CHAPTER 1

Introduction to the Other Half of Macroeconomics

The discipline of macroeconomics, which was founded in the late 1940s and was based on the assumption that the private sector always seeks to maximize profits, considered in its short history only one of the two phases an actual economy experiences. The largely overlooked other phase, in which the private sector may instead seek to minimize debt, can help explain why economies undergo extended periods of stagnation and why the much-touted policies of quantitative easing and zero or even negative interest rates have failed to produce the expected results. With sluggish economic and wage growth becoming a pressing issue in many developed countries, it is time for economists to leave their comfort zones and honestly confront the other half of macroeconomics.

The failure of the vast majority of economists in government, academia, and the private sector to predict either the post-2008 Great Recession or the degree of its severity has raised serious credibility issues for the profession. The widely varying opinions of these "experts" on how this recession should be addressed, together with the repeated failures of central banks and other policymakers to meet inflation or growth targets in spite of truly astronomical levels of monetary accommodation, have left the public rightfully suspicious of the establishment and its economists.

This book seeks to elucidate what was missing in economics all along and what changes are needed to make the profession relevant to the economic challenges of today. Once the other half of macroeconomics is understood both as a post-bubble phenomenon and as a phase of post-industrial economies, it should be possible for policymakers to devise appropriate measures to overcome the difficulties faced by advanced countries today, including stagnation and deflation.

Human progress is said to have started when civilizations sprang up in China, Egypt, and Mesopotamia over 5,000 years ago. The Renaissance,

which began in Europe in the 13th century, accelerated the search for both a better understanding of the physical world and better forms of government. But for centuries that progress benefited only the fortunate few who had enough to eat and the leisure to ponder worldly affairs. Life for the masses was little better in the 18th century than it was in the 13th century when the Renaissance began. Thomas Piketty noted in his book *Capital in the 21st Century* that economic growth was basically at a standstill during this period, averaging only 0.1 percent per year¹.

Today, on the other hand, economic growth is largely taken for granted, and most economists only talk about "getting back to trend" without asking how the trend was established in the first place. To understand how we got from centuries of economic stagnation to where we are today, with economic growth taken for granted, we need to review certain basic facts about the economy and how it operates.

Basic Macroeconomics: One Person's Expenditure Is Another Person's Income

One person's expenditure is another person's income. It is this unalterable linkage between the expenditures and incomes of millions of thinking and reacting households and businesses that makes the study of the economy both an interesting and a unique undertaking. It is interesting because the interaction between thinking and reacting households and businesses creates a situation where one plus one does not necessarily equal two. For example, if A decides to buy less from B in order to set aside more savings for an uncertain future, B will have less income to buy things from A. That will lower A's income, which in turn will reduce the amount A can save.

This interaction between expenditure and income also means that, at the national level, if one group is saving money, another group must be doing the opposite—"dis-saving"—to keep the economy running. In most cases, this dis-saving takes the form of borrowing by businesses that seek to expand their operations. If everyone is saving and no one is dis-saving on borrowing, all of those savings will leak out of the economy's income stream, resulting in less income for all.

For example, if a person with an income of \$1,000 decides to spend \$900 and save \$100, the \$900 that is spent becomes someone else's income and continues circulating in the economy. The \$100 that is saved is typically deposited with a financial institution such as a bank, which then lends it

¹Piketty, Thomas (2014) *Capital in the Twenty-First Century*, Cambridge, MA: Harvard University Press.

to someone else who can make use of it. When that person borrows and spends the \$100, total expenditures in the economy amount to \$900 plus \$100, which is equal to the original income of \$1,000, and the economy moves forward.

In a normal economy, this function of matching savers and borrowers is performed by the financial sector, with interest rates moving higher or lower depending on whether there are too many or too few borrowers. If there are too many, interest rates will rise and some will drop out. If there are too few, interest rates will fall and prompt potential borrowers who stayed on the sidelines to step forward.

The government also has two types of policy, known as monetary and fiscal policy, that it can use to help stabilize the economy by matching private-sector savings and borrowings. The more frequently used is monetary policy, which involves raising or lowering interest rates to assist the matching process. Since an excess of borrowers is usually associated with a strong economy, a higher policy rate might be appropriate to prevent overheating and inflation. Similarly, a shortage of borrowers is usually associated with a weak economy, in which case a lower policy rate might be needed to avert a recession or deflation.

With fiscal policy, the government itself borrows and spends money on such projects as highways, airports, and other social infrastructure. While monetary policy decisions can be made very quickly by the central bank governor and his or her associates, fiscal policy tends to be very cumbersome in a peacetime democracy because elected representatives must come to an agreement on how much to borrow and where to spend the money. Because of the political nature of these decisions and the time it takes to implement them, most recent economic fluctuations were dealt with by central banks using monetary policy.

Two Reasons for Disappearance of Borrowers

Now that we have covered the basics, consider an economy in which everyone wants to save but no one wants to borrow, even at near-zero interest rates. There are at least two sets of circumstances where such a situation might arise.

The first is one in which private-sector businesses cannot find investment opportunities that will pay for themselves. The private sector will only borrow money if it believes it can pay back the debt with interest. And there is no guarantee that such opportunities will always be available. Indeed, the emergence of such opportunities depends very much on scientific discoveries and technological innovations, both of which are highly irregular and difficult to predict. In open economies, businesses may also find that overseas investment opportunities are more attractive than those available at home. If the return on capital is higher in emerging markets, for example, pressure from shareholders will force businesses to invest more abroad while reducing borrowings and investments at home. In modern globalized economies, this pressure from shareholders to invest where the return on capital is highest may play a greater role than any technological breakthroughs, or lack thereof, in the decision as to whether to borrow and invest at home.

In the second set of circumstances, private-sector borrowers have sustained huge losses and are forced to rebuild savings or pay down debt to restore their financial health. Such a situation may arise following the collapse of a nationwide asset price bubble in which a substantial part of the private sector participated with borrowed money. The collapse of the bubble leaves borrowers with huge liabilities but no assets to show for the debt. Facing a huge debt overhang, these borrowers have no choice but to pay down debt or increase savings in order to restore their balance sheets, regardless of the level of interest rates.

Even when the economy is doing well, there will always be businesses that experience financial difficulties or go bankrupt because of poor business decisions. But the number of such businesses explodes after a nationwide asset bubble bursts.

For businesses, negative equity or insolvency implies the potential loss of access to all forms of financing, including trade credit. In the worst case, all transactions must be settled in cash, since no supplier or creditor wants to extend credit to an entity that may seek bankruptcy protection at any time. Many banks and other depository institutions are also prohibited by government regulations from extending or rolling over loans to insolvent borrowers in order to safeguard depositors' money. For households, negative equity means savings they thought they had for retirement or a rainy day are no longer there. Both businesses and households will respond to these life-threatening conditions by focusing on restoring their financial health—*regardless of the level of interest rates*—until their survival is no longer at stake.

What happens when borrowers disappear for either or both of the above reasons? If there are no borrowers for the \$100 in savings in the above example, even at zero interest rates, total expenditures in the economy will drop to \$900, while the saved \$100 remains unborrowed in financial institutions or under mattresses. The economy has effectively shrunk by 10 percent, from \$1,000 to \$900. That \$900 now becomes someone else's income. If that person decides to save 10 percent and there are still no borrowers, only \$810 will be spent, causing the economy to contract to \$810. This cycle

will repeat, and the economy will shrink to \$730, if borrowers remain on the sidelines. This process of contraction is called a "deflationary spiral."

The \$100 that remains in the financial sector could still be invested in various asset classes. It could even create mini-bubbles in certain asset classes from time to time. But without borrowers in the real economy, it will never be able to leave the financial sector and support transactions that add to GDP (changes in ownership of assets do not add to GDP).

The deflationary process described above does not continue forever, since the savings-driven leakages from the income stream end once people become too poor to save. For example, if a person cannot save any money on an income of \$500, the entire \$500 will naturally be spent. If the person who receives that \$500 as income is in the same situation, she will also spend the entire amount. The result is that the economy finally stabilizes at \$500, in what we typically call a depression.

Paradox of Thrift as Fallacy-of-Composition Problem

Keynes had a name for this state of affairs, in which everyone wants to save but is unable to do so because no one is borrowing. He called it the paradox of thrift. It is a paradox because if everyone tries to save, the net result is that no one can save.

The phenomenon of right behavior at the individual level leading to a bad result collectively is known as the "fallacy of composition." An example would be a farmer who strives to increase his income by planting more crops. If all farmers do the same, and their combined efforts result in a bumper crop, crop prices will fall, and the farmers will end up with far less income than they originally expected.

The paradox of thrift is one such fallacy-of-composition problem, but macroeconomics is full of such examples. Indeed, the *real* reason to study macroeconomics as opposed to microeconomics or business administration is to be able to identify (counter-intuitive) fallacy-of-composition problems such as paradox of thrift so as to avoid their pitfalls.

Put differently, if one plus one is always equal to two, one only needs to add up the actions of individual households and businesses to obtain an aggregate result. But when interactions and feedback among the various actors cause fallacy-of-composition problems, one plus one does not always equal two, and that is where the discipline of macroeconomics (as opposed to the simple aggregation of microeconomic results) has a role to play. In that sense, macroeconomics can be considered a "science of interaction," whereas microeconomics takes the outside world as a given. Indeed, before Keynes came up with the concept of aggregate demand, most people thought that one plus one always equaled two, and there was no macroeconomics. These fallacy-of-composition problems become particularly acute when the economy is in what might be called "the other half of macroeconomics," i.e., when borrowers disappear because of balance sheet problems or a lack of domestic investment opportunities.

Disappearance of Borrowers Finally Recognized After 2008

Until 2008, the economics profession considered a contractionary equilibrium (the \$500 economy) brought about by a lack of borrowers to be an exceptionally rare occurrence—the only recent example was the Great Depression, which was triggered by the stock market crash in October 1929 and during which the U.S. lost 46 percent of nominal GNP. Although Japan fell into a similar predicament when its asset price bubble burst in 1990, its lessons were almost completely ignored by the economics profession until the Lehman shock of 2008².

Economists failed to consider the case of insufficient borrowers because when macroeconomics was emerging as a separate academic discipline in the 1940s there were plentiful investment opportunities for businesses in the West: new "must-have" household appliances ranging from washing machines to television sets were being invented one after another. With businesses trying to start or expand production of all these new products, there were plenty of borrowers in the private sector, and interest rates were quite high.

With borrowers never in short supply, economists' emphasis was very much on the availability of savings and the correct use of monetary policy to ensure that businesses obtained the funds they needed at interest rates low enough to enable them to continue investing. Economists also disparaged fiscal policy—i.e., government borrowing and spending—when inflation became a problem in the 1970s because they were worried the public sector would squander the precious savings of the private sector on inefficient pork-barrel projects.

During this period economists also assumed the financial sector would ensure that all saved funds were automatically borrowed and spent, with interest rates moving higher when there were too many borrowers relative to savers and lower when there were too few. It is because of this assumed

²One exception was the National Association of Business Economists in Washington, D.C., which awarded its Abramson Award to a paper by the author titled "The Japanese Economy in Balance Sheet Recession," published in its journal *Business Economics* in April 2001.

automaticity that most macroeconomic theories and models developed prior to 2008 contained no financial sector.

However, the advent of major recessions in 1990 in Japan and in 2008 in the West demonstrated that private-sector borrowers can disappear altogether—even at a time of zero or negative interest rates—when they face daunting financial problems after the collapse of a debt-financed bubble. In both post-1990 Japan and the post-2008 Western economies, borrowers vanished due to a similar sequence of events.

It all starts with people leveraging up in an asset price bubble in the hope of getting rich quickly. For example, if the value of a house bought entirely with cash rises from \$1 million to \$1.2 million in a year, the buyer enjoys a 20 percent return. But if the same person buys the house with a 10 percent down payment and borrows the rest, she will have increased an initial investment of \$100,000 in down payment to \$300,000, for a return of 200 percent. If the interest rate on the \$900,000 is 5 percent, she will have made \$200,000 less the interest cost of \$45,000, or \$155,000, representing an annual return of 155 percent. The prospect of easily doubling or tripling one's money leads many to leverage up during bubbles by borrowing and investing more.

When the bubble bursts and asset prices collapse, however, these people are left with huge debts and no assets to show for them. In the above example, if the value of the house falls by 30 percent to \$700,000 but the buyer is still carrying a mortgage worth \$900,000, the owner will be \$200,000 underwater. If she has little in the way of other assets, she will be effectively bankrupt. People whose balance sheets are underwater have no choice but to pay down debt or rebuild savings to restore their financial health.

With their financial survival at stake, they are in no position to borrow even if interest rates are brought down to zero. There will not be many willing lenders, either, especially when the lenders themselves have balance sheet problems, which are frequently the case after the bursting of a bubble. That means these households and businesses shift their priorities from profit maximization to *debt minimization* once they face the solvency constraint. Since asset bubbles can collapse abruptly, the private sector's shift to debt minimization can also happen quite suddenly.

No Name for Recession Driven by Private-Sector Debt Minimization

Although it may come as a shock to non-economist readers, the economics profession did not envision a recession driven by private-sector debt minimization until quite recently. In other words, the \$1,000-\$900-\$810-\$730

deflationary process fueled by the balance sheet concerns of over-leveraged borrowers was never discussed. Economists simply ignored the whole issue of financial health or the need to restore it when building their macroeconomic theories and models because they assumed the private sector would always try to maximize profits.

But two conditions must be satisfied for the private sector to maximize profits: it must have a clean balance sheet, and there must be attractive investment opportunities. By taking it as given that the private sector is always maximizing profits, economists assumed, mostly unconsciously, that both of these two conditions are always satisfied. And that was in fact the case for many decades—until asset bubbles burst in Japan in 1990 and in the Western economies in 2008. When that happened, millions of private-sector balance sheets were impaired, resulting not only in the disappearance of borrowers, but also in many borrowers starting to pay down debt in spite of record low interest rates.

Flow-of-funds data for the advanced economies indeed show a massive shift in the private sector's behavior before and after 2008 (Figure 1.1). Flow-of-funds data indicate whether a particular sector of an economy is

(% of GDP)								(% of GDP)
	5 years to Q3 2008	from Q4 2008 to present ⁴	latest 4 quarters			5 years to Q3 2008 ^I	from Q4 2008 to present ⁴	latest 4 quarters
UK	1.63	3.38	-2.97		Germany	8.46 ³	7.04	12.13
U.S.	0.48	5.21	4.12		France	2.54	2.36	-0.07
Canada	-0.02	-1.21 ⁵	-1.77		Italy	1.48	2.75	6.19
Japan	7.68 ²	8.57	6.24		Spain	-8.02	7.15	6.40
Korea	-1.89	4.04	4.58		Greece	-1.53	2.64	0.64
Australia	-7.77	0.09	0.39		Ireland	-5.41	7.28	0.40
Eurozone	1.65	5.01	4.62		Portugal	-3.97	4.42	3.61

FIGURE 1.1 Private-sector¹ Savings Behavior Changed Dramatically After 2008

Average Annual Private Sector Financial Surplus (+) or Deficit (-)

Notes: *Based on these countries' flow-of-funds and national accounts data. 1. Private sector = household + corporate + financial sectors. 2. In balance sheet recession since 1990. 3. In balance sheet recession since 2000. 4. Until Q1 2017. Only for France, Greece, and Ireland, Q4 2016. 5. Except Canada.

Source: Nomura Research Institute

a net supplier or borrower of funds by looking at changes in its financial assets and financial liabilities.

If the sector's financial assets increased more than its financial liabilities, it is considered to be in financial surplus—in other words, it is a net saver, or a net supplier of funds to the economy. If the sector's financial assets increased less than its financial liabilities, it is considered to be in financial deficit, which means it is a net borrower of funds. It should be noted that the concept of financial surplus in the flow-of-funds data is not the same as the frequently used "savings rate" because the latter is adjusted for depreciation and other factors that affect net additions to the saver's wealth.

Flow-of-funds data typically divide the economy into five sectors: household, non-financial corporate, financial, government, and the rest of the world. The data are compiled in such a way that these five sectors always add up to zero. The data therefore show who saved and who borrowed within the economy.

In the U.S., however, the five sectors do not sum to zero. This is because the compiler of these data, the Federal Reserve, believes that it is better to share with the public the raw data it collected rather than go through the additional iteration of adjustments and estimations needed to ensure that the numbers add up to zero.

These data, like many macroeconomic statistics, are frequently revised as more complete information becomes available. And as noted in the author's previous work³, these revisions can be quite large. Anyone who uses these data must therefore view each statistic with a certain amount of latitude given the possibility of subsequent revisions. The numbers used in this book reflect what was available on the internet on August 2nd, 2017. In this book, the term "private sector" is used to mean the sum of the household, non-financial corporate, and financial sectors.

According to these data, which are shown in Figure 1.1, the entire U.S. private sector has been saving an average of 5.21 percent of GDP since the third quarter of 2008, when interest rates fell almost to zero in the wake of Lehman Brothers' collapse. The corresponding figures are 7.15 percent for Spain's private sector, 7.28 percent for Ireland's, and 4.42 percent for Portugal's. In Japan, where the bubble burst in 1990 and interest rates have been essentially zero or negative since 1997, the private sector was saving an average of 7.68 percent of GDP even *before* Lehman's failure and 8.57 percent of GDP in the eight years afterwards. In Germany, where the dotcom bubble in the Neuer Markt, the local equivalent of Nasdaq, burst

³For example, see Koo, Richard (2015) *The Escape from Balance Sheet Recession and the QE Trap*, Singapore: John Wiley & Sons, Chapter 3.

in 2000, the private sector was saving a full 8.46 percent of GDP *before* the Lehman bankruptcy and 7.04 percent thereafter.

These are very disturbing numbers because businesses and households should be massive *borrowers* at today's ultra-low interest rates. Instead, they have been saving huge amounts in an attempt to rebuild their damaged balance sheets. In effect, the private sectors in all the advanced countries except Canada are operating outside the realm of textbook economics.

The abrupt shift from the pre-Lehman to the post-Lehman world, shown in the third column of Figure 1.1, was nothing short of spectacular. In both Spain and Ireland, for example, the shift in private-sector behavior from borrowing to saving amounted to well over 10 percent of GDP. And that is comparing the five-year average before Lehman and the eight-year average after Lehman.

The shift in private-sector behavior immediately before and after the Lehman failure was even bigger, reaching well over 20 percent of GDP in many countries. Such a huge and abrupt shift from net borrowing to net saving will throw any economy into a recession. And households and businesses will not start borrowing again until they feel comfortable with their financial health. These disturbing numbers will be revisited throughout this book.

Yet economists continue to assume (often implicitly) that borrowers are plentiful because their models and theories all assume that the private sector is maximizing profits. Their forecasts for growth and inflation, which are based on those models and theories, have consistently and repeatedly missed the mark since 2008 because the assumption of a profit-maximizing private sector is no longer valid in the post-bubble world. Moreover, because the assumption of a profit-maximizing private sector is so fundamental to their models and theories, most economists failed to suspect that their models have foundered because this basic assumption about private-sector behavior is no longer valid.

Mikhail Gorbachev famously said, "You cannot solve the problem until you call it by its right name." When the economic crisis hit in 2008, the economics profession had not only neglected to consider the possibility of a recession caused by a debt-minimizing private sector, but it did not even have a name for the phenomenon. Indeed, the author had to coin the term *balance sheet recession* in the late 1990s to describe this economic disease in a Japanese context⁴. This term finally entered the lexicon of economics in

⁴The author acknowledges the inspiration given to him by Mr. Edward Frydl, his former boss at the Federal Reserve Bank of New York, who used the term "balance sheet-driven recession" when we were discussing the U.S. economy of the early 1990s.

the West with the 2008 collapse of Lehman Brothers and the global financial crisis that followed.

Economists' inability to consider the possibility that borrowers might stop borrowing or actually start paying down debt has already resulted in some very bad outcomes, including the Great Depression in the U.S. and the rise of the National Socialists in Germany in the 1930s. European policymakers' continued failure to understand balance sheet recessions has enabled the emergence of similar far-right political groups in the Eurozone since 2008. These economic and political issues are addressed in Chapter 7.

Paradox of Thrift Was Norm Before Industrial Revolution

For thousands of years before the Industrial Revolution in the 1760s, however, economic stagnation due to a lack of borrowers was much closer to the norm. As shown in Figure 1.2, economic growth had been negligible for centuries before 1760. Even then, there were probably millions who tried



FIGURE 1.2 Economic Growth Became the Norm Only After the Industrial Revolution

Source: Angus Maddison, "Historical Statistics of the World Economy: 1-2008 AD", www.ggdc.net/maddison/Historical_Statistics/Verticel-file_02-2010.xls

to save—after all, human beings have always worried about an uncertain future. Preparing for old age and the proverbial rainy day is an ingrained aspect of human nature. But if it is only human to save, the centuries-long economic stagnation prior to the Industrial Revolution must have been due to a lack of borrowers.

The private sector must have a clean balance sheet and promising investment opportunities to borrow. After all, businesses will not borrow unless they feel sure the debt can be paid back with interest. But before the Industrial Revolution, which was essentially a technological revolution, there was little or no technological innovation, and therefore few investments capable of paying for themselves.

Businesses also tend to minimize debt when they see no investment opportunities because the probability of bankruptcy can be reduced drastically by eliminating debt. Japanese firms dating back several centuries, many of which can be found in and around Kyoto and Nagoya, typically do not borrow money for this reason. And if they do, they pay it back at the earliest opportunity to minimize the risk of bankruptcy. It is therefore appropriate for businesses to minimize debt until investment opportunities present themselves, with the possible exception of tax considerations. Given the dearth of investment opportunities prior to the Industrial Revolution, it is not hard to understand why there were so few willing borrowers.

Amid this absence of investment opportunities in the pre-1760 world, efforts to save only caused the economy to shrink. The result was a permanent paradox of thrift in which people tried to save but their very actions and intentions kept the national economy in a depressed state. This state of affairs lasted for centuries in both the East and the West.

Powerful rulers sometimes borrowed funds saved by the private sector and used them to build social infrastructure or monuments. The vicious cycle of the paradox of thrift was then suspended as the government borrowed the private sector's savings (the initial savings of \$100 in the example above) and injected them back into the income stream, fueling rapid economic growth. But unless the project paid for itself—and politicians are seldom good at selecting investments that pay for themselves the government, facing a mounting debt load, would at some point get cold feet and discontinue its investment. The broader economy would then fall back into the stagnation that characterizes the paradox of thrift. Consequently, these regimes were often outlived by the monuments they created. The challenging task of selecting viable public works projects is revisited in Chapter 4.

Countries also tried to achieve economic growth by expanding their territories, i.e., by acquiring more land, which was the key factor of production in pre-industrial agricultural societies. Indeed, for centuries until 1945, people believed that territorial expansion was essential for economic growth (the significance of this date is explained in Chapter 3). This territorial drive for prosperity was the economic rationale for colonialism and imperialism. But both were basically a zero-sum proposition for the global economy and also resulted in countless wars and deaths.

Ironically, the wars and resulting destruction produced investment opportunities in the form of postwar reconstruction activity. And wars were frequent occurrences in those days. But without a continuous flow of innovation, investment opportunities soon exhausted themselves and economic growth petered out.

Four Possible States of Borrowers and Lenders

The discussion above suggests that an economy is always in one of four possible states depending on the presence or absence of lenders (savers) and borrowers (investors). They are as follows: (1) both lenders and borrowers are present in sufficient numbers, (2) there are borrowers but not enough lenders even at high interest rates, (3) there are lenders but not enough borrowers even at low interest rates, and (4) both lenders and borrowers are absent. These four states are illustrated in Figure 1.3.

Of the four, only Cases 1 and 2 are discussed in traditional economics, which implicitly assumes there are always enough borrowers as long as real interest rates are low enough. Or, more precisely, economists who argue that lower real interest rates are needed to stimulate the economy are assuming that the economy is in Case 1 or Case 2. Of the two, only Case 1 requires a minimum of policy intervention—such as slight adjustments to interest rates—to match savers and borrowers and keep the economy going. Case 1, therefore, is associated with ordinary interest rates and can be considered the ideal textbook case.

The causes of Case 2 (insufficient lenders) can be traced to both macro and financial factors. The most common macro factor is when the central bank tightens monetary policy to rein in inflation. The tighter credit conditions that result certainly leave lenders less willing to lend. Once inflation is under control, however, the central bank typically eases monetary policy, and the economy returns to Case 1.

A country may also be too poor or underdeveloped to save. If the paradox of thrift leaves a country too poor to save, the situation would be classified as Case 3 or 4 because it is actually attributable to a lack of borrowers.

Financial factors weighing on lenders may also push the economy into Case 2. One such factor is an excess of non-performing loans (NPLs) in the banking system, which depresses banks' capital ratios and prevents



FIGURE 1.3 Borrowers and Lenders—Four Possible States

1. Lenders and borrowers are present in sufficient numbers (textbook world) \Rightarrow Ordinary interest rates.

2. Borrowers are present but not lenders due to the latter's bad loan problems (financial crisis, credit crunch) \Rightarrow Loan rates much higher than policy rate.

3. Lenders are present but no borrowers, due to the latter's balance sheet problems and/or lack of investment opportunities (balance sheet recession, "secular" stagnation) \Rightarrow Ultra-low interest rates.

4. Borrowers and lenders both absent due to balance sheet problems for the former and bad loan problems for the latter (aftermath of a bubble burst) \Rightarrow Ultra-low interest rates, but only for highly rated borrowers

them from lending. This is what is typically called a "credit crunch." Over-regulation of financial institutions by the authorities can also lead to a credit crunch. When many banks encounter NPL problems at the same time, mutual distrust may lead not only to a credit crunch but also to a dysfunctional interbank market, a state of affairs typically referred to as a "financial crisis."

When lenders have NPL problems, the central bank's policy rate could diverge significantly from actual lending rates set by the banks, and only those willing to pay the high actual rates will be able to borrow. Monetary authorities may also allow such "fat spreads" deliberately in certain circumstances to strengthen banks' balance sheets.

Cultural norms discouraging savings, as well as income (and productivity) levels that are simply too low to allow people to save, are developmental phenomena typically found in pre-industrialized societies. An underdeveloped financial system, due in some cases to religious considerations, may also constrain lending. These developmental issues can take many years to address.

However, non-developmental causes of a shortage of lenders all have well-known remedies in the literature. For example, the government can inject capital into the banks to restore their ability to lend, or it can relax regulations preventing financial institutions from serving as financial intermediaries.

In the case of a dysfunctional interbank market, the central bank can act as lender of last resort to ensure the clearing system continues to operate. It can also relax monetary policy. The conventional emphasis on monetary policy and concerns over the crowding-out effect of fiscal policy are justified in Cases 1 and 2, where there are borrowers but (for a variety of reasons in Case 2) not enough lenders. Lender-side problems such as credit crunches and financial crises are discussed in more detail in Chapter 8.

The problem comes with Cases 3 and 4, where the bottleneck is a shortage of *borrowers*. This is the *other half of macroeconomics* that has been overlooked by traditional economists.

As noted above, there are two main reasons why private-sector borrowers might disappear. The first is that they cannot find attractive investment opportunities at home, and the second is that their financial health has deteriorated to the point where they cannot borrow until they repair their balance sheets. Examples of the first case would include the world that existed prior to the Industrial Revolution or a country where the return on capital was much higher abroad than at home, while examples of the second case can be observed following the collapse of debt-financed asset bubbles.

Most advanced countries today suffer from both of these factors, which have served to reduce the number of borrowers. Because balance sheet problems are more urgent in the sense that they can depress the economy very quickly, they are discussed first, in Chapter 2, although the main thrust of this book involves the second case and is explored in Chapters 3, 4, and 5. Those already familiar with the concept of balance sheet recessions and who aware of where the major countries stand on this issue may wish to proceed directly to Chapter 3.