down into its private plus public components. Since T was \$1,717.7 billion in that year, disposable household income, $Y - T$, was 1,1004.0 - 1,717.7 = \$9,286.3 billion.⁶ Thus,

$$S^{private} = Y - T - C = \$1,525.4 \text{ billion}, \quad S^{public} = T - G = -\$357.8 \text{ billion}.$$

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

$$S = 1,525.4 - 357.8 = \$1,167.6 \text{ billion}.$$

At the same time, the demand for saving for purposes of US investment came to more than that, \$1,665.8 billion. The difference is $S - I$, and was supplied by foreigners. It is called **net foreign investment**, and amounted to -498.2 billion. 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 2003 of 498.2 billion dollars. Where did those 498.2 billion come from?

According to the national income accounts, the excess of imports over exports was 498.2 billion in 1992. That's where the extra money came from. Americans gave foreigners \$1,544.3 for the goods and services they bought from them (i.e., imports). Foreigners returned \$1,046.2 to the US in exchange for the goods and services we sent to them. In this way, foreigners accumulated $1,544.3 - 1,046.2 = 498.1$ 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.

⁶Government tax revenues, T , were approximated using the numbers in Table B-82 in <http://a257.g.akamaitech.net/7/257/2422/17feb20051700/www.gpoaccess.gov/eop/tables05.html> on the Economic Report of the President link on the course web site. Those numbers report results for Federal, State and Local Government expenditures and receipts. A problem, from our point of view, is that government expenditures are not G , they are G plus transfer payments, and a first cut at thinking about transfer payments is to think of them as a subtraction from taxes. The value of T (i.e., tax receipts net of transfer payments) is obtained by first computing government expenditures minus receipts in 2003, or \$357.8 billion. Then, $T = 2,075.5 - 357.8 = \$1,717.7$ billion.

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. Additional discussion may be found in the Economist Magazine article on the course website.

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. Crony Capitalism

Here is an 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, a 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.

2.2.3. The US Since the 1980s

Consider Figure 1, which displays the US current account since the 1960s. Note how something changed in the early 1980s when the current account suddenly went negative by about 5 percentage points of gross output. To understand why it went negative, it is useful to see whether the decline was due to a fall in S or a rise in I . Figure 2 displays S/Y and I/Y . Note how the latter, while it fluctuates a lot, seems to be fluctuating around a constant level. In contrast, S/Y begins to fall in the early 1980s and falls by about 4 percent of gross output by the present time. So, the main culprit appears to be a fall in national saving. We can further ask whether the fall in national saving reflects a rise in household or government consumption. Figure 3 displays G/Y and C/Y . From that figure it is clear that G/Y cannot have anything to do with the fall in the current account. If anything, G/Y has fallen a percentage point or two. Instead, it is a rise in C/Y that accounts for the fall in the national saving rate.

So, why has C/Y risen? Ben Bernanke, the nominee for Chairman of the Fed, has a hypothesis, which he refers to as the ‘global savings glut hypothesis’. In a nutshell, the idea is that for various reasons, people in other countries have resolved to increase their saving. The reasons include that in several important countries, such as China, Japan and Europe, populations are ageing and older people save more. At the same time, the best investment opportunities appear to many to be in the US (there is a speech by Greenspan on the website, in which talks about how productivity growth in the US has been higher in recent years than in the rest of the world). As a result, people all over the world have demanded dollars in order to purchase US assets. In the process, they have bid up the price of those assets. Figure 4 (taken from Kraay and Ventura’s Figure 3 in their NBER working paper 11543, available on the website) shows that, although stock markets all over the world rose in the 1990s, the US market rose by more. US citizens experienced a huge capital gain from this, and responded to their increased wealth by saving less. This general hypothesis suggests that the US current account deficit, the US stock market boom and the low US saving represent the consequences of same basic forces.

It’s interesting to see who is running the current account surpluses the correspond to the US current account deficit. The attached Table 2 shows that it is Asia and the major oil exporters. The Euro Area is running a current account surplus, but it is very small, and plays essentially no role in the financing of the US current account deficit.

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

The International Monetary Fund report, which will be placed on the course 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, and that this 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 **financial account**. By their very nature, the financial and current accounts must add to zero:

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

Or,

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

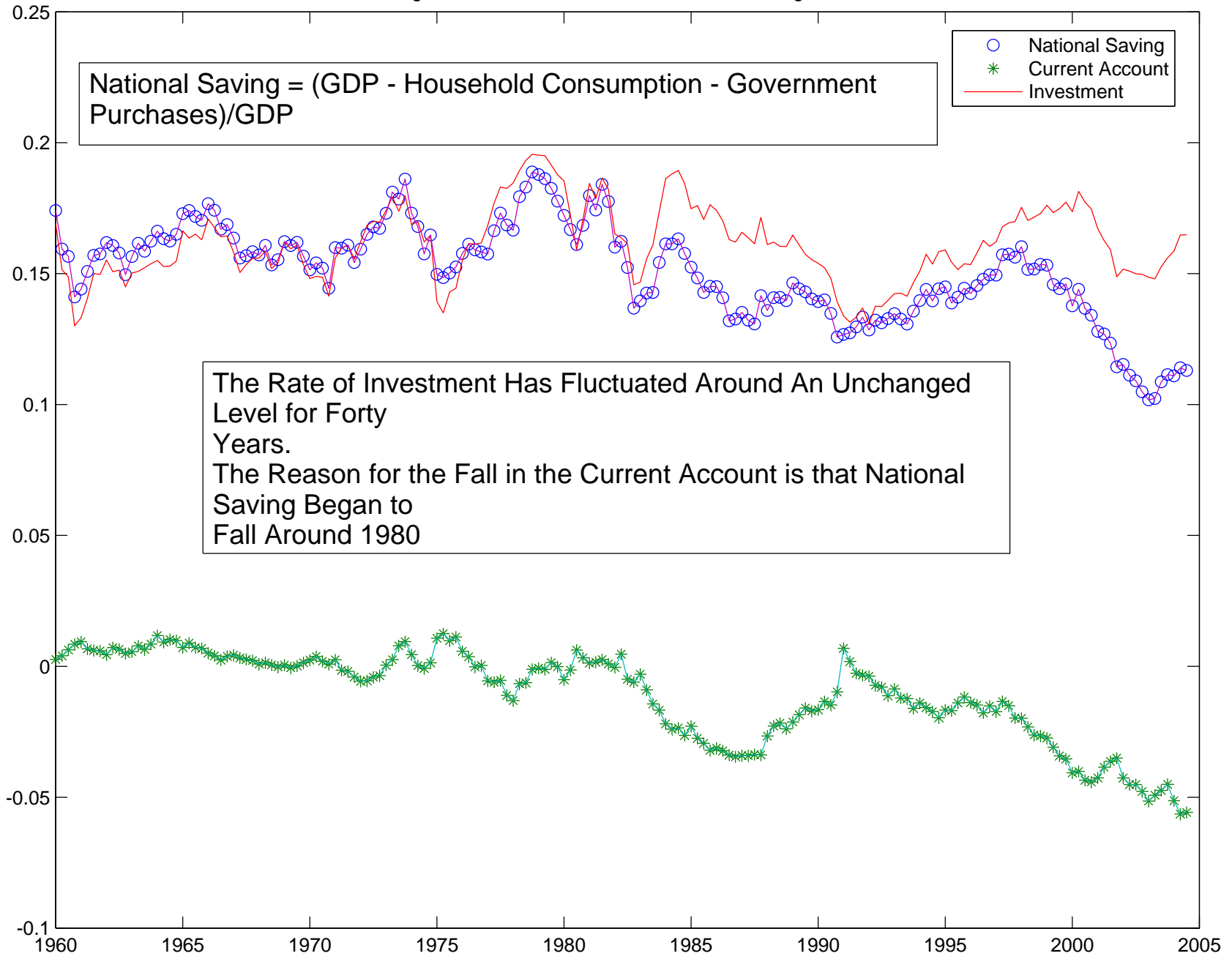
The current and the financial accounts together form what is called the balance of payments accounts.⁷

⁷I have left out the current account, a small component of the balance of payments. See KO, page 296.

Figure 1: US Current Account Divided by GDP



Figure 2: The Current Account, National Saving and Investment

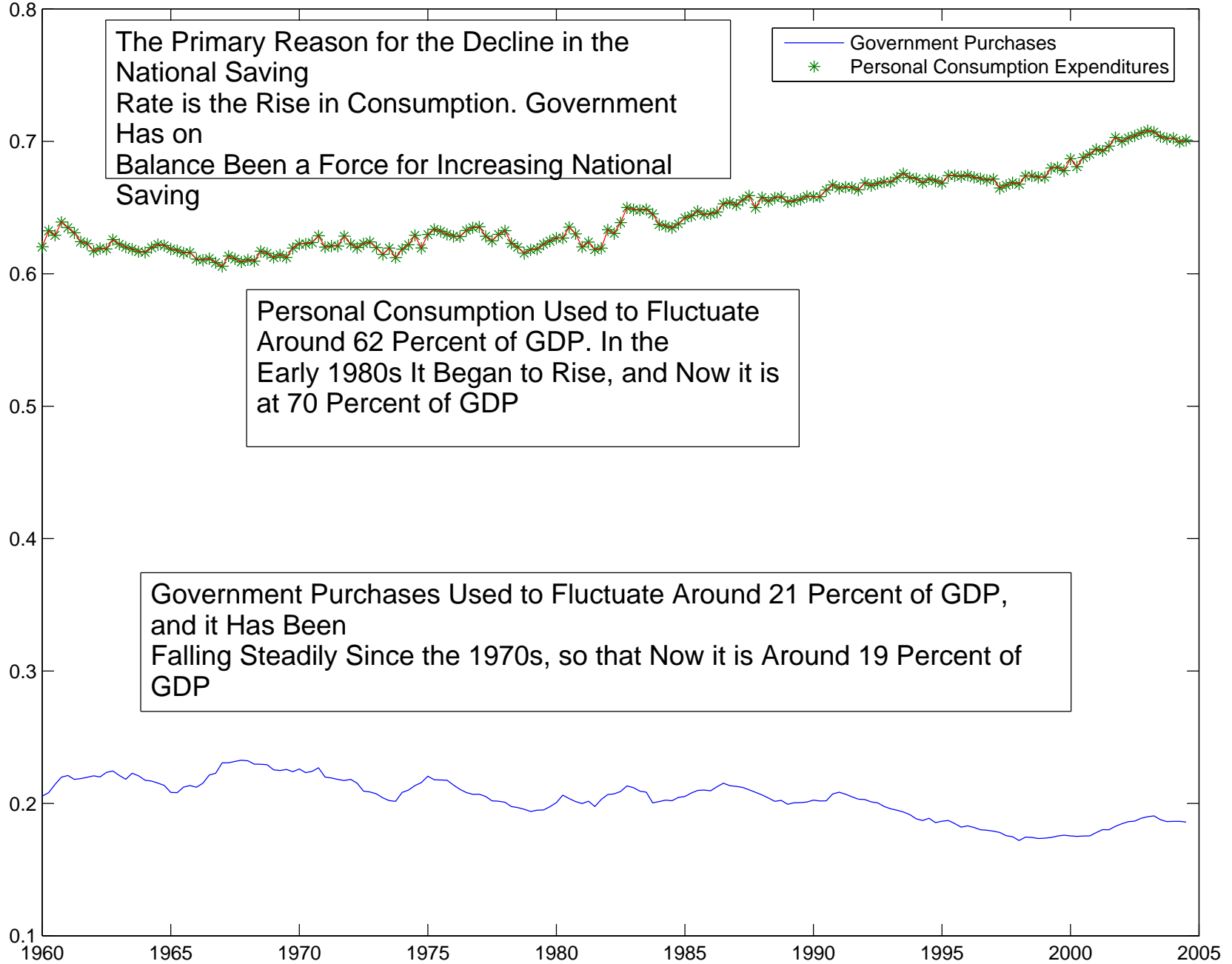


National Saving = (GDP - Household Consumption - Government Purchases)/GDP

- National Saving
- * Current Account
- Investment

The Rate of Investment Has Fluctuated Around An Unchanged Level for Forty Years.
The Reason for the Fall in the Current Account is that National Saving Began to Fall Around 1980

Figure 3: Diagnosing the Reason for the Fall in the National Saving Rate



The Primary Reason for the Decline in the National Saving Rate is the Rise in Consumption. Government Has on Balance Been a Force for Increasing National Saving

Personal Consumption Used to Fluctuate Around 62 Percent of GDP. In the Early 1980s It Began to Rise, and Now it is at 70 Percent of GDP

Government Purchases Used to Fluctuate Around 21 Percent of GDP, and it Has Been Falling Steadily Since the 1970s, so that Now it is Around 19 Percent of GDP

Figure 4: Stock Market Boom of the 1990s

Share Prices

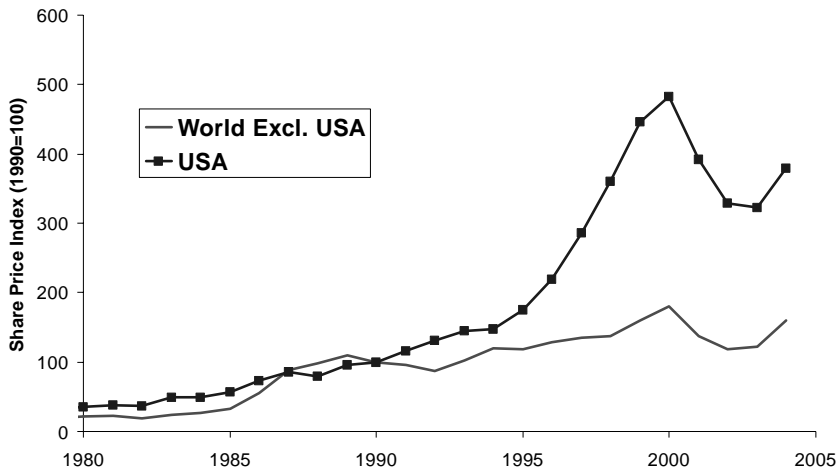


TABLE 2. CURRENT ACCOUNT BALANCES (\$bn)			
	1995	2002	2005²
United States	-114	-475	-759
Euro Area	49	49	24
Asia	72	244	341
Japan	111	113	153
China	2	35	116
Major Oil Exporters ¹	8	92	398

Source: IMF

Figure 58. Net Capital Outflows, 1880–1913
(In percent of GDP)

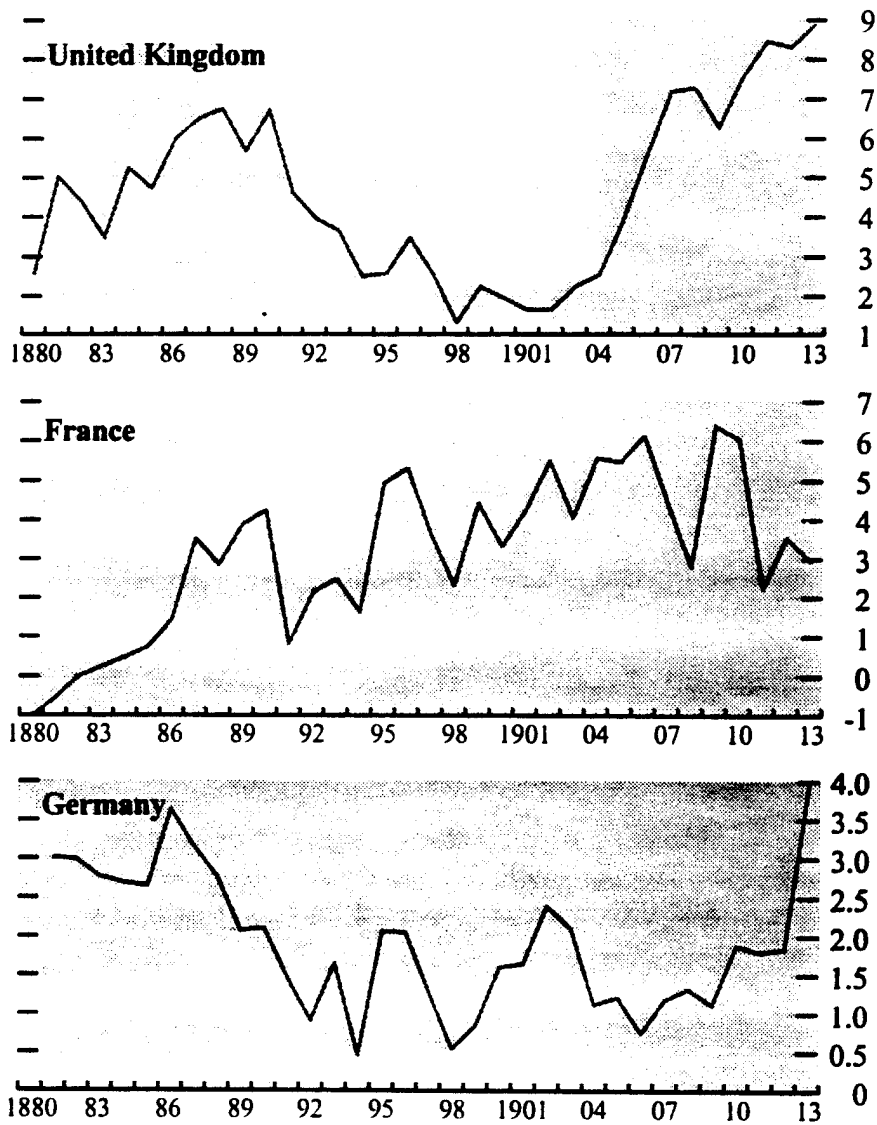
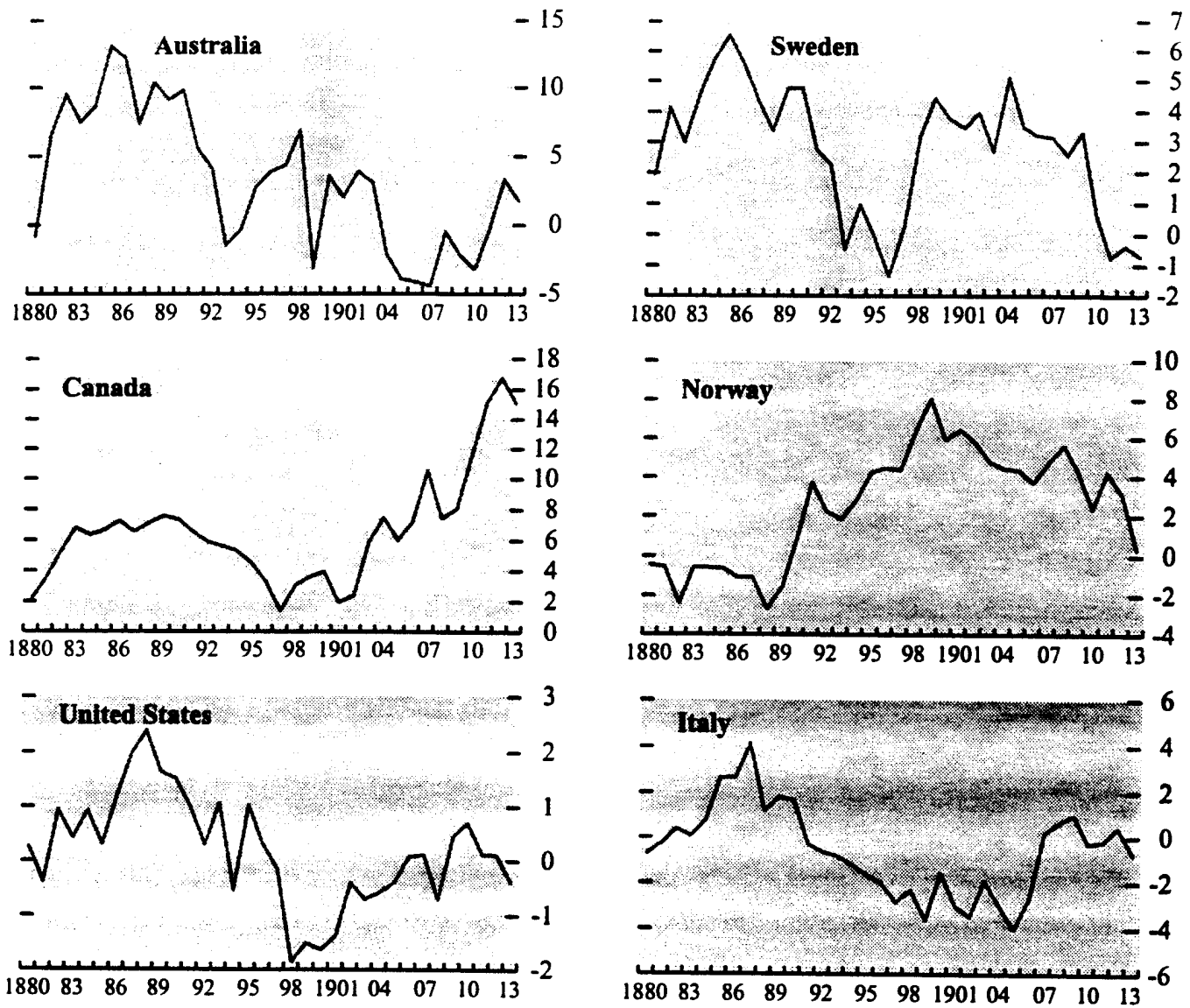


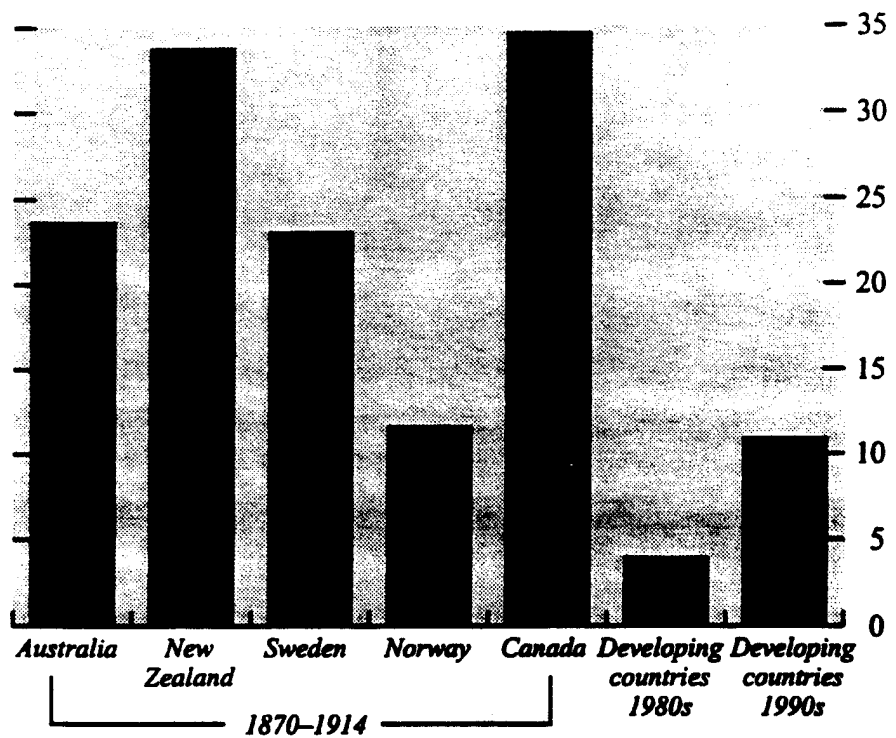
Figure 59. Net Capital Inflows, 1880–1913

(In percent of GDP)



Source: Bloomfield (1968).

Figure 60. Contributions of Capital Flows to Investment, 1870–1914 versus 1980–90s
(Ratio of capital flows to investment)



Sources: Bloomfield (1968); and International Monetary Fund, *World Economic Outlook*.

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.