

Balance of Payments Accounting
and
National Income Accounting

Chapter 1
Econ 666: Issues in International Finance
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Accounting

I. Introduction

We begin our study of the international economy with accounting. We won't be looking at the accounts of a multinational firm or of a household, but instead of an entire economy. We look at two different types of accounts. The first is the **balance of payments accounts**. These accounts record all of the transactions of one country with the rest of the world.¹ The U.S. balance of payments accounts record American exports of goods and services, as well as trade in assets such as U.S. Treasury bonds, shares of Google stock, or American investments in Chinese factories.

The second account we will look at is the **national income accounts** for a country. You will already be familiar with these accounts from previous classes you have taken in macroeconomics. These are the accounts that record the transactions that constitute a country's gross domestic product. Recall that gross domestic product is the value of final output that is newly produced during a given time period such as a quarter or year. We can measure GDP by calculating the *value of all final output* sold or by calculating the value added of each producer and summing up the value added over all producers. There is a close relation between GDP and *national income*. The value of what we produce goes as income to somebody – firm owners, landlords, workers, or foreigners. American national income is the total income earned by Americans – which includes the profits, rents, and wages Americans earn within the U.S. and also their income earned abroad. Also, we can classify the value of final output by *expenditures* – consumption goods and services bought by households, investment goods bought by firms (although the investment category also includes purchases of newly built houses used as residences), goods and services purchased by the government, and exports of goods and services. We will focus on the open-economy aspects of these national income accounts.

It is hard to think about concepts like trade imbalances or the capital flows or the macroeconomic effects of monetary and fiscal policy without a firm understanding of these accounts, but it is also important to understand that the relationships we look at in this chapter are simply *accounting relationships*. There is no economic model that lies behind these numbers. These accounting identities (an **identity** is a relationship among variables that must be true by definition) are true independent of any economic model that we might want to use to understand how the macroeconomy works. An example of an identity coming from outside economics is the relationship between temperature measured in degrees centigrade and temperature measured in degrees Fahrenheit. If $X^{\circ}\text{F}$ is understood to mean “X degrees Fahrenheit” and $Y^{\circ}\text{C}$ means “Y degrees centigrade”, X and Y are related by the identity:

¹ We will see that the accounts also record some transactions between foreigners – if a foreign central bank sells an American Treasury bond to a foreign private actor (business or household), the transaction still will be recorded on our balance of payments accounts.

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$$Y^{\circ}C = \frac{5(X^{\circ}F - 32)}{9}.$$

This formula does not provide any theory about what determines the temperature tomorrow, but it does tell us that we cannot have separate theories about what determines the temperature in Fahrenheit and the temperature in centigrade. Any theory must be consistent with the identity relating the two measures of temperature.

For example, consider a country's current account balance. You may already know that the current account balance is a record of a country's trade in goods and services: its exports of goods and services minus its imports of goods and services. When politicians or bloggers talk about the current account imbalance of the U.S., they talk about the fact that the value of U.S. imports greatly exceeds the value of American exports. To the extent that imbalance is a problem, it is usually thought of as a problem with trade. The U.S. imports too much, or doesn't export enough. We will learn about an accounting identity that tells us that the current account balance is also equal to a country's national saving minus its investment (its purchases of newly produced structures and equipment.) Saving minus investment sounds a lot less like an international trade issue.

This example demonstrates both the usefulness of understanding accounting identities and the limitations. A policymaker that is interested in reducing the U.S. current account deficit (the deficit is the value of its imports less the value of its exports) probably thinks about policies that affect trade. Sometimes a politician might propose a tariff or other trade restriction to reduce the amount of U.S. imports. Since the current account balance also is the country's national saving minus investment, any policy that changes the current account balance must work by changing either saving or investment or both. How is a tariff on imports supposed to affect saving? That is, why would increasing the price of foreign goods make Americans save more? Why wouldn't Americans simply switch their spending from foreign goods to American goods without necessarily spending less overall? Or, is a tariff supposed to work by reducing the amount of investment in America? Again, why would it have that effect? Since the current account balance equals not only exports less imports but also national saving less investment (and that relationship is an identity), a policymaker should be prepared to explain why his or her proposal will not only affect the relationship of imports to exports, but also the balance between national saving and investment.

On the one hand, understanding this accounting identity puts some restrictions on the story that we can tell. Any vision of the workings of the economy has to satisfy accounting identities. On the other hand, accounting identities are not economic theories.

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The example of the current account balance can show us why accounting relationships doesn't really tell us how the economy works. Suppose that for some reason, American households decide they want to save more. Maybe they have just become convinced that being more frugal will make them happier in the long run, though maybe it is also some tax incentive that increases their willingness to save. What I have in mind here is that Americans increase the fraction of their annual income that they direct toward saving – perhaps they put more money in the bank, increase their retirement nest egg, or build up their stock portfolios. In any case, doesn't our accounting identity tell us that the current account balance for the U.S. must increase – that national saving minus investment must rise? The answer is no. We need to understand what the impact of this increased desire to save is on the economy as a whole before we can say that it increases the U.S. current account balance (or reduces the U.S. deficit.) Even if this change does increase national saving, it might have an effect on the level of investment in the economy. We have to trace through the impact on markets, in equilibrium, of this change in desired saving. For example, if households desire to save more, that might reduce the equilibrium interest rate required for savers. In turn, lower interest rates may induce firms to borrow more to finance investment in new factories or computers. So national saving may rise, but maybe investment will increase as much, with no change or even a negative change in saving minus investment.

That's not all. Even ignoring the effect on investment, an increase in the rate of saving by households might not even increase national saving. National saving includes not only saving by households, but also saving by corporations and government. Corporations save when they retain profits instead of paying them out to shareholders as dividends. The government saves when its tax collection exceeds its outlays. Maybe if households save more, corporations or governments react by saving less. For example, corporations might retain earnings because they want to have funds available for expansion of their businesses. If households save more, they are spending less of each dollar of income. Firms might decide there is less need to keep a pile of funds available for future investment because consumers won't be buying their goods, so they might reduce their corporate saving. Or, the government might react to higher household saving by following fiscal policies that help increase aggregate demand. They might cut taxes or increase spending. Either of these policies would reduce government saving. So even if household saving rises, corporate saving and government saving may fall enough to leave national saving unchanged.

Indeed, if every household decides to save a greater fraction of their income, total household saving may actually fall according to some economic theories. That seems impossible. How could total household saving fall if all households decide to increase their saving rate? This is called the Paradox of Thrift. It's an example of why we need economic models, not just accounting identities, to understand the effects of policies. Briefly, under this theory, at least in the short run the level of output of firms in the

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economy is determined by the level of demand for their products. Suppose all households decide to increase their saving rate. That means they consume less. If they consume less, firms will produce less. If firms produce less, there is less income for everyone – firm owners, households and everyone else in the economy. If people earn less income, they will have less to save. Even though everyone might be saving a larger share of their income, total income might fall enough that total household saving might fall.

This last example is hard to understand without a formal model. That is an important point. To see how this economic theory works, we need some equations, or maybe at least some graphs, or perhaps both. Macroeconomic theory is not easy to understand. It isn't easy to see how the different parts of the economy interact with each other to produce equilibrium outcomes. To analyze the macroeconomy, one needs a mathematical model. When you read the blogs or the speeches of politicians, a lot of times what is written or said sounds plausible. But to see if it really makes sense, you need to see the model, to analyze the model, to break it down and see what is going on.

In introductory economics classes, you may have been told that you need to “think like an economist.” Usually, thinking like an economist means thinking about microeconomic problems the way an economist does. You frame the question. You think about the objective – what are you trying to maximize? You understand the importance of thinking about the marginal effects of decisions. But in this class, thinking like an economist really means something else, because it involves trying to understand how different economic forces interact to achieve the economic outcomes that we see. You need to think like a macroeconomist, or maybe like an equilibrium economist.

Here are two examples. They both involve taxes, and they both are examples of how higher taxes are less damaging to the economy than you might initially think. Maybe these are examples of why businessmen really are not the best economic policy advisers – because they understand things from the perspective of how a policy affects their business, but not from the perspective of how it affects the equilibrium of the economy. But the difference in “micro” perspective and thinking like a macroeconomist or like an equilibrium economist comes up all the time in macroeconomic analysis.

First example: I used to live in Seattle and worked out regularly at a gym near where I lived. In Seattle, sales tax rates were pretty high. I think they may have been around seven percent. But health club memberships were not subject to the tax. However, in an effort to broaden the tax base, some legislators proposed extending sales taxes to sales of all types of services: attorney fees, haircuts, and many other services including gym memberships. The owners of my gym were upset by this and led a petition drive to defeat the idea. I was surprised by how sophisticated they were as businesspeople. They really knew their stuff. I talked to them about this, and it was

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apparent that they had a very good idea of how much business they would lose if their membership fees effectively went up seven percent because of this tax.

It was also clear that they had no way at all to think about the equilibrium effects – or even that there was such a thing. When they talked about how much business they would lose if their fees went up seven percent, they were thinking about what would happen if they tried to increase the price by seven percent and none of their competitors changed their price. Sure, they would lose some business. But a lot of business they lost would be to other gyms that did not raise their prices. If the sales tax were imposed, however, it would fall on all gyms. Holding all else constant, every gym's fees would effectively rise by seven percent. That situation is different than what would happen if my gym raised its fees and no other gym did. For sure, the sales tax would cause the gym to lose business. Probably overall spending in Seattle would fall, and especially spending on services in general. But this drop would be spread around all of the health clubs. My health club wouldn't lose business to the gym down the road. The owners of my gym had not understood or taken into account the effects of broadening the base of the sales tax on the equilibrium of the economy in Seattle.

Second example: You have probably heard a lot about how higher income taxes reduce the incentives to work. In some countries at some times, marginal income tax rates (the tax rate on the last dollar earned) for top earners have been as high as 90 percent or more. They were over 90 percent in the U.S. in the 1950s and early 1960s, and around 70 percent in the 1970s. Surely people's incentive to go to work is dampened when tax rates are that high. While the top marginal tax rate dropped in the 1980s to 50 percent and now is only 39.6 percent, there is still a great deal of concern that tax rates are too high and provide a large disincentive to work.

At a micro level, some economists might challenge this notion. There is both a substitution effect and a wealth effect that determine how income taxes affect the incentive to work. The substitution effect is what you have heard about – when your taxes are high, you substitute away from the consumption goods that you could buy if you worked more and earned more income, and toward “leisure” – the pursuits you follow when you're not at work. The wealth effect might go the other way. If the government is taking too much of your income, you might decide to work more in order to restore your purchasing power. There is an ongoing debate among labor economists about how large these two effects are. There is evidence that the importance of the two effects differs between men and women, between young and old, between married and unmarried, etc. According to many measures, for the U.S. as a whole, the two effects about balance, so higher taxes do not have much influence on the incentive to work.

This analysis is focused too narrowly. What matters are the macroeconomic effects, or the equilibrium effects. Suppose the substitution effect prevailed, and workers

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really did decide to work a lot less when taxes increased. Would there necessarily be a large decline in hours worked? The answer depends on how the economy reacts, in equilibrium. If the effect of higher taxes is to lead workers to supply less labor, there will be a shift backward in the labor supply curve. Labor will become scarcer, and that will drive up the wage paid to workers. In equilibrium, income is taxed at a higher rate, but wages are higher. Surely after tax wages will fall in equilibrium, but not by the full amount of the tax increase. The increase in equilibrium before-tax wages will modify the direct effect of higher taxes. Realistically, this equilibrium effect on wages might not kick in right away if taxes are increased. The adjustment might take a number of years.

But then, if the supply of labor is reduced, there may be further reactions in the economy. Perhaps firms will reduce their investment in capital over time, because with fewer workers available, the marginal product of capital declines. Then with less capital available, the marginal product of labor falls, and indeed the equilibrium wage will fall. Other outcomes are possible too – businesses may invest in research to find labor-saving machines that can replace workers, or make workers more valuable. Without a model and some evidence, it is hard to say how ultimately an increase in labor taxes will affect the macroeconomy.

One more theme that will be emphasized throughout the course is the difference between **endogenous** and **exogenous** variables. Endogenous variables are economic variables that are determined within our model, while exogenous variables are ones that are outside the scope of our theory. For example, prices and quantity sold of goods are usually endogenous in an economic model. An exogenous variable might be something like the weather, which could influence economic outcomes but is not itself determined by economic behavior. Sometimes one model will assume a variable is exogenous, but another model of the same phenomenon will assume the variable is endogenous. A good example is the interest rate set by the central bank. Sometimes a model will examine how the macroeconomy works, taking the interest rate as exogenous. That means that we might examine the effect of some exogenous change, like an earthquake, on the economy, but hold constant the response of monetary policy. Another modeler might not want to hold monetary policy constant. That economist might note that the central bank usually tries to stimulate the economy if it is hit by a negative shock like a bad earthquake, so the model will make the interest rate endogenous. Which variables should be treated as endogenous and which as exogenous is often a matter of judgment by the economist. It depends on which set of assumptions works best for understanding the economic problem at hand.

One thing we never want to do is to ask how a change in one endogenous variable affects another variable. Consider the market for tomatoes. Can we ask how a change in the price of tomatoes affects the quantity produced and sold? (Tomatoes are not really storable like corn – if a tomato is produced, the grower wants to sell it, so the quantity

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produced and the quantity sold are the same, setting aside those tomatoes that get spoiled or damaged on their way from the farmer to the consumer.) Why doesn't that question make sense? It's because price is an endogenous variable. From the perspective of a household, the price of a tomato is exogenous. I can go to the store and look at the price and decide how many tomatoes to buy. I don't have any effect on the price of tomatoes – I take its price as exogenous. The tomato farmer also takes the price as exogenous. The farmer doesn't have any power in the market – there are thousands of tomato growers, and no one producer grows enough to influence the market price. If the price is higher, the farmer wants to grow more. Higher prices mean the consumer wants to buy less and the producer wants to sell more. We can't ask how a higher price affects the quantity sold. The quantity sold and the price are determined together by the intersection of the supply curve (which comes from the supply of all farmers) and the demand curve (which comes from the demand by all households.) We could ask about exogenous changes. What's the effect of a snowstorm in California in June? That would probably wipe out a significant amount of the tomato crop – there would be fewer sold and the price would rise. What happens if Beyoncé starts a fad by wearing clothes made from tomatoes? The demand for tomatoes would increase, driving up the price and inducing farmers to grow more. We can ask about the effects of changes in exogenous variables on endogenous variables, but we can't ask how one endogenous variable affects another.

We will encounter this problem many times in this course. What makes the problem especially difficult in macroeconomics is that so many variables are endogenous in the macroeconomy as a whole. When we look at the market for tomatoes, it would be reasonable to treat the business cycle as exogenous to the market. We can ask how a recession might affect the market for tomatoes. The tomato market itself probably does not have much of an effect on the macroeconomy, so we could treat the overall income and employment level as exogenous when we examine the demand and supply of tomatoes. We obviously can't treat those variables as exogenous when we look at the economy as a whole. To understand what makes the economy tick, we need to understand not only the economic relationships among variables; we also need to have some ideas about the exogenous changes that move the economy. When we discussed how saving changes might affect the current account, we carefully considered an exogenous change in the rate of saving. We asked what would happen if people became more frugal, or if the legislature introduced a tax incentive for saving. We didn't ask how an increase in total saving affected the current account, because we wanted to think about total saving as endogenous. Total saving was determined by how corporate saving and government saving reacted to the increase in the household saving rate, and in fact how total household saving changed when the saving rate increased (the paradox of thrift.) One last thought on this matter: Remember, sometimes it is reasonable to treat an economic variable as exogenous, but in other circumstances we might want to treat it as endogenous. When we ask, for example, "How does a change in the exchange rate affect the current account?", are we asking a question that makes sense? Can we treat the

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exchange rate as exogenous, or does it matter what causes the exchange rate to change in the first place?

These comments about models and theories and equilibrium prefigure ideas that will recur during this course many times. We can set aside these thoughts for now. Accounting is accounting, not economics, but getting the accounting facts straight is important.

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II. Exports and Imports

The balance of payments accounts record the transactions of the residents of a country with the rest of the world. The **current account** is one part of the balance of payments accounts that records a country's imports and exports of goods and services.

Some types of transactions on the current account are recorded as *debits* and some as *credits*. The debit items are the ones that involve importing some good or service. When the U.S. buys a shirt from Cambodia or heavy machinery from Germany, the value of the import is recorded as a debit.

The term debit could be confusing here. When you pay for something at the store with your debit card, there is a debit to your banking account. Something is subtracted from your banking account balance. Nothing is really subtracted from any balance when a country records a debit on its current account. Think of a debit, though, as a payment to the rest of the world, just like you pay the store with your debit card when you buy groceries.

Exports are recorded as credits. Whenever the U.S. sells something abroad, the value of that export is recorded as a credit on the current account. If we sell wheat or Boeing jets to Europe, the U.S. records a credit.

Again, we don't want to think of "credit" in exactly the sense that we use the word in everyday life. There is no fund that receives a credit when we export something, but a credit item is some transaction that generates a payment into the country.

Sometimes it is helpful to think of a balance sheet that records the debits on the left side and the credits on the right. The actual balance of payments spreadsheet that the U.S. distributes through the Bureau of Economic Analysis does not have a left hand side and a right hand side. It records the exports by different categories (more on this below) and then the imports. Visually, the balance sheet might be helpful:

Debits	Credits
Import of shirt from Cambodia \$10	Export of bushel of wheat \$5
Import of machine from Germany \$320,000	Export of Boeing jet \$57,000,000
Total debits \$320,010	Total credits \$57,000,005

This table displays the debits and credits for a country that imports one shirt and one machine, and exports one bushel of wheat and one Boeing jet. By convention, debits are recorded on the left side of the balance sheet, and credits on the right.

We can add all of the debits to get the total value of our imports, and the sum of all the credits is the total value of exports.

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The *current account balance* is the difference between the total credits and the total debits. For this country, the current account balance equals $\$57,000,005 - \$320,010 = \$56,679,995$. Because the credits exceed the debits, we say this country has a current account *surplus*. If the debits exceed the credits, the country has a current account *deficit*. If credits and debits happen to be equal exactly, the current account is in balance. We will emphasize throughout the class that there is nothing necessarily bad about a deficit or good about a surplus. For that matter, there is nothing necessarily good about a deficit or bad about a surplus. Having the current account in balance should not necessarily be an aim of policy either. This will become clear when we begin to look at economic models.

What things are included as debits?

When a country *imports a good*, it is counted as a debit on the current account. That is true of all goods that are imported. It doesn't have to be a consumer good. As in our example above, the import could be a machine or a computer or a locomotive – any capital good import is still recorded as a debit.

The import doesn't have to be a final good to be counted as a debit. Intermediate goods and raw materials imports still count as debits. China is a big importer of intermediate goods and raw materials. It might import steel from the U.S. or Japan, and it might import oil from Saudi Arabia and coal from Australia. The steel is an intermediate good that might go into the production of some final product that is either consumed within China, or used to build a building or bridge within China, or used to produce a product that is re-exported to the U.S. or Japan. None of that matters. When the steel is imported, its value is recorded as a debit in China. Likewise, the oil or coal might be sold as a final good to a household that uses the fuel to heat its house, or it might be sold to a business that uses the fuel to fire a furnace that produces some product. Again, it doesn't matter. When the coal or oil is imported, its value is recorded as a debit.

It doesn't matter who imports the good. It could be a household, it could be a business, it could be the government. In all cases, the import is recorded as a debit.

There is one minor exception, and that pertains to gold. If a household imports gold, or a business imports gold, its value is recorded as a debit on the current account. Generally, if the government imports gold, its value is also recorded as a debit on the current account. For historical reasons, as we will explain later, if the central bank of a country imports gold, it is not recorded as a debit on the current account. It does get recorded in this case as a debit on the balance of payments accounts, but in a different spot that we will describe in the next section.

It is not just imports of goods that are recorded as debits. If a country *imports a service*, that is also a debit. How can a country import a service? Our first inclination

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might be to think of a service as a haircut or housecleaning, but those are not the important services that get included in the current account. Here are some examples of service imports:

- A country may pay for legal, financial or accounting services performed by another country. For example, if a Canadian corporation hires a U.S. accounting firm, the value of that accounting service (the amount that the Canadian company pays) is recorded as a debit on the Canadian current account.

- Suppose a theater in France wants to show a Hollywood movie. They must pay the Hollywood studio for the right to show that movie. The physical movie might not be shipped from the U.S., but the payment to the Hollywood studio is an import by France, and is recorded as a debit on the French current account.

- Tourism is a major service item recorded on the current account. When an American visits Greece, and rents a hotel room and drinks ouzo at a Greek bar or eats seafood at a Greek restaurant, the American is importing a Greek service. All of those payments out to the Greeks are recorded as debits on the U.S. current account. It is as if the American has imported a sensory experience from Greece – the experience of visiting a beautiful ancient site, the experience of eating great food, or the experience of drinking too much bad liquor.

This is the trickiest of the items that is recorded as a debit on the current account: when a foreigner earns *income on an investment* in a country, the income is recorded as a debit on that country's current account. For example, if a German owns shares in Google, which is a company that is incorporated in the U.S., then when Google pays a dividend (when it distributes some of its profits), the payment out of the U.S. is recorded as a debit on the U.S. current account. This example is not referring to the transaction where the German buys the shares of Google stock. That is a different transaction and does not get recorded on the current account. We will say more about that transaction below, but the income earned in the U.S. from an asset the German previously bought is recorded as a debit on the U.S. current account.

Why is the payment of dividends to a German like an import of a service by an American? As we have already said, a payment out of the country is recorded as a debit. In this case, it really is a payment to the German for a service. What service? You can think of it as the service provided to Google of the German's capital. When an American hires a German lawyer to provide legal advice, we have seen that the payment to the lawyer for that service is recorded as a debit. When a German lends money to Google or buys part ownership of Google, the German is also providing a service to Google. It is providing funds that can be used by Google for various purposes when Google needs more money at hand than is currently being generated by its sales. Google is willing to

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pay for the service that this money provides. If the funds came in the form of a loan, it will pay interest to the German. If the funds came in the form of purchase of part ownership of Google, the payment comes when the German receives part of the profits that Google distributes.

Here's another way to think about it. Suppose that a Cambodian owned a box that could produce shirts. The box is quite remarkable – it can produce shirts if somebody just pushes a button. It doesn't require any inputs and doesn't require any real labor to run it (not counting the small effort of pushing a button!) If the shirt box were located in Cambodia, when Americans import the shirts it records a debit on the U.S. current account. What if the shirt box were set up in Los Angeles, but it was still owned by the Cambodian? We wouldn't be importing shirts from Cambodia, since they are made right in the U.S. But we would still pay the Cambodian for the shirts, since he owns the shirt box. How would those payments be recorded? In this case, the shirt box could be thought of as a business that is set up in Los Angeles by the Cambodian resident. The payment for the shirts would be the dividends (the profits) from that business. It makes sense that whether the shirt box is physically located in Cambodia or in the U.S. that the payment for the shirts by Americans to Cambodians should be recorded in similar ways on the current account balance. Indeed, they are. When the shirts are shipped from Cambodia, the payment is recorded as an import of goods, a debit on the current account. When the shirt box is in Los Angeles, the payment is recorded as "income payments" to foreigners, but is still recorded as a debit on the current account.

It is interesting to note that the national income accounts, which we discuss later, do treat these two cases differently. If the shirt box is set up in Cambodia, the value of its output is not recorded as part of the U.S. gross domestic product (GDP), but if it is in Los Angeles its output is part of U.S. GDP. However, wherever the box is located, if it is entirely owned by a Cambodian, the value of its output does not count as part of U.S. gross national product (GNP). We will see the distinction later in this chapter when we turn to national income accounts.

These income payments include interest paid to foreigners on loans. These may be loans by the foreigner to households, corporations or to the government. It does not matter who makes the loan – foreign households, firms or governments. In all cases, the interest payments are counted as debits on the current account. Also included are dividend payments to foreigners who own shares in a domestic corporation. Profits earned on foreign direct investment are also included as debits. If an American investor owns a cheese shop in Italy, which is a direct investment in Italy by the American, the profits repatriated to the American are counted as a debit on the Italian current account.

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What things are included as credits?

Everything that we discussed as being a debit for one country above is a credit for the other country. Every item that is imported into one country is an export from another country.

Exports include sales of goods to other countries, and they also include sales of services. When the Canadian buys U.S. accounting services, there is a credit recorded on the U.S. current account. When the Hollywood studio leases the movie to the French movie theater, there is a credit on the U.S. current account. If a Brazilian visits Miami and spends money on hotel services, restaurants meals and drinks, there is a credit on the U.S. current account. All of these are exports of services by the U.S.

When an American earns income from a foreign investment, the U.S. current account records a credit. You can think of this as a payment by the foreigner for the service provided by the American's money. Interest and dividends earned by Americans are credits on the U.S. current account. The profits that the American earns in Italy from his cheese shop are recorded as a credit on the U.S. current account.

Exports, imports, net foreign income

This chapter has tried to convince you that the income received from foreign investments, or paid to foreigners for their investments in your country should be treated like any other export or import. They are payments for services. In practice, it is often convenient to separate out those payments from other imports and exports. The U.S. balance of payments accounts do record them separately. The spreadsheet starts with exports of goods and services, for example. It breaks down exports into sales of goods, and payments for different types of services. Then it moves on to income received from foreign investments as a separate category. It does not include those payments under services – even though conceptually that is exactly what they are. Instead it calls them “income receipts”.

We will do the same here. In our models, we will sometimes use the notation *EX* to represent the value of a country's exports of goods and services, but not including the income received from foreign investments. *IM* refers to the imports of goods and services, but does not include the income paid out to foreigners on their investments in the U.S. Then we will use *NFI* to stand for net foreign income – the value of the credits on the current account from income Americans receive on foreign investments minus the debits on the current account for investment income paid to foreigners. Then, if *CA* stands for the current account, we have:

$$CA = EX - IM + NFI$$

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Here is an extended example of a balance of payments spreadsheet that includes services and income payments:

Debits	Credits
Imports of Goods and Services	Exports of Goods and Services
Import of shirt from Cambodia \$10 Import of machine from Germany \$320,000 Purchase of tourism services \$12,000,000	Export of bushel of wheat \$5 Export of Boeing jet \$57,000,000 Royalties on Hollywood movie \$1,000,000
Income payments to Foreigners	Income receipts from Foreigners
Interest paid on foreign loan \$32,000,000 Dividends earned by foreigner \$8,000,000	Profits earned on direct investment in foreign country \$9,000,000
Total debits \$52,320,010	Total credits \$67,000,005

The current account balance of this country is $\$67,000,005 - \$52,320,010 = \$14,679,995$. This country runs a current account surplus.

One last item recorded on the current account

There is one more transaction recorded on the current account that we have not discussed. This is the most confusing item, but also the least important. It is very unimportant for the U.S. and none of our economic models will include it. However, it actually is an important item for some countries such as Mexico. This item is *transfers* – gifts from residents of one country to residents of another.

Suppose an American gives \$1,000 to her poor uncle in Switzerland. That is a payment out, so it seems like it should be recorded as a debit, just like the payment out for goods and services, and, in fact, that is how it is recorded. It seems a little weird, because this gift is treated like an import. How is it an import? What does the American have to show for her payment?

A moment's thought leads one to conclude that the gift is not so different than the payment for other services. What is the American left with after she travels to Greece and pays for a nice dinner and some drinks? Mostly, she has the memories of the experience. Perhaps it is a warm glow from her recollection of the fine dinner and good times in Athens. She might get a similar warm glow from sending \$1,000 to her poor uncle in Switzerland. She knows she has helped the old man out, since he has been unemployed ever since he had to shut down his cheese shop in Italy because of American competition. So we can think of the gift as an import of the love and affection of the American's uncle in Switzerland.

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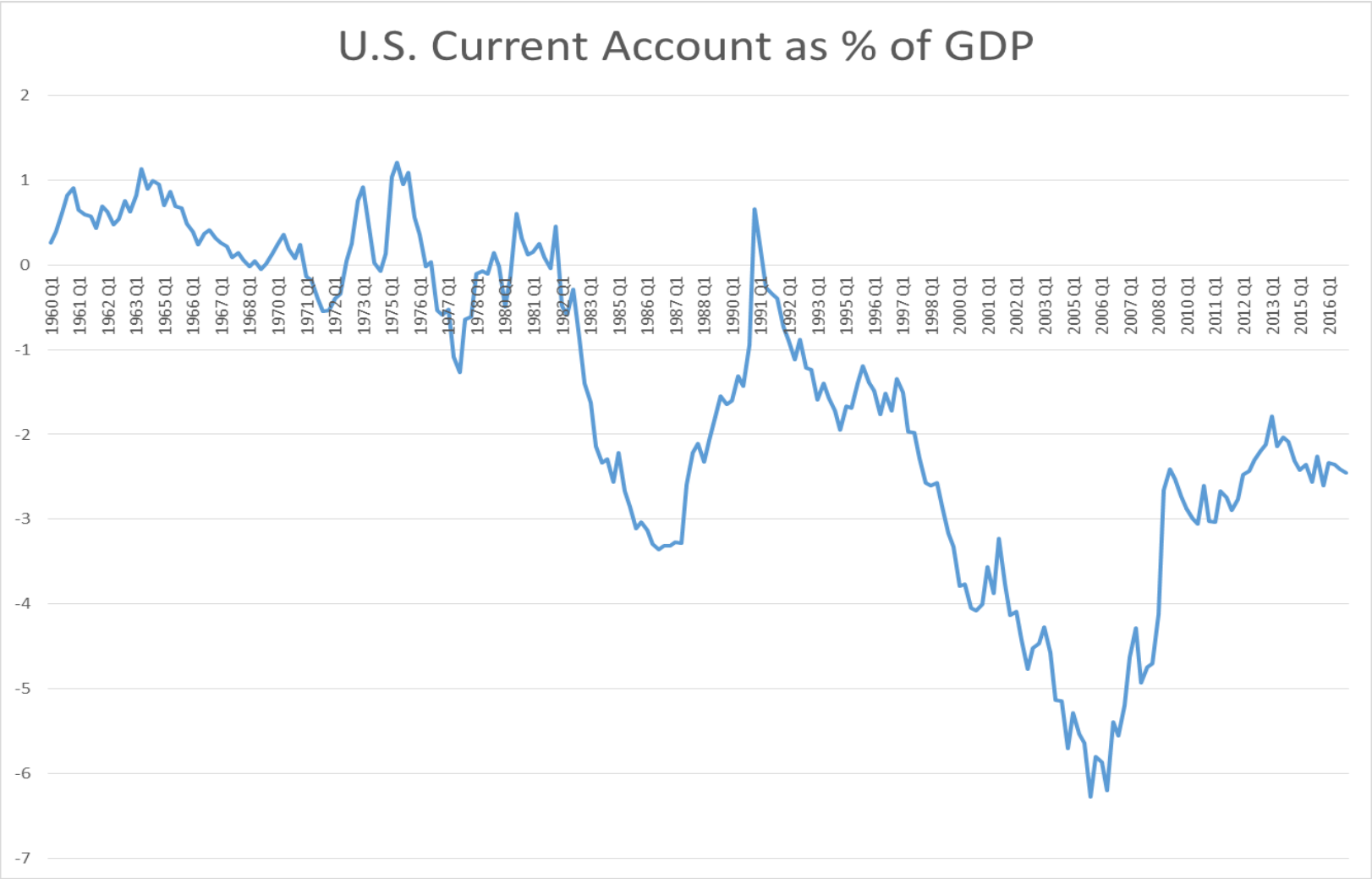
II. Exports and Imports

When an American receives a gift, it is recorded as a credit item on the U.S. current account. Government gifts are recorded in this way as well. Aid by the U.S. to Africa to help fight disease and starvation is recorded as a debit on the U.S. current account, but should be counted as a credit on the current account of the recipient African country.

These gifts are called “unilateral transfers” on the official accounts. Unilateral means one-sided. It is an acknowledgment that the person making the transfer gets nothing tangible in return. But sometimes the best things are not tangible, and so it is helpful to think of these entries as payment for some sort of good feeling imported from abroad.

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II. Exports and Imports

Here is a look at the U.S. current account since 1960, as a percentage of U.S. GDP:



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II. Exports and Imports

Looking at this chart, it is clear that the U.S. current account fell into a very large deficit from some time in 1991 through the present time. The deficit grew as a percentage of GDP pretty much continuously until the global financial crisis struck around 2007. The deficit fell (the current account balance rose) as the U.S. fell into recession, though it has never reached balance or returned to surplus.

It is interesting that the last time the U.S. current account was in surplus was briefly in early 1991. The balance was near zero anyway, but it was actually a unilateral transfer into the U.S. that put the balance over the top into surplus in the first quarter of 1991. That was when Japan made a large transfer to the U.S. The U.S. had gathered support in various forms from a number of governments around the world to fight the Gulf War. This was the war that the U.S. entered to help drive Iraq out of Kuwait, which Iraq had invaded without provocation. Many countries sent troops in support of the war effort, but Japan is constrained by its constitution to use its armed forces only in defense. However, Japan wished to show its support for the U.S. and agreed to make a payment to help defray the large costs of the war effort.

When we turn to the national income accounts, we will again look at the behavior of the U.S. current account since 1991 and see if we can learn anything from the accounts alone on what has led to this large deficit.

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III. Double Entry Accounting and the Financial Account

Suppose the U.S. exports two bushels of wheat to Cambodia in exchange for one shirt. How is this recorded in the balance of payments accounts? First, let's translate these items into units of account that are comparable. This trade might occur if one bushel of wheat is worth \$5 and one shirt costs \$10. This transaction involves both an export and an import, or, a credit and a debit. The export/credit is the two bushels of wheat, for \$10. The import/debit is the shirt that costs \$10. On the current account balance we would see:

Debits	Credits
Import of shirt from Cambodia \$10	Export of 2 bushels of wheat \$10
Total debits \$10	Total credits \$10

This country's total debits equal its total credits. Doesn't that have to be true, though? If a country exports something, doesn't it get something of equal value in return? Shouldn't we always have debits equal to credits? We might not always trade one good directly for another good, but we always send something to a foreign country in return for something of equal value. If the American had sent the two bushels of wheat to Cambodia and gotten 10 dollars in return, it still would have been an equal trade – 2 bushels of wheat, worth \$10, are exchanged for \$10. Or if the American had sent \$10 to Cambodia for a shirt worth \$10, there would be an equal exchange.

[Maybe there is an exception when a country makes a gift to a foreigner, but gifts are a small part of our international transactions. Besides, we have already seen that under the accounting conventions, when somebody gives \$1,000 to their poor uncle in Switzerland, we record an import of \$1,000 worth of love and affection in return for the \$1,000 sent overseas.]

There is not much difference between the case in which the U.S. sends two bushels of wheat to Cambodia and gets one shirt worth \$10, and when it sends the wheat and gets \$10 instead. It seems like in the second case, there ought to be some way to record a debit for the "import" of the ten dollars, and indeed there is. There is another part of the balance of payments accounts that we have not yet touched on, traditionally called the "financial account" by the U.S. and many other countries. (Traditionally until maybe twenty years ago, this was referred to as the "capital account". In the U.S. balance of payments statistics, confusingly, there is something called the "capital account" which is extremely minor and something entirely different than the financial account.)

The financial account records trade in assets. Assets are property of value such as cash, bonds, equity shares, land ownership, etc. When we trade a consumption good (or service) and acquire an asset, we are really acquiring a claim to future consumption. Assets themselves do not give us pleasure (well, maybe we like seeing stacks of money

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III. Double Entry Accounting and the Financial Account

on our desk, but let's ignore that type of pleasure.) The reason we acquire assets is that we hope to trade them in the future for some consumption good or service.

Most international trade in goods does not involve swapping one good for another good, but instead involves trading a good for an asset. Typically an importer might pay by making a bank transfer to the exporter. The exporter acquires an asset – a deposit in its bank. We can think of the importer of the good as being an exporter of an asset.

Suppose a country has the following five trades:

- (1) Exports \$10,000 wheat, receives a \$10,000 bank deposit.
- (2) Imports \$50,000 machine, pays with a \$50,000 bank deposit.
- (3) The country's residents make some trips abroad and spend \$12,000, paying in cash.
- (4) Country receives a \$40,000 bank deposit as royalties for licensing one of its movies abroad.
- (5) A citizen receives \$5,000 in cash from a rich aunt in Hong Kong.
- (6) An American receives a deposit of \$8,000 as interest from a U.K. government bond.

Here is the country's balance of payments:

Debits	Credits
Current Account	
(2) machine \$50,000 (3) tourism \$12,000	(1) wheat \$10,000 (4) royalties \$40,000 (5) unilateral transfer \$5,000 (6) income from bond \$8,000
Financial Account	
(1) bank deposit \$10,000 (4) bank deposit \$40,000 (5) cash \$5,000 (6) bank deposit \$8,000	(2) bank deposit \$50,000 (3) cash \$12,000
Total debits \$125,000	Total credits \$125,000

The total debits are equal to the total credits for this country. That must be true because every time we recorded a debit somewhere, we also recorded a credit. This style of bookkeeping is known as double-entry accounting.

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III. Double Entry Accounting and the Financial Account

This country does not have a zero current account balance. Its credits on the current account total \$63,000, while its debits total \$62,000. It has a current account surplus of \$1,000 (\$63,000-\$62,000).

The financial account balance is the sum of the credits less the sum of the debits on the financial account. Here, the credits on the financial account total \$62,000 and the debits total \$63,000, so the country's financial account deficit is \$1,000. It is no coincidence that the financial account deficit equals the current account surplus. Because the sum of all the debits must equal the sum of all the credits, the sum of the current account and financial account (which equals the sum of all the credits less the sum of all the debits) must be zero. We will use the notation FA to refer to the financial account. We must have

$$FA + CA = 0.$$

It follows that $FA = -CA$. Here, $CA = \$1,000$, so $FA = -CA = -\$1,000$.

In the previous section, we broke up the current account in to subsections – goods and services in one section, income payments in a second. We could have added unilateral transfers as a third section, as in the U.S. official accounts. If we do that for the example above, a more detailed table for our balance of payments would look like this:

Debits	Credits
Current Account	
Imports of Goods and Services	Exports of Goods and Services
(2) machine \$50,000	(1) wheat \$10,000
(3) tourism \$12,000	(4) royalties \$40,000
Income Payments to Foreigners	Income Payments from Foreigners
	(6) income from bond \$8,000
Unilateral Transfers to Foreigners	Unilateral Transfers from Foreigners
	(5) unilateral transfer \$5,000
Total debits on current account \$62,000	Total credits on current account \$63,000
Financial Account	
(1) bank deposit \$10,000	(2) bank deposit \$50,000
(4) bank deposit \$40,000	(3) cash \$12,000
(5) cash \$5,000	
(6) bank deposit \$8,000	
Total debits on financial account \$63,000	Total credits on financial account \$62,000
Total debits \$125,000	Total credits \$125,000

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III. Double Entry Accounting and the Financial Account

It would be wrong to conclude that the trade in goods and services is the largest component of the balance of payments. All of our examples above involve trading a current account item for a financial account item, but by far the largest category of trade is asset for asset. When an American sells a Treasury bond to a German in return for a deposit, both sides of that transaction are recorded on the financial account. The export of the Treasury bond is recorded as a credit on the U.S. financial account, and the import of deposits as a debit. The total volume of trade in assets is much larger than just the amount of current account trade. For example, the *daily* volume in foreign exchange trade in April 2016 was about \$5.1 trillion, most of which involved trade in dollars. But the sum of exports and imports in 2016 for the entire *year* in the U.S. was only around \$4.9 trillion.

Here are some additional examples of transactions:

- (7) The U.S. exports \$15,000 of wheat to Cambodia in exchange for \$15,000 of shirts.
- (8) An American buys a life insurance policy that costs \$10,000, pays by transfer to the account of the British insurance company.
- (9) An Italian buys \$33,000 of shares in Google, pays by bank transfer.
- (10) An American buys an acre of land in Canada, pays \$41,000 by bank transfer.
- (11) An American pays \$100,000 to buy a U.K. government bond by making bank transfer to U.K. government.
- (12) An American sells \$7,000 of shares in a French corporation he had previously bought to a Nigerian resident, receiving the payment as a bank deposit.
- (13) The Federal Reserve buys \$50,000 of Japanese Treasury bonds from a Japanese citizen, pays by bank transfer.

With these additions, the balance of payments accounts now become:

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Debits	Credits
Current Account	
Imports of Goods and Services	Exports of Goods and Services
(2) machine \$50,000 (3) tourism \$12,000 (7) shirts \$15,000	(1) wheat \$10,000 (4) royalties \$40,000 (7) wheat \$15,000
Income Payments to Foreigners	Income Payments from Foreigners
	(6) income from bond \$8,000
Unilateral Transfers to Foreigners	Unilateral Transfers from Foreigners
	(5) unilateral transfer \$5,000
Total debits on current account \$77,000	Total credits on current account \$78,000
Financial Account	
(1) bank deposit \$10,000 (4) bank deposit \$40,000 (5) cash \$5,000 (6) bank deposit \$8,000 (8) life insurance \$10,000 (9) bank deposit \$33,000 (10) title to land \$41,000 (11) U.K. bonds \$100,000 (12) bank deposit \$7,000 (13) Japanese bonds \$50,000	(2) bank deposit \$50,000 (3) cash \$12,000 (8) bank deposit \$10,000 (9) Shares of Google \$33,000 (10) bank deposit \$41,000 (11) bank deposit \$100,000 (12) Shares in French corporation \$7,000 (13) bank deposit \$50,000
Total debits on financial account \$304,000	Total credits on financial account \$303,000
Total debits \$381,000	Total credits \$381,000

This country has a current account surplus of \$1,000 and a financial account deficit of \$1,000. Note the difference in how the purchase of the U.K. government bond (item #11) is recorded compared to the income received on a U.K. government bond (item #6).

Also consider transaction #12. The American sells a French stock to a Nigerian. The sale of the stock is recorded as a credit on the U.S. financial account. Even though the shares are in a French company, not an American company, there is still a credit on the U.S. accounts. The location of the company doesn't matter – what matters is whether the American is selling an asset to a foreign resident.

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Statistical Discrepancy

In principle the sum of the debits equals the sum of the credits on the balance of payments. In practice, the recorded differences are sometimes large. The difference is called the statistical discrepancy in the U.S. accounts. For example, in 2016, the U.S. current account balance is recorded as -\$452 billion, or a \$452 billion deficit. The financial account is measured as \$378 billion. The difference between the current account deficit and the financial account surplus is not zero. Instead, adding the current account and financial account, we get -\$74 billion, which is the statistical discrepancy.

It is generally believed that the current account numbers are more reliable than the financial account entries. In order to record asset holdings, the government establishes reporting requirements for financial institutions – banks, mutual funds, stock brokerages, etc. These financial institutions are required to keep records of international financial transactions, so they record when an American sells or buys an asset to or from a foreigner. One reason the banks and other financial institutions must report this information is that the government may use it to check income reported on tax forms by individuals and businesses.

Not all asset trade takes place through institutions that are required to report to the government, so inevitably some asset trade is missed on the official statistics. One concern is that individuals or businesses might deliberately hide trade in assets in order to avoid taxes. For example, Mr. Cheat might take \$1 million out of his bank account in New York in cash. The New York bank does not record that as an international transaction – for all the bank and the tax authorities know, Mr. Cheat took that money and spent it on some very nice dinners. Mr. Cheat, however, really has traveled to the Grand Cayman Islands where he found a bank that would take a \$1 million cash deposit and pay interest. The bank is one that does not report its holdings to the U.S. government, and does not report the interest that it pays to Mr. Cheat. Mr. Cheat's financial account transaction goes unrecorded, as does the income that he receives on his deposits which should be recorded on the current account.

The most reliably reported item on the balance of payments statistics is the trade in goods. When a good is shipped to a foreign country, or when a good comes in from a foreign country, the value of the transaction must be reported to a customs agent. Those numbers are then reported to the agency that tabulates the current account statistics. In principle, trade in services should also be recorded in this way, though there are some omissions because while goods must physically be shipped out of the country and must pass through customs, services may not involve any physical travel.

There may be some errors, however, even in the reporting of the value of goods and services traded. For example, suppose that a multinational firm is exporting a

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product to one of its subsidiaries in another country. The tax rate on profits might be lower in the country where the subsidiary is located than in the corporation's home country. There is evidence that in a case like this, businesses might report a value for the export that is lower than the true market value. That misreporting will lower the parent firm's recorded profits, while increasing the subsidiary's profits (because recorded costs for the subsidiary are made lower by the misreporting.) That may be advantageous since the home country taxes profits at a higher rate than the foreign country.

While there are certainly many omissions from the financial account, we have noted that the current account might not be entirely accurate. Firms may misreport the value of exports or imports of goods and services in order to manipulate their tax liabilities. Tax cheats often hide income earned on foreign investments. In fact, we have one way of measuring how mismeasured current accounts tend to be. The sum of all the current accounts in the world should be zero. One country's export is another's import. One country's credit is another's debit. In 2016, the world showed a current account surplus, while in many previous years it has shown a deficit. Obviously, since the true world current account is zero, this measure simply reflects worldwide statistical discrepancy.

Overall, the current account numbers are considered to be relatively reliable, with misreporting of imports and exports thought to be only a few percent of the true total.

Asset Accumulation and the Financial Account Balance

The current account is a broad measure of the difference between receipts from a country's exports and the value of its imports. Since it is considered to be a measure of trade in goods and services, policies proposed to deal with current account imbalances are usually trade policies – tariffs, exchange rate policy, etc. We have seen that trade in goods often involves trade in assets as well. In fact, an accounting identity we have uncovered is that the current account is equal to minus the financial account. If the current account is in surplus by X dollars, the financial account must be in deficit by X dollars, and vice-versa.

The U.S. has been running a large current account deficit since the early 1990s, but that means the financial account has been in surplus. What does that mean? In each year, the value of assets sold to foreigners exceeds the value of assets bought from foreigners. If we sell an asset to a foreigner, the foreigner has a claim to some stream of income that we earn. For example, if we sell a bond to a foreigner, then we must pay interest on that bond and eventually we must repay the original loan. If the foreigner buys shares of equity in a U.S. company, she is entitled to a share of the firm's profits for as long as she holds those shares.

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The financial account balance, then, measures the difference between the increase in foreigner's claims on our country and the increase in our claims on foreigners. If we run a financial account surplus, foreigners have increased their net claims on our country, and if we have a financial account deficit, we have increased our net claims on foreign income. It may be simpler to think of things this way: If a foreigner acquires claims on our income, he is a lender to our country. If we amass claims on foreigners, we are lending abroad. Then if we run a financial account surplus, our country is a net foreign borrower, and if we run a financial account deficit, our country is a net foreign lender.

It follows that a country that has a current account deficit is a net foreign borrower, and a country with a current account surplus is a net foreign lender. The U.S. has been a net borrower from the rest of the world since the early 1990s.

We should ask policymakers whether tariff or exchange rate policies are the right policies to deal with imbalances in borrowing. It is equally valid to think of a current account imbalance as an imbalance in trade or as the country being a lender or borrower. As we proceed to the economic analysis, we will see that current account balance is not necessarily a desirable objective. Think of the analogy to your own life. There are times when it makes sense for you to be a borrower. College students often borrow to help pay their tuition. They are running a current account deficit – their income from selling their output is less than the value of their purchases (including college tuition.) It may be perfectly rational for a young person to borrow to pay for college. Their current account deficit is not a problem that requires correction. We need to be careful in deciding when a country's current account deficit is a problem that needs to be corrected. If it is, we should ask whether we are using the correct policies to reduce the country's borrowing.

An important point to note is that a country's borrowing is subtly different than the change in the value of the country's external debt, or its saving is different than the change in the value of its claims on the rest of the world. Again, let's think of an analogy to an individual. Suppose that at the beginning of 2016, my lifetime saving were all in the form of 20-year U.S. Treasury bonds. On January 1, 2016, let's say that I owned exactly \$100,000 of U.S. Treasury bonds. During the year, I saved and acquired more U.S. bonds. To make the example simple, suppose that my only saving occurred on December 31, 2016. Just as the markets were closing, I took \$10,000 that I had earned during the year and bought more Treasury bonds. I saved \$10,000 for the year. Indeed, the national income accounts (which we will look at later in this chapter) record that I saved \$10,000, but the change in my wealth may have been something different than \$10,000. U.S. Treasury bonds fluctuate in value as interest rates change. During 2016, my original \$100,000 of bonds may have gained in value, say by \$5,000. At the end of 2016, my total wealth is \$115,000: my original \$100,000 plus the \$10,000 I saved plus the increase in the value of my bonds of \$5,000.

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III. Double Entry Accounting and the Financial Account

The purpose of saving is to accumulate wealth that can be used for later consumption. A person might be saving for their retirement, or to help pay their college tuition, or to raise enough capital to start a business. For that purpose, it really doesn't matter if the increase in wealth came because of saving or because of a **valuation change**. For many economic purposes, we might want to treat those two sources of wealth change equally.

Similarly, the financial account only records the value of assets we acquire and the value of assets we sell. It does not record changes in the value of assets we hold. For example, suppose that foreigners hold U.S. Treasury bonds worth \$1 trillion at the beginning of 2016, and the U.S. holds foreign equities also worth \$1 trillion. During 2016, let's assume that the only financial account transactions that take place between the U.S. and the rest of the world are an additional sale of \$100 billion of Treasury bonds. (The U.S. imports \$100 billion of goods and pays for them with Treasury bonds.) The U.S. is clearly a net borrower during 2016. Assume, in addition, that the original \$1 trillion of debt owed by the U.S. to the rest of the world does not change in value, but the value of foreign equities owned by the U.S. increases by 15% to \$1.15 trillion. Even though the U.S. is a borrower during 2016 – it runs a current account deficit of \$0.1 trillion and borrows \$0.1 trillion – its net asset position with the rest of the world has improved. While its debt has increased to \$1.1 trillion, the value of its foreign equities has risen to \$1.15 trillion. The balance of payments statistics do not capture this valuation change. Just looking at the borrowing from the rest of the world, it appears as if the U.S. balance sheet has deteriorated. It appears that U.S. liabilities have risen relative to its assets. When valuation changes are taken into account, though, the opposite picture emerges.

One important source of valuation changes comes from exchange rate movements. We will examine exchange rates in great detail during this semester, so this mention of exchange rates is quite preliminary in our studies. However, let's suppose that the foreign assets that the U.S. holds are mainly denominated in foreign currency. For example, it might hold ten billion pounds of U.K. stocks – the pound is the British currency. The dollar value of those U.K. stocks can be calculated by multiplying the dollar per pound exchange rate by the value in pounds of the stocks. For example, if one U.K. pound costs \$1.50, then the U.S. holds \$15 billion of British equities (1.5 dollars per pound times 10 billion pounds.) If the exchange rate rises to \$1.60 per pound, the dollar value of the U.S. holdings of British stocks rises to \$16 billion.

Let's extend this example just a little further. In practice, most of the foreign holdings of claims on the U.S. are denominated in dollars. The U.S. borrows in debt denominated in dollars. However, a considerable part of the U.S. holdings of foreign assets are denominated in foreign currency. When the cost of foreign currency rises (as in the example, when the dollar price of a U.K. pound rises from \$1.50 to \$1.60), the

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dollar value of the American portfolio of claims on foreigners rises. The dollar value of U.S. debt is not affected by the exchange rate change. Then this exchange rate change works to increase the value of U.S. foreign assets relative to its liabilities. The change in the exchange rate here is a weakening of the dollar. It takes more dollars to buy a pound when the price is \$1.60 than when it is \$1.50, so the dollar has lost strength in its purchasing power over British pounds. That weakening of the dollar improves the U.S. balance sheet because it tends to increase the value of our external assets compared to our liabilities.

Accounting
IV. National Income Accounts

Next we turn to a completely different set of accounts called the **national income and product accounts**. A country's *gross domestic product* (GDP) is the value of final output produced within its borders over a particular time period. You should already be familiar with this concept from classes that you took before. *Final output* refers to the final usage of some product. It may be households or businesses that use the product, but there is a distinction between final products and intermediate goods. For example, when a country produces a television set, the final value of the t.v. is counted as GDP. The country does not count separately the parts that go into the t.v. such as the screen, the receiver, or the casing, because if they did, they would double-count the value of those inputs. However, one could measure the value of the final output either by taking the value that the television sold for, or taking the value added at each stage of production. For example, the television might sell for \$500, and that would be the t.v.'s contribution to GDP. We might alternatively measure the value added at each stage of production. The screen might have been produced by one company and sold to the t.v. manufacturer for \$100. The casing might have been made by a different company and sold to the t.v. manufacturer for \$50. The receiver could have been made by a third company and sold to the television manufacturer for \$75. Those numbers - \$100, \$50, and \$75 – represent the “value added” of each of the firms in the chain of production (the companies that produce the screen, the casing, and the receiver.) The t.v. manufacturer assembles these parts, ships them to a store, advertises and sells them for \$500. Its value added is \$275, which is the difference between the final price and the intermediate inputs (\$500-\$100-\$50-\$75). When you sum the value added of each firm, you get the \$500 contribution to GDP.

If a firm buys a computer, or an office building, or a machine, it is not buying an intermediate product. Those are capital goods – products that are used by businesses in the production of goods or services. They are not intermediate goods because they are not incorporated directly into the final product itself. The production of capital goods is included as part of GDP.

Only newly produced output is included in GDP. If somebody sells a used car or an old television or a house that was built in previous years, the sale is not part of GDP.

There is a difference between the *value of final output* produced within a country and the *value of the sales of final goods*. That difference comes because some of the value of the good embodies imported intermediate goods. Take the example given above of the television that sells for \$500. If the screen, which costs \$100, was actually manufactured abroad and imported into the country, then the total value added inside the country is only \$500-\$100. The contribution to GDP in this case is \$400. To make the distinction between the value of final sales and GDP, let's use the notation *FSales* for the value of the sales of final products produced within the country. We can use *ImInt* to stand for the value of imported intermediate goods. We have:

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$$GDP = FSales - ImInt$$

The money received from sale of a product goes as income to somebody. When a television is sold for \$500, some of that \$500 goes as profit to the t.v. manufacturer. Some goes as profit to the makers of the intermediate goods. Some goes toward paying wages to workers at the final producer and the intermediate producers. These firms might also rent land or buildings, so some of the \$500 might be paid as rent to a landlord. The value of all final output can be measured as the sum of all the income earned in producing that product. That is another way to think about GDP – it is the value of all income earned by production within the country's borders. (If \$100 of the value of the television comes from the imported intermediate good, then clearly only \$400 is going as income to residents of the country producing the final television.)

GDP and *gross national product* (GNP) are not the same thing, because GNP measures income earned by the residents of a country. The reason these are different is that residents of a country might earn income abroad. That income comes primarily from investment income earned abroad. (Labor income doesn't play a big role in income earned abroad, in part because of accounting rules for tax purposes. Suppose an American living in New York earns consulting income from a Parisian firm. The American might travel to Paris quite a bit, but because he is a resident of New York he is considered to have produced that income in New York. It is counted as part of U.S. GDP, not French GDP.) Also, some of the income produced within a country will go as investment income to foreigners. The difference between GNP and GDP is our net foreign income. That term should sound familiar to you, because we used it in referring to items on the current account. Although the balance of payments accounts and the national income accounts are tabulated separately, in principle these items should be essentially the same. That is, we should have $NFI = GNP - GDP$.

The national income and product accounts actually contain an item called national income that is not exactly the same as *GNP*. National income subtracts from GNP the value of capital depreciation. Each year, capital equipment such as buildings, machines, and computers lose value simply from usage, from wear and tear. Gross national product makes no adjustment for that capital depreciation, but national income does. Let *DEP* stand for capital depreciation, and *NI* stand for national income, we have:

$$NI = GNP - DEP = GDP + NFI - DEP$$

You should be familiar with the concept of breaking down GDP into usages. Final products are sold to households as consumption goods, to businesses as investment goods, to government, or to foreigners as exports. Actually, the national accounts include new houses as an investment good, even though they are sold to households. The U.S.

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accounts do not make a distinction between government purchases that are consumption goods and services versus investment goods, though many countries do note such a distinction. We will use C to denote consumption, I for investment, G for government spending on goods and services, and EX for exports of goods and services.

To be clear, C denotes all the consumption expenditures of the residents of a country. Consumption measured in the U.S. national income and product accounts includes all consumption spending by American residents. Likewise, I includes all investment spending by American firms (and purchases of newly-built homes by Americans), and G contains all spending on goods and services by government. These quantities include the spending on foreign goods and services – they include imports. In fact, to get total spending by domestic residents, we want to include spending on imported intermediate goods. Total spending then is given by $C + I + G + ImInt$.

If we want only spending by Americans on American goods, we must subtract off imports, IM . Our measure of imports, IM , includes the value of imported intermediate goods as well as spending on imported final goods. The amount Americans spend on final American goods and services is $C + I + G + ImInt - IM$. The amount spent by foreigners on final American goods and services is EX . We have then that the total amount spent on final U.S. goods and services is $C + I + G + ImInt + EX - IM$. (All export goods are considered to be “final” goods. Even if a firm in the foreign country is going to use it as an intermediate good, the good is not used in production in the domestic country. From the standpoint of the domestic country, it is put to its final use when it is exported.)

The total value of goods and services sold by U.S. producers is equal to GDP plus purchases of imported intermediate goods: $FSales = GDP + ImInt$. (By an accounting device, goods that are produced but not sold are counted as “inventory investment” and counted as part of I .) We have:

$$FSales = GDP + ImInt = C + I + G + ImInt + EX - IM ,$$

so we get:

$$GDP = C + I + G + EX - IM .$$

Notice that we can write also

$$GNP = GDP + NFI = C + I + G + EX - IM + NFI = C + I + G + CA .$$

Here we have used the fact that the current account balance, CA , is equal to $EX - IM + NFI$. Now let's use the term “net investment” to refer to the net additions to

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the country's capital stock. That is the new additions to the capital stock, I , less the depreciated capital, DEP . We will call this $NetI$, where

$$NetI = I - DEP.$$

Using this relationship, we can write

$$NI = GNP - DEP = C + I - DEP + G + CA = C + NetI + G + CA.$$

Rewriting, we have

$$NI - (C + NetI + G) = CA.$$

NI represents national income – the sum of all income earned by the country's residents. $C + NetI + G$ amounts to total expenditure by residents of the country (netting out capital depreciation.) The current account balance can be seen to be the difference between national income and national expenditure.

This is the third way of thinking about the current account that we have encountered. First, we saw that the current account was a broad measure of the country's *net exports*, given by $EX - IM + NFI$. Then we saw that it was equal to the country's *net accumulation of foreign assets*, given by $-FA$. Now we see that it is the *difference between a country's national income and its expenditure*. These last two notions are easy to reconcile. If a country spends less than its income, it must be lending abroad. So if $NI - (C + NetI + G) > 0$, the country must be running a financial account deficit, $FA < 0$ and acquiring claims on foreigners.

Disposable income is the amount of income available for spending by the private sector. The private, non-governmental sector cannot spend income that is taxed. However, if the private sector receives transfers from the government – income support, Social Security payments, farm support – those increase the private sector's income. Let T represent taxes net of transfers (total taxes paid less transfer payments to the private sector.) Then disposable income, DI , is given by:

$$DI = NI - T.$$

Private saving is the amount of disposable income that is not consumed. We will use the notation PS to refer to private saving:

$$PS = NI - T - C.$$

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We can also talk about “government saving”. Government can save if it does not spend all of its tax collections. $T - G$ equals taxes (net of transfer payments) minus total government expenditures, and represents government saving, GS :

$$GS = T - G .$$

Government saving is positive if the government has a budget surplus and negative if there is a budget deficit.

National saving refers to the total saving by the private sector and government. We will use the notation S to refer to national saving.

Now we can rearrange the relationship $NI - (C + NetI + G) = CA$ to get one more useful identity.

$$CA = NI - (C + NetI + G) = (NI - C - T) + (T - G) - NetI = PS + GS - NetI = S - NetI .$$

This relationship gives us our final way to think about the current account. It is equal to a country’s *national saving less its net investment*. To put it another way, think about how a country as a whole could save. It could either add to its capital stock (net investment) or it could acquire claims on foreigners (the current account). We have that national saving must equal net investment plus the current account: $S = NetI + CA$.

The measure of saving in the national income and product accounts refers to disposable income that is not spent on consumption. It does not refer to the accumulation of wealth. We previously considered the difference. A household’s wealth could increase even if it does no saving because of valuation changes. The value of its assets could increase as their prices rose. Our measure of saving does not include these valuation effects, just as the measure of accumulation of net claims on foreigners in the balance of payments accounts does not include valuation changes.

As we noted at the outset, these accounting identities tell us something. If the U.S. current account deficit is to fall, its financial account surplus must fall. Its expenditure has to fall relative to its national income. Saving must rise relative to capital accumulation. Any theory or proposal about how the current account deficit must change has to respect these accounting identities.

It is interesting to trace the evolution of the U.S. current account since 1991 (when it was last in surplus) by looking at how the components of saving have evolved over time. We can break down private saving further into personal saving and corporate

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saving. Corporate saving refers to profits earned by the corporate sector that are neither returned to shareholders as dividends nor spent on the business.

	1991	2000	2008:I	2008:II	2009:IV	2013:II	2017:I
Personal Saving/GDP	5.23	2.14	0.88	2.58	2.97	3.48	2.91
Corporate Saving/GDP	2.30	1.77	2.90	2.71	3.64	3.79	3.43
Net Investment/GDP	4.99	8.97	6.10	5.69	2.49	3.56	4.00
Budget Surplus/GDP	-3.74	2.28	-3.15	-5.67	-9.05	-5.11	-4.37
Net Foreign Lending/GDP	0.05	-4.14	-5.01	-5.21	-3.31	-2.52	-2.56
Statistical Discrepancy	-1.25	1.36	-0.46	-0.86	-1.62	1.12	0.53

This table picks out data on personal saving, corporate saving, net investment, the budget surplus (that is, government saving) and net foreign lending (the current account), along with the statistical discrepancy. The data reported include the average for the whole years of 1991 and 2000, as well as for the first and second quarters of 2008, the fourth quarter of 2009, the second quarter of 2013 and the first quarter of 2017.

For the year 1991, the U.S. current account was in surplus. It had dropped to a deficit that was 4.14% of GDP by 2000. We scale the size of the deficit by GDP because the economy is growing over time, so that the raw current account numbers might give a misleading picture as the size of the economy increases. The global financial crisis began to hit in earnest in early 2008. Officially, the U.S. dipped into recession at this point. The current account deficit in the first quarter of 2008 was up to 5.01% of GDP, and even rose to 5.21% of GDP by the second quarter of 2008. Once the crisis hit full-force and the U.S. tumbled into a deep recession, the U.S. current account deficit fell. By the end of 2009, as the worst of the crisis was finally abating, the U.S. deficit had fallen to only 3.31% of GDP. Even as the economy gradually recovered from the crisis, the current account deficit continued to get smaller, so that in the second quarter of 2013, it was 2.52% of GDP. It essentially has not changed since then.

Do these accounting numbers tell us what caused the U.S. current account deficit to rise from essentially zero in 1991 to 5% of GDP at the beginning of 2008? No. These numbers alone cannot unveil the causes of the increasing deficit, but they may give us some clues.

Let's consider the change from 1991 to 2008:I in a purely accounting way. The current account dropped by 5.06% of GDP. The budget deficit does not account for any of this. It actually fell from 3.74% of GDP in 1991 to 3.15% of GDP in 2008:I. Corporate saving also rose, from 2.30% of GDP in 1991 to 2.90% in 2008:I, so it also can account for none of the decline in the current account balance. If we measured the

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current account by national saving minus net investment, it would have been -1.20% of GDP in 1991 and -5.47% of GDP in early 2008, so the decline would have been only 3.27% of GDP. That is, there is a statistical discrepancy of 0.79% between the decline in the current account measured directly (5.06% of GDP) and the indirect measure (3.27% of GDP). Another force that accounts for a modest portion of the declining current account is the increase in investment. Net investment accounted for 4.99% of GDP in 1991 but rose to 6.10 percent in 2008:I, so that category is responsible for 1.11 percentage points of the 5.06 percentage point increase in the current account. Clearly the biggest change comes in the personal saving category. Personal saving fell from 5.23% of GDP in 1991 to 0.88% of GDP in 2008:I. That category alone accounts for 4.35 percentage points of the 5.06 percentage point decline in the current account.

Some commentators blame the government budget deficit for the decline in the U.S. current account. Is that right? In a purely accounting sense, the answer is clearly no. The budget deficit fell, not rose, from 1991 to early 2008. Still, that is the accounting, not the economics. In 1991, the U.S. was in a recession. The government budget deficit naturally rises in a recession. Income tax and corporate tax collections fall, not because tax rates are cut but because income and corporate profits decline in a recession. Government transfers in the form of unemployment benefits, income assistance, etc., automatically rise. In addition, fiscal policy usually proactively responds to a recession by cutting tax rates and increasing discretionary spending. Sometimes economists speak of the “cyclically adjusted” budget deficit. That measure attempts to adjust the size of the deficit by the typical fluctuations that occur over the business cycle. By those measures, the budget deficit of 1991 was not out of line with what we might expect during a recession. On the other hand, the economy was near its peak at the beginning of 2008. The budget deficit should be much smaller than average at this point of the business cycle. The cyclically adjusted budget deficit of early 2008 is certainly large by most measures. In other words, once we adjust for the phase of the business cycle, there was an increase in the government budget deficit from 1991 to 2008, perhaps even a large increase.

One way to get some sense of this issue is to look at 2000. The economy in the year 2000 was also at the peak of the business cycle. In that year, government ran a surplus of 2.28 percent of GDP, as compared to a deficit in 2008:I of 3.15 percent of GDP. There was a decline in government saving equal to 5.43% of GDP between 2000 and 2008:I.

What makes things even more difficult to understand is that the U.S. current account actually did not worsen very much between 2000 and the beginning of 2008. It increased from 4.14% of GDP to 5.01% of GDP. What was going on between 2000 and the beginning of 2008? We have seen that the government budget deficit increased a great deal. Personal saving also fell substantially, from 2.14% of GDP to 0.88% of GDP.

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With those two factors in play, why didn't the current account decline much more rapidly?

Part of the answer is that maybe it did, but the statistical discrepancy masks the change. We don't know which of the categories – personal saving, corporate saving, government saving, investment, or the current account – is measured with the most error. If we measure the current account imbalance indirectly as national saving less national investment, it fell from 2.78% of GDP in 2000 to 5.47% of GDP in 2008:I. That represents a 2.69% of GDP decline in the current account, as compared to a 0.77% measured directly.

The biggest reason why the current account did not decline much more sharply between 2000 and 2008:I, despite a large deterioration in the government budget and a fairly sharp drop in personal saving is the behavior of the corporate sector. In essence, businesses redirected earnings away from investment in new buildings, machines, and other capital goods, and instead saved their profits. The U.S. was still riding an investment boom in 2000 – net investment was 8.97% of GDP, but it fell to 6.10% of GDP by early 2008. On the other hand, corporate saving rose from 1.77% of GDP to 2.90% of GDP. These two factors work toward increasing the U.S. current account by 4.00% of GDP.

The overall picture on the contribution of the government budget deficit to the decline in the U.S. current account balance from 1991 to early 2008 is murky. A direct look at the statistics seems to say that the budget situation was not at all responsible, because the budget deficit actually fell over this period. However, the cyclically adjusted budget deficit did rise, and there was a large increase in the budget deficit from 2000 to 2008:I. An understanding of the contribution of the budget deficit to the deterioration of the U.S. current account requires more than just a cursory look at the accounting. We need an economic model and some serious statistical analysis. This course will provide some models, but you must look elsewhere for the econometric study of this issue.

It does seem clear that the decline in personal saving played some role. There was an enormous drop from 1991 to early 2008. At least part of that drop may be understood by realizing that Americans enjoyed a rapid increase in their wealth over this period, even with dwindling saving rates. The difference can be attributed to valuation changes. Housing values rose tremendously and the value of many other assets held by American households also rose sharply over this period. For example, even middle-income households have a stake in U.S. firms through the equity holdings of their retirement funds. As the U.S. stock market boomed, the wealth of Americans rose quickly. Because housing values and stock values increased, households probably saw little reason to save much of their income.

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It is interesting that personal saving rose sharply even in early 2008. The worst of the crisis did not hit until the very end of the third quarter and the fourth quarter of 2008, but housing values had begun to fall even before 2008. As housing values fell, personal saving rose sharply from 0.88% of GDP in the first quarter of 2008 to 2.58% in the second quarter. The decline in housing values was not the only factor that led to increased saving. Some of that increase is attributable to the tax rebate many households received in the second quarter of 2008. Although the macroeconomic purpose of the rebate was to stimulate spending, clearly some of it was saved. Still, by the end of 2009, we see that total personal saving had risen to as high as 2.97% of GDP.

The most striking aspect of these numbers is the steep rise in the government budget deficit from 2008:I to the end of 2009, from 3.15% of GDP to 9.05%. As these numbers show, there was a steep increase just going from the first to the second quarter of 2008 coming from the first stimulus plan – the tax cut just mentioned. When the economy crashed in late 2008, there was a host of further fiscal stimuli. There was another round of tax cuts, and there was stimulus spending on “shovel ready” projects. These numbers also reflect the “bailout” to the financial sector. The bailout has actually turned out to be a temporary loan to banks and non-bank financial institutions that has been largely repaid.

One might think that the U.S. current account would suffer a sharp deterioration as the government budget deficit fell from 3.15% of GDP in 2008:I to 9.05% of GDP in 2009:IV. We have already seen that this drop in government saving was partly offset by a 2.09% of GDP increase in personal saving. That is only a small offset to the 5.90% of GDP decline in government saving. Surprisingly, when we look at the numbers, the current account actually rose by 1.70% of GDP over this period (from a deficit that was 5.01% of GDP to one that was only 3.31% of GDP.) What else changed?

First, there was a steep decline in net investment, as is very typical during recessions. Net investment fell from 6.10% of GDP to 2.49% of GDP. Also, corporate saving rose. On the one hand, corporate income fell during the recession, but corporations held on to a much larger share of their profits, so overall corporate saving rose from 2.90 to 3.64% of GDP. And, unfortunately, 1.16% of GDP is a mystery – it is the change in the statistical discrepancy.

What happened in the period from the end of 2009 to the middle of 2013? According to the numbers, the current account balance continued to “improve” – from a deficit of 3.31 percent of GDP to 2.52 percent, which is an increase of 0.79 percent. There was a slight rise in private saving over this period: 0.76 percent if we look at the combined effects of personal and corporate saving. On the other hand, investment rose by 1.07 percent of GDP. However, government saving rose by a whopping 3.94 percent of GDP (from -9.05 to -5.11 percent of GDP.) If we just look at national saving less

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investment, the increase is large: $0.76 + 3.94 - 1.07 = 3.63\%$ of GDP. Why does the net foreign lending show an increase of only 0.79 percent of GDP? Unfortunately, the statistical discrepancy accounts for a lot here – it rises from -1.62 to +1.12 percent of GDP, and so again we cannot be sure enough about the numbers to know definitively what happened over this period.

Finally, we can ask about the changes between 2013:II and 2017:1. National saving was practically unchanged. Private saving – the sum of household saving and corporate saving – fell by 0.93% of GDP. But government saving rose, from -5.11% of GDP to -4.37% of GDP, an increase of 0.74% of GDP. Therefore the total change in national saving was a small drop of 0.19% of GDP. Investment also fell, by 0.74% of GDP. Since investment fell more than national saving, we might expect to see an increase in the current account – in net lending abroad, but in fact that shows a very small decrease. The explanation here is that the statistical discrepancy shrunk by 0.59% of GDP. The overall picture is that there has been a slight decline in investment in the past four years. Private saving has fallen, but government saving has increased. Overall, the net effect on the current account has been small.

These accounting numbers are provocative, but they do not tell us what causes what. We need economic models, and that is what we will get in this course.