Chapter 13

The 2007-2009 financial crisis and recession: Reflections in the national accounts

This chapter describes the financial crisis and recession as reflected in the national accounts of OECD countries. It first summarises how the 2008-09 recession affected GDP and other major national accounts data, including the financial accounts and balance sheets, focusing on the experience of the OECD in aggregate and of the G7 countries. Next, the chapter considers how the rate of recovery has differed across countries since 2009. It then looks back at the period leading up to the recession and at how some of the imbalances were reflected in national accounts. The chapter concludes by considering the data gaps in accounts that were exposed by the crisis: what relevant information would policy makers have liked to have had, but which national accounts were unable to provide? It also discusses some of the steps that are being taken to address these gaps.

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During 2000 through 2006, real estate prices in the United States and a number of other OECD countries increased rapidly in what is now widely considered to have been a bubble. Prices peaked in the United States and began falling, which placed stress on debt that was secured by home mortgages (see Figure 13.1). The use of "subprime" mortgages – that is, mortgages made to US borrowers who were considered especially risky – grew rapidly during the period, but in 2006 the rate of serious delinquencies (the share of subprime mortgages that were in foreclosure or with more than 90 days overdue) began to rise sharply. By the first half of 2007, news reports were warning that subprime mortgages could be a threat to the markets and policy makers were discussing possible regulatory responses.[1] However, few macroeconomists were able to forecast the consequences for the financial system and the global economy of this heightened level of risk. In August 2007, events reached the crisis stage when BNP Paribas, one of the largest banks in the world, announced that it would halt redemptions on three investment funds due to subprime loan losses in the United States. With financial markets that are now totally interlinked, investors throughout the world began trying to withdraw funds, freezing the markets. Both the US Federal Reserve and the European Central Bank expanded lending to counteract the liquidity shortage.[2]

In September 2007, Northern Rock, the United Kingdom's fifth-largest mortgage lender, was facing a run on deposits until the Bank of England provided a liquidity injection, and in February it was taken into state ownership. In March 2008, Bear Stearns, a leading US investment bank, was facing bankruptcy until the Treasury and Federal Reserve arranged for it to be sold to JP Morgan Chase, using a USD 30 billion loan guarantee from the Fed. Meanwhile, most OECD countries began falling into recession as GDP started to decline in the first half of 2008.

In July 2008, another US financial institution, IndyMac Bank, failed. On September 7, Fannie Mae and Freddie Mac, the two largest US guarantors of securitised mortgage instruments, were placed in government conservatorship. On September 15, Lehman Brothers, the fourth largest investment bank in the United States, filed for bankruptcy. The next day, AIG, one of the largest insurance companies in the world, was kept afloat with the announcement of a loan of up to USD 85 billion from the Federal Reserve. These events set off a worldwide financial panic. The so-called "shadow

Figure 13.1. **United States house price indexes (2000 Q1-2013 Q3)**

2000 Q1 = 100
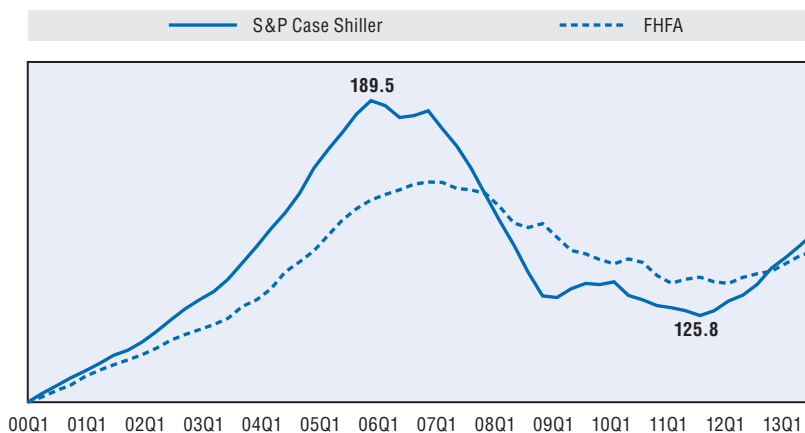
Note: The S&P Case-Shiller US national composite home price index is a proprietary index that includes all types of mortgages and weights transactions according to value. The FHFA index is the Federal Housing Finance Agency's all-transactions house price index. It is based on repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitised by Fannie Mae or Freddie Mac; it excludes houses financed by "non-conforming" mortgages, such as jumbo and subprime mortgages, which tend to have more volatile prices than houses financed by conforming mortgages.
Source: FRED (Federal Reserve Economic Data), Federal Reserve Bank of St. Louis, *http://research.stlouisfed.org/.*　　　　StatLink ᔈᔍᔎ *http://dx.doi.org/10.1787/888933144236*

banking" system, which had grown to rival the traditional commercial banks, faced a run as investors endeavored to withdraw funds and flee to safety. The TED spread – the difference between interbank rates and short-term US Treasury rates – spiked, reflecting much heightened levels of credit risk.

Over the next few weeks, governments and central banks throughout the world took extraordinary actions to try to restore liquidity and confidence. Meanwhile, GDP throughout most of Europe, North America, and Japan plunged. Economic activity in most countries reached a trough in the first half of 2009, and since then the recovery has generally been slow and erratic, particularly in the Euro area, where the original crisis was aggravated by a crisis of confidence in Euro-area government bonds, first in Greece, followed by Ireland, Portugal, Spain and other countries.

This chapter describes the financial crisis and recession as reflected in the national accounts of the 34 advanced economies that are members of the OECD. It will provide a summary of how the 2008-09 recession affected GDP and other major national accounts data, including the financial accounts and balance sheets, with the primary focus being on the experience of the OECD in aggregate and of the G7 countries, though specific experiences of several other countries will also be mentioned. Next the chapter provides a summary of the period of recovery since 2009 and of the differences between countries in the

rate of recovery. It will next discuss the period leading up to the recession and how some of the imbalances were reflected in the accounts. The chapter concludes with a discussion of some of the data gaps that were exposed by the crisis – relevant information that policy makers would like to have had, but which the national accounts were unable to provide. It also discusses some of the steps that are being taken to address these measurement gaps with the objective of trying to avoid in the future what happened in this crisis – the inability of economists to forecast and prevent such a major crisis.

In 2008, the OECD countries represented 69% of the world's GDP based on exchange rates, or 55% of the world's GDP based on purchasing power parities, according to the IMF's World Economic Outlook database from October 2013. In turn, the G7 countries – United States, Japan, Germany, France, United Kingdom, Italy, and Canada – represented 77% of the OECD's GDP based on exchange rates, or 76% of the OECD's GDP based on purchasing power parities.

On the other hand, this chapter does not attempt to provide an accounting of the explanations for the financial crisis, nor does it provide an analysis of the policies that were used or might have been used either to avert the crisis or to speed the recovery. Many books have already been written on these subjects, and doubtless more will be written in years to come.[3] Although there is much interest in the policy implications of the financial crisis, analysis of the implication is beyond the scope of this chapter.

1. The Great Recession

The Great Recession of 2008-09 was the most severe global economic downturn since the Great Depression of the 1930s. Most of the advanced economies that are represented in the OECD fell into recession during this period, with large declines in economic activity as measured by real GDP. Changes in nominal GDP and various price deflators can help us understand the relative importance of changes in aggregate demand and aggregate supply. Furthermore, the effects of the recession were reflected in many of the other balances that are included in the quarterly national accounts, such as in the measures of disposable income, saving, and net lending, as well as in the national and institutional sector balance sheets.

Real GDP

Over the four quarters from the first quarter of 2008 to the first quarter of 2009, real GDP of the OECD countries in aggregate decreased 4.9% (see Table 13.1 and Figure 13.2).[4] The recession was initially relatively mild, with

Table 13.1. **Peak quarter, trough quarter, and cumulative change in real GDP, OECD Countries, During the Great Recession**

Country	Peak	Trough	Change in real GDP	Number of quarters to surpass pre-crisis peak
Austria	Q1 2008	Q2 2009	-5.1%	13
Belgium	Q2 2008	Q1 2009	-4.3%	11
Canada	Q3 2008	Q2 2009	-4.2%	9
Chile	Q1 2008	Q1 2009	-3.1%	7
Czech Republic	Q3 2008	Q2 2009	-5.6%	*
Denmark	Q2 2008	Q2 2009	-8.0%	*
Estonia	Q4 2007	Q3 2009	-20.0%	*
Finland	Q4 2007	Q2 2009	-10.4%	*
France	Q1 2008	Q2 2009	-4.4%	*
Germany	Q1 2008	Q1 2009	-6.8%	12
Hungary	Q1 2008	Q3 2009	-8.5%	*
Iceland	Q3 2007	Q2 2010	-12.8%	*
Ireland	Q4 2007	Q4 2009	-11.5%	*
Israel	Q3 2008	Q1 2009	-0.9%	4
Italy	Q3 2007	Q2 2009	-7.2%	*
Japan	Q1 2008	Q1 2009	-9.2%	*
Korea	Q3 2008	Q4 2008	-4.6%	4
Luxembourg	Q1 2008	Q1 2009	-9.4%	*
Mexico	Q2 2008	Q2 2009	-6.7%	9
Netherlands	Q1 2008	Q2 2009	-5.0%	*
New Zealand	Q4 2007	Q1 2009	-2.6%	8
Norway	Q4 2007	Q2 2009	-3.4%	17
Poland	Q3 2008	Q4 2008	-0.4%	3
Portugal	Q4 2007	Q1 2009	-4.2%	*
Slovak Republic	Q4 2008	Q1 2009	-8.5%	10
Slovenia	Q2 2008	Q4 2009	-9.7%	*
Spain	Q1 2008	Q4 2009	-5.0%	*
Sweden	Q4 2007	Q1 2009	-7.6%	12
Switzerland	Q3 2008	Q2 2009	-3.3%	8
Turkey	Q1 2008	Q1 2009	-13.3%	9
United Kingdom	Q1 2008	Q3 2009	-7.2%	*
United States	Q4 2007	Q2 2009	-4.3%	14
Euro area (17 countries)	Q1 2008	Q2 2009	-5.7%	*
OECD – Total	**Q1 2008**	**Q1 2009**	**-4.9%**	**14**

* As of Q3 2013, the pre-crisis peak in real GDP had not been surpassed.

Source: OECD (2012), "Quarterly National Accounts", OECD National Accounts Statistics (database), doi: *http://dx.doi.org/10.1787/data-00017-en*.

Figure 13.2. **Real GDP for OECD – Total and G7 Countries (2005 Q1-2013 Q3)**
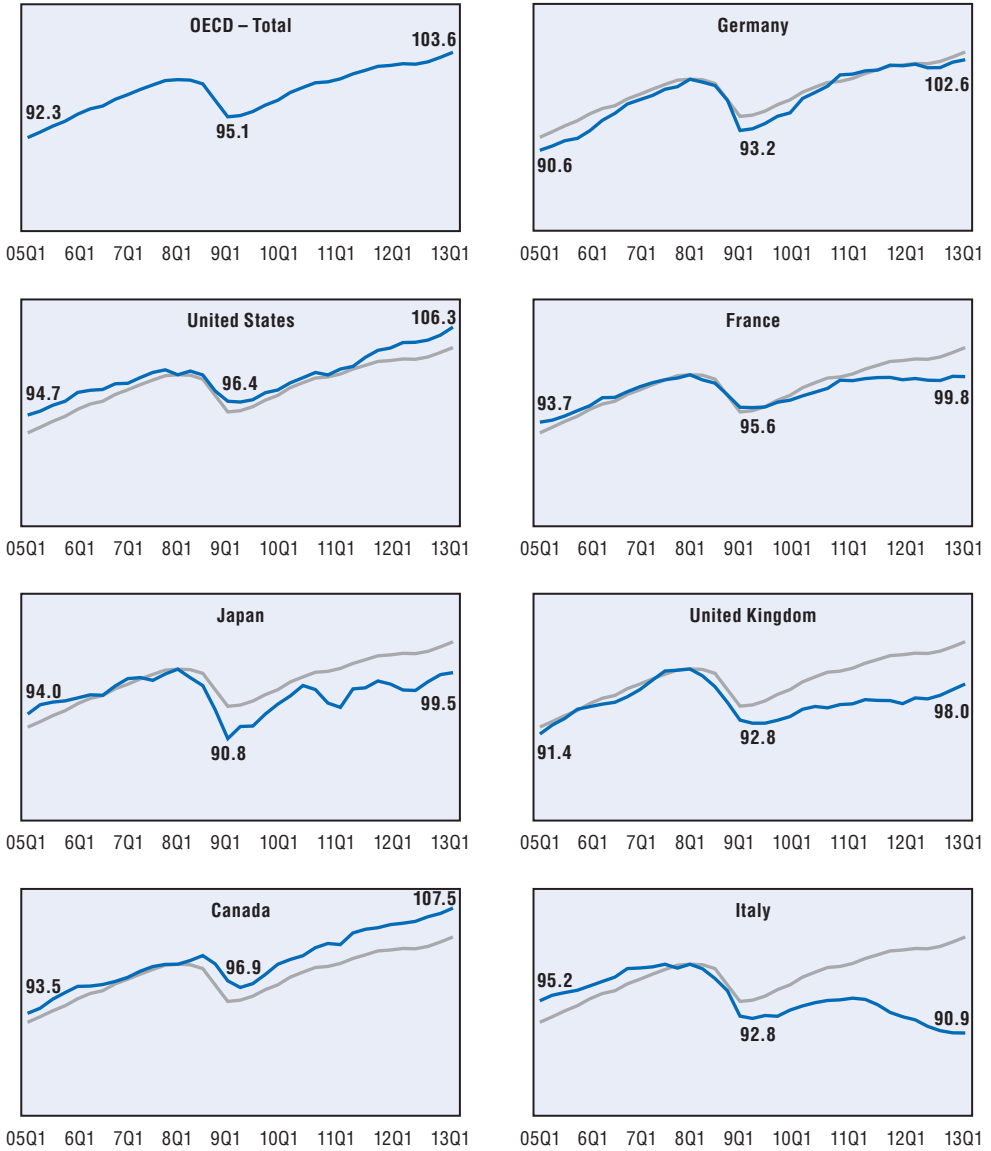
2008 Q1 = 100

Source: OECD (2012), "Quarterly National Accounts", OECD National Accounts Statistics (database), doi: *http://dx.doi.org/10.1787/data-00017-en.*

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OECD total real GDP declining only 0.1% in the second quarter of 2008. But the pace of the descent accelerated in the third quarter to 0.5%, and in the fourth quarter, following the bankruptcy of Lehman Brothers and the ensuing financial panic, GDP fell an additional 2.2%. In the first quarter of 2009, real GDP fell another 2.3% as it reached its cyclical trough.

Although there were some differences among the OECD countries in the timing and duration of the recession, the sharp decreases in the fourth quarter of 2008 and the first quarter of 2009 were synchronous among almost all of advanced economies. The real GDP of the United States reached its cyclical peak in the fourth quarter of 2007; it then decreased 0.7% in the first quarter of 2008, before rebounding with an increase of 0.5% in the second quarter. GDP turned down again in the third quarter, decreasing 0.5%, then fell 2.2% in the fourth quarter, 1.4% in the first quarter of 2009, and another 0.1% in the second quarter of 2009. In all, the Great Recession lasted six quarters in the United States and real GDP declined 4.3%.

In Europe, the declines in real GDP were even more severe. Among the OECD countries in Europe, GDP in aggregate decreased 5.7% from the first quarter of 2008 to the first quarter of 2009. Germany's GDP fell 6.8%, and France's GDP fell 4.4%. The decline in Italy's GDP began somewhat earlier, and it fell a cumulative 7.2% by the second quarter of 2009. The UK GDP also fell 7.2%. In many European countries, the level of pre-crisis peak was still not recovered in Q3 2013, 20 quarters after the first impact of the crisis.

The impact of the Great Recession was especially severe in Japan, where real GDP fell 9.2%. In Canada, on the other hand, the recession began relatively late, as the economy had been bolstered in the first half of 2008 by strong commodities prices. From the third quarter of 2008 through the second quarter of 2009, however, Canada's real GDP decreased 4.2%.

Similar patterns appeared among most of the OECD countries outside of the G7, though several countries experienced especially deep downturns. Estonia's GDP fell 20.0%. In Iceland, where the financial crisis led to the collapse of country's three largest commercial banks, the recession began earlier and lasted longer than in the other OECD countries; Iceland's GDP reached its trough in the second quarter of 2010, 12.8% below its cyclical peak. Ireland's GDP fell 11.5% from the fourth quarter of 2007 to the fourth quarter of 2009.

At the other end of the spectrum, a few OECD countries managed to avoid the worst effects of the global recession and did not experience the two consecutive quarters of decline in real GDP that typically denotes a recession. Poland's GDP fell in only one quarter, the fourth quarter of 2008, and only by 0.4%. The only quarterly decrease in Australia's GDP during the Great Recession occurred in the same quarter, a fall of 0.9%.[5] The GDP of Korea also only fell for one quarter, again the fourth quarter of 2008, though by a substantially larger

amount, 4.6%. The GDP of the Slovak Republic also fell in a single quarter, the first quarter of 2009, but with a drop of 8.5% it can hardly be considered to have avoided the effects of the global recession. Finally, though the GDP of Israel experienced two quarters of decrease from the third quarter of 2008 to the first quarter of 2009, the cumulative decline was a relatively mild 0.9%.

In the emerging markets outside of the OECD, the impact of the Great Recession was more varied. A number of countries experienced downturns at the same time as the advanced countries. For example, South Africa's GDP decreased 2.7% over three quarters, Brazil's GDP decreased 5.4% over two quarters, and the GDP of the Russian Federation decreased 10.7% over four quarters. On the other hand, emerging markets in Asia appear to have been more insulated from the recession, with India experiencing only one quarter of decline, -1.9%, and Indonesia's GDP never declined. For China, we lack seasonally adjusted quarterly GDP measures for that period, but the annual GDP measures and other available data suggest that China's economy also continued to grow throughout the period.

Turning to the major components of GDP expenditures, most OECD countries experienced a similar pattern of change. For the OECD in total, real private (that is, households and non-profit institutions serving households) final consumption expenditures decreased 2.7% over the recession – a decrease that was smaller than the overall decrease in GDP, but nevertheless a major contributor to the drop in demand, due to the large share of private final consumption expenditures in final demand (see Figure 13.3). The decreases were more pronounced in gross fixed capital formation (including construction of new dwellings), which began falling in the first quarter and had decreased 15.1% over seven quarters when it reached its trough in the third quarter of 2009. In contrast, the decline in aggregate exports of the OECD countries lasted only three quarters, from the second quarter of 2008 to the first quarter of 2009, but the total decrease was very large, 15.2%. The decline in aggregate imports lasted a little longer; from the first quarter of 2008 to the second quarter of 2009, imports of goods and services fell 16.9%. In contrast, countercyclical fiscal policy contributed to growth in real general government final consumption expenditures, which increased 2.9% in OECD countries during the recession. Only later, during the recovery phase, would general government final consumption expenditures begin to decline as austerity measures were adopted. As described in Box 13.1, fiscal policy is reflected in several components of GDP, and not only in general government final consumption expenditures.

The national accounts also provide information on value added by industry. The downturn was concentrated in manufacturing and in the associated goods distribution industries of wholesale and retail trade and transportation. For example, for the European Union, the volume index for manufacturing gross value added fell 16.3% from 2007 to 2009; in the United States, it fell 11.5%. The construction industry in the United States,

Figure 13.3. **Real GDP by final expenditure category, OECD-Total
(2005 Q1-2013 Q3)**

2008 Q1 = 100
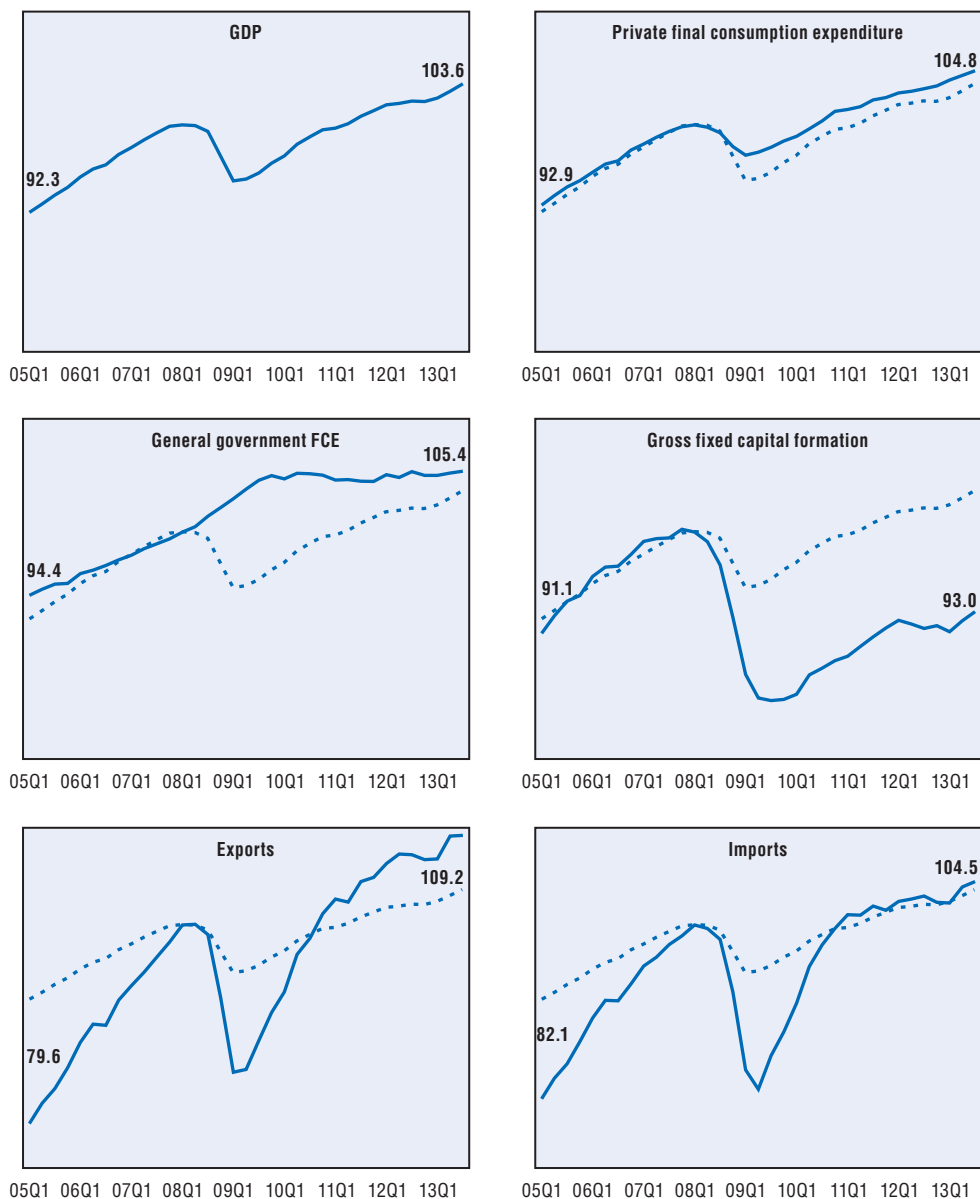
Source: OECD (2012), "Quarterly National Accounts", OECD National Accounts Statistics (database), doi: *http://dx.doi.org/
10.1787/data-00017-en.*

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Box 13.1. **Countercyclical fiscal policy in the national accounts**

Countercyclical fiscal policy consists of increases in general government expenditures or reductions in taxes or other revenues that are intended to boost aggregate demand. Although government can boost demand directly through increases in final consumption expenditures, more often the countercyclical policy aims to boost household final consumption expenditures through reductions in taxes or increases in social benefits, or gross fixed capital formation through subsidies, capital transfers, or reductions in taxes.

An example of countercyclical fiscal policy was the American Recovery and Reinvestment Act of 2009 in the United States, which was enacted in February 2009. The estimated cost of the act in terms of increased expenditures and reduced receipts was USD 825.4 billion, with most of the costs occurring during the first three years. After accounting of the effects of the act through the first quarter of 2013, about 26% of the costs to the government came in the form of reduced taxes and other receipts, and about 74% came in the form of additional expenditures. The additional expenditures were primarily for social benefits (such as unemployment benefits and refundable tax credits) and for grants to state and local government; only 7.3% was spent by the federal government on final consumption or gross fixed capital formation that enters GDP expenditures directly (see Table 13.2).

Table 13.2. **Share of Costs the American Recovery and Reinvestment Act, by type of transaction**

Federal Government Transaction	Percent of total cost of act
Receipts (reductions)	25.7%
Current taxes on income, wealth, etc. (households)	23.1
Current taxes on income, wealth, etc. (corporations)	2.5
Expenditures (additions)	74.3
Final consumption expenditures	5.1
Current transfer payments	54.7
Social benefits	25.0
Other current transfers (primarily grants to state & local government)	29.8
Gross fixed capital formation	2.2
Capital transfer payments	10.0

Source: US Bureau of Economic Analysis, Federal recovery programs and BEA statistics, *www.bea.gov/recovery/*.

experienced a long, steep decline that began before the recession, with real gross value added falling 28.5% from 2005 to 2010. Also, finance and insurance activity in the United States was adversely impacted by the drop off in mortgage activity and by the financial crisis, falling 15.2% from 2006 to 2008, before rebounding in 2009.[6] (See Box 13.2)

Box 13.2. **How the financial crisis affected measures of financial services**

In Chapter 4, the section "Going Further: FISIM" describes how banks and other financial intermediaries provide services to their customers that are not invoiced directly. Although banks usually charge fees, their fees do not fully cover the cost of the services that they provide. A portion of the services that banks provide are paid for indirectly by charging a higher average rate of interest on the funds that they lend than the average rate of interest that they pay to depositors. The margin between these two rates of interest is another source of funds, in addition to fees, which can be used to pay for the provision of services and is known as financial intermediation services indirectly measured (FISIM). As described in Chapter 4, the cost of these services is assigned to depositors and to borrowers based on the differences between the depositor and borrower rates and a reference interest rate.

During the financial crisis, the first impact was an increase in the loans and other financial assets that were classified as nonperforming (that is, loans whose payments of interest or principal are past due by 90 days or more) or that defaulted. Nonperforming loans do not appear directly on the SNA balance sheets, though it recommends that they be recorded as memorandum items. In cases in which mortgages or other loans that were securitised, the market value of those securities fell during the crisis, which was reflected on the SNA balance sheets as a revaluation.

As the crisis proceeded, investors engaged in a "flight to quality," withdrawing funds from investments that were regarded as risky – causing their interest rates to rise – and moving their funds into the investments that were regarded as safe, such as Treasury securities or government-insured deposit accounts – causing their interest rates to fall. In terms of the national accounts measure of FISIM, there were several effects moving in different directions. In the case of the United States, for example, both the reference interest rate and the rate paid to depositors declined as part of the flight to quality. Rates charged on loans increased relative to the reference rate, but much of that increase represented charges that were required to offset the increased risk of default, which is not recognised as a cost of production in the SNA. Consequently, the US national accounts have decided to make an adjustment to their FISIM calculations to remove the effects of changes in expected defaults.[1] The FISIM estimates for the United States indicate that the value (in current prices) of both depositor and borrower services declined during the financial crisis, though the value of depositor services recovered relatively quickly[2] (see Chapter 4 for more).

1. See Hood, 2013.
2. The value of depositor services is presented on line 44, and the value of borrower services on line 96, of national income and product accounts table 7.11, Bureau of Economic Analysis website.

Aggregate demand and supply

Economists often explain recessions in terms of shifts in aggregate demand and aggregate supply. Although these are theoretical concepts, the measures in the national accounts can be used to represent these concepts in actual economic data.

Aggregate demand represents the relationship between the aggregate volume of goods and services that are demanded by final users and the aggregate price level. It is generally drawn as a downward sloping curve in which the volume of output demanded increases as the aggregate price level falls. The aggregate demand curve can shift in response to changes monetary or fiscal policy.[7]

Changes in aggregate demand will be reflected in changes in nominal GDP (which is the product of real GDP and the GDP price deflator), so the movements in nominal GDP are often taken to be an approximate indicator of aggregate demand. Figure 13.4 shows changes in the nominal GDP for the United States and the Euro area, both areas showing a sharp downward shift during the Great Recession. After the Great Recession, nominal GDP in the United States resumed growing, though it never exhibited accelerated growth to allow it to catch up to the previous trend line. In the Euro area, nominal GDP experienced a second slowdown beginning in 2011 and is now far below its pre-recession trend. Nominal GDP of most OECD countries fell in 2009, though notable exceptions included Australia, Israel, Korea, and Poland – countries that also managed to avoid the sustained effects of the recession. Decreases in aggregate demand, as measured by nominal GDP, appear to have been a major contributor to the recession in most countries.

Figure 13.4. **GDP in current prices, national currency, for United States and Euro Area Countries (2005 Q1-2013 Q3)**
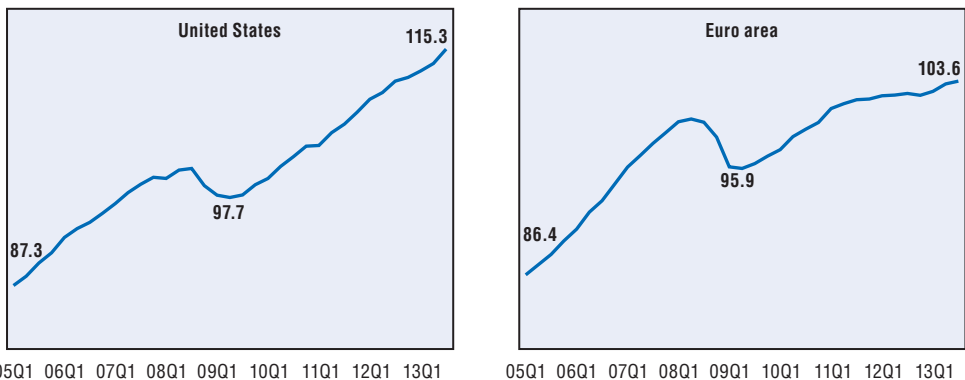
2008 Q1 = 100

On the other hand, changes in aggregate supply – that is, a shift in the level of potential GDP – may be harder to characterise with national accounts data. In some cases, they may be associated with "stagflation" – that is, a decline in real GDP associated with acceleration in inflation. Because there are many factors that could cause the level of potential GDP to change, such as productivity shocks, changes in the terms of trade, or the deadweight losses associated with changes in taxes or regulations, it may not be possible to easily identify all changes in aggregate supply.

Although more difficult to measure, aggregate supply factors may have also contributed. In particular, the global prices of oil and other commodities increased sharply in the first half of 2008. This is because, despite the recession in OECD countries, the global demand for commodities remained high as the emerging part of the world – countries such as China, India, and Indonesia – continued to boom. The disconnect between the global situation of OECD countries and the outlook of big emerging countries is one of the important new features of the global economy. For countries that import commodities, these price increases contributed to consumer inflation and to deterioration in the terms of trade. For example, in the United States, the price index for private final consumption expenditure increased 4.0% from the third quarter of 2007 to the third quarter of 2008, whereas the GDP price index increased only 2.2% (see Figure 13.5). Over the same period, the terms of trade index (the ratio of the export price index to the import price index) fell from 100.0 to 92.5.[8] The increase in energy prices may have depressed consumer spending on other goods and services and increased the costs of manufacturing and other activities.[9] On the

Figure 13.5. **GDP Deflator and Private Final Consumption Expenditure Deflator, United States (2006 Q1-2010 Q3)**

2008 Q1 = 100
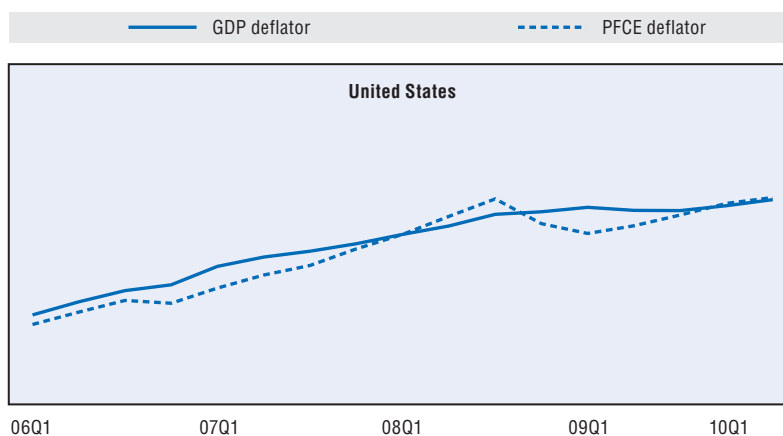
Source: OECD (2012), "Quarterly National Accounts", *OECD National Accounts Statistics* (database), doi: *http://dx.doi.org/10.1787/data-00017-en.* StatLink *http://dx.doi.org/10.1787/888933144277*

other hand, for countries that export commodities, the increase in commodity prices boosted their terms of trade and helped delay some of the adverse impacts of the financial crisis, though commodity prices ultimately dropped sharply in the fourth quarter as the effects of the Great Recession extended globally.

Saving, net lending or borrowing, and balance sheets

The effects of the global financial crisis and the Great Recession are apparent not only in the measures of production and income, but also in the effects on saving, net lending or borrowing, and on balance sheets. The recession has led to renewed interest by economists in the relationships between balance sheets and economic activity.[10]

In the United Kingdom and the United States, the rapid growth in real estate prices during the "housing bubble" from 2001 to 2006 was associated with lower household saving and growth in household debt. For example, by 2007 net saving of households and NPISH was 3.2% of net disposable income in the United States and even negative, -3.7% of net disposable income, in the United Kingdom. Denmark and Ireland, which also experienced real estate bubbles, also exhibited negative household net saving in 2007. By 2009, illustrating the major change in prospects for the future, the household saving rates in these countries had increased – by more than 3 percentage points in the United States (to 6.4%), by nearly 6 percentage points in the United Kingdom (to 2.3%), by 4 percentage points in Denmark, and by 12 percentage points in Ireland. The increase in household net saving was reflected in weakness in the household consumption component of GDP final expenditures for these countries.

These effects on net saving were less pronounced in countries that had not participated in the boom in real estate prices. There was essentially no increase in the household saving rate in Germany or Italy, and increases of only about one percentage point in Japan and France.

The notable increase in saving in the United Kingdom and the United States was also reflected on the household balance sheet as deleveraging – that is, as reductions in household debt. In the United Kingdom, household debt as a percentage of net disposable income fell from 179.8 to 167.9 from 2007 to 2009 (See Figure 13.6). Over the same period, the household debt ratio in the United States fell from 142.8 to 133.3. This downturn in household debt, however, was primarily associated with countries that had experienced the real estate bubble. As shown in Figure 13.6, during the Great Recessions the household debt ratios of Japan and Germany continued their downward trends, while those of France and Italy continued their upward trends, with little evidence of a notable impact from the recession.

During the Great Recession, the net lending of general government decreased (or net borrowing increased) for almost all OECD countries. Of

Figure 13.6. **Debt of Households as a Percentage of Net Disposable Income, Selected Countries (2001-12)**
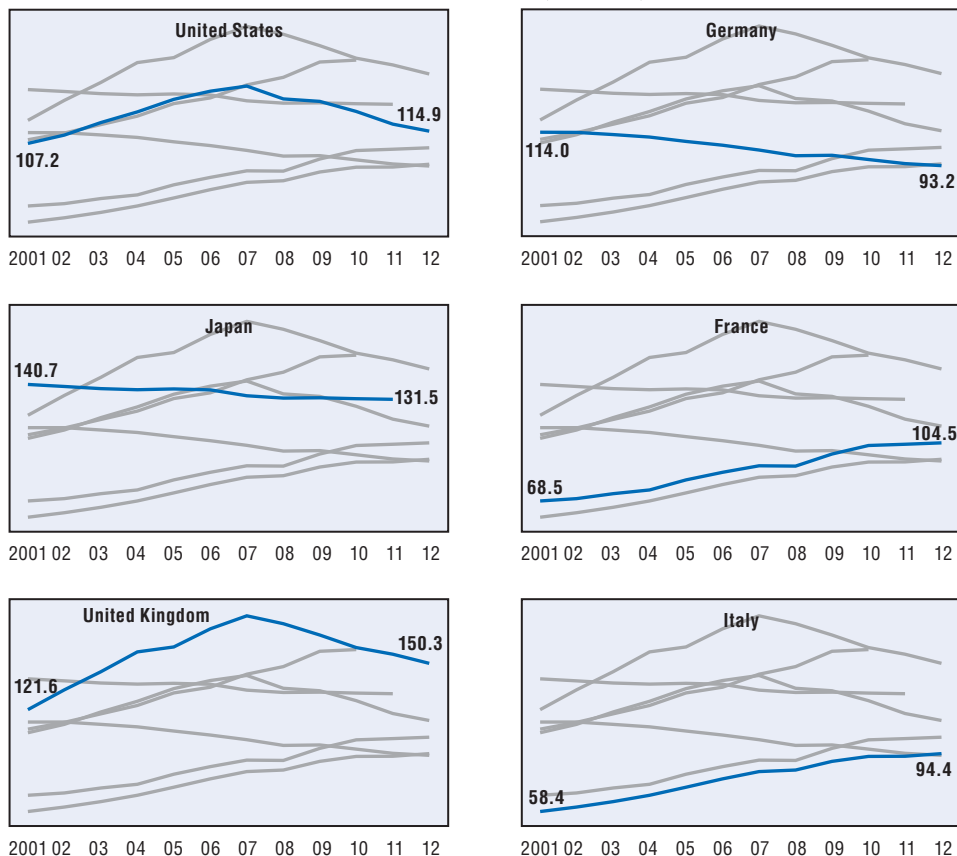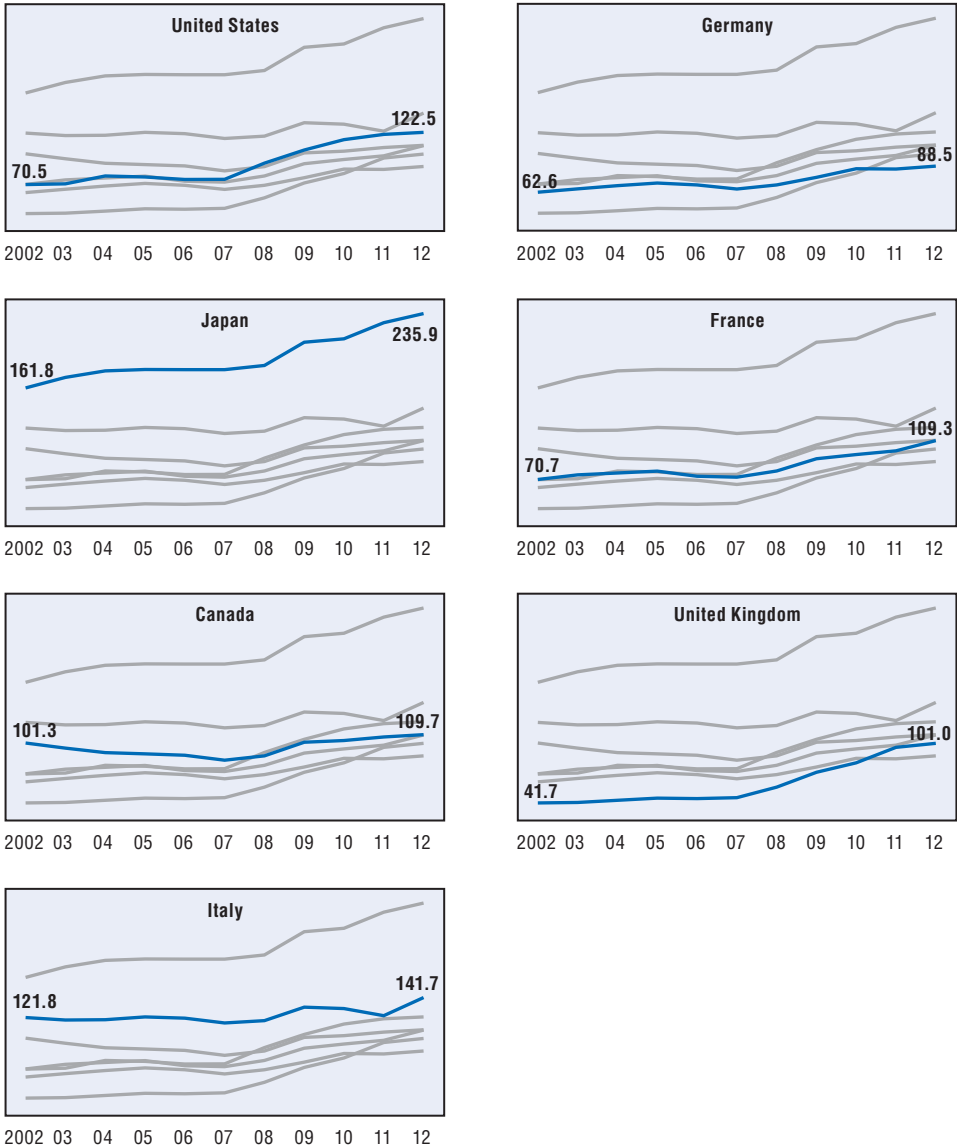

Source: OECD (2014), "National Accounts at a Glance: National Accounts at a Glance", OECD National Accounts Statistics (database), doi: *http://dx.doi.org/10.1787/data-00369-en*.

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course, there were many recession-related economic factors that would have automatically contributed to this decrease in the fiscal balance, such as the reduction in tax receipts as economic activity and incomes declined and the automatic increases in expenditures for various social benefits, such as unemployment insurance. Furthermore, a number of countries undertook expansionary fiscal programmes, such as the American Recovery and Reinvestment Act of 2009 in the United States and various car scrappage ("cash for clunkers") programmes in various OECD countries. From 2007 to 2009, net borrowing as a percentage of GDP increased by 9 percentage points (from 3.6% to 12.7%) in the United States, by 8 percentage points in the United Kingdom, by 6 percentage points in Japan, and by more than 4 percentage points in the Euro area.

Along with the reduction in net lending (or increase in net borrowing), from 2007 to 2009 the debt of general government as a percentage of GDP increased in almost all OECD countries, (see Figure 13.7). In some cases, the

Figure 13.7. **Debt of General Government as a Percentage of GDP, G7 Countries (2002-12)**

Source: OECD (2014), "National Accounts at a Glance: National Accounts at a Glance", OECD National Accounts Statistics (database), doi: *http://dx.doi.org/10.1787/data-00369-en.*

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increases in the general government debt ratio during the recession were quite large – for example, from 2007 to 2009 the US ratio increased 29 percentage points (from 75.8% to 105.0%), and the UK ratio increased 25 percentage points (from 47.0% to 72.1%). Many other countries also had increases in the debt ratio of 10 percentage points or more. Box 13.3 explains the difficulty in comparing levels of government debt between OECD countries.

Box 13.3. **Measuring and comparing public debt**

Public debt as a percentage of GDP is a headline indicator. But there are many ways (i.e. conventions) to measure the numerator of this ratio. All of them will more or less show the same "story" of the debt increasing more than GDP during the recent period, similarly to what is shown by Figure 13.7. Thus, in terms of changes in debt, all measurement conventions will tend to give the same message. But Figure 13.7 can also be used to compare debt levels between countries. This is where the convention chosen can dramatically change the picture. Some conventions do not allow good international comparability. Figure 13.7 is one of them despite the fact that it reflects total liabilities of general government as reported in OECD statistical databases.

Consolidation

Generally, the public debt of the general government is shown consolidated. This means that if one unit of the government owes debt to another unit of the government, this is not counted in the overall public debt. Indeed, this debt is internal to the government. This convention is widely implemented and Figure 13.7 shows consolidated debt for all countries, except Japan, which does not transmit consolidated figures to the OECD. Thus while comparability with respect to consolidation is ensured for other countries, it is not the case for Japan which levels of debt are systematically overestimated in Figure 13.7 compared to other countries (by between 8% in 2002 to 17% in 2012).

Netting assets

Figure 13.7 shows gross debt. This means it reflects all the liabilities owed by the general government without taking into account the assets that the government may dispose of. For example, government may issue bonds on the financial markets in order to lend to banks. In this case, this borrowing increases the gross debt, but one could consider that it does not increase the net debt, as the government has an asset (the loan to the banks) which is the counterpart of the bonds. Most common figures of public debt are gross ones (in particular the Maastricht debt), but the OECD also publishes a figure of net debt, which is equal to the gross debt minus all financial assets owned by the general government. This reduces the level of public debt, and may change the relative level of public debt between countries. Economists are split between those in favour of monitoring gross debt and those in favour of monitoring net debt.

Box 13.3. **Measuring and comparing public debt** (*cont.*)

Coverage of debt instruments

Figure 13.7 shows the widest convention for measuring public debt. It reflects the total of all gross liabilities of the general government as recorded in the national accounts. This covers liabilities in: currency and deposits (F2), bonds (F3-which constitute the core of public debt), loans (F4), pension liabilities (F6), and payables (F8*). The international comparability of this measure is problematic, essentially because of the recording of pension liabilities of government employees. In non-European OECD countries, such as the United States, Australia or Canada, national accounts include an estimate of the obligation of the government in terms of the future pensions of its employees. In EU countries, the national accounts do not include this amount. This is a very substantial amount, representing around 14% of GDP in Canada in 2012, and 20% in the United States In terms of level of debt, the convention used in Figure 13.7 is therefore fraught with non-comparability as it includes these amounts for Canada and United States, but not for France, Germany, Italy, Japan and UK, even though there are such pension obligations in these countries, but which are not recorded in the national accounts.

Maastricht convention

In the EU, the Stability and Growth Pact, a cornerstone of the fiscal monitoring of EU member states, uses a convention which is even more restrictive. The financial instruments that are included are only F2 (currency and deposits), F3 (bonds) and F4 (loans). This excludes F8 (payables) in addition to the exclusion of F6 (pension liabilities) already discussed above. The Maastricht debt uses also a valuation of debt at so-called "face" value, while other valuations are at "nominal" value (which means including interest accrued but not paid) or even, which is the theory in national accounts, at "market value" (bonds are revalued as if they were exchanged on secondary markets). However, only few countries apply thoroughly the valuation at market value for public debt in their national accounts.

Table 13.3 gives an indication on the impact of these differing conventions on the level of debt for a sample of three countries. As can be seen, the order of ranking in terms of debt level changes dramatically depending on the convention used. In particular, the situation of Canada appears much better when using more comparable data. In fact, *OECD's Economic Outlook* does not publish the data corresponding to Figure 13.7, as it is considered not comparable enough.

* F7 in SNA 1993
Source: OECD (2014), "Financial Balance Sheets: Consolidated stocks, annual", OECD National Accounts Statistics (database), doi: *http://dx.doi.org/10.1787/data-00024-en.*

Box 13.3. **Measuring and comparing public debt** (*cont.*)

Table 13.3. **Effects of different conventions on level of debt**

2012, in percentage of GDP	United States	Canada	France
(1) Gross total liabilities (Figure 13.7)	122.5	109.7	109.3
(2) Gross debt excluding pension liabilities (line 1 – F6)	102.1	96.1	109.3
(3) Maastricht debt (line 2 – F8; at face value) [*]	94.2	72.9	90.2
(4) Net debt excluding pension liabilities (line 2 – financial assets)	80.0	43.6	70.3

[*] Estimate by OECD for USA and Canada.

Source: OECD (2014), National Accounts at a Glance: National Accounts at a Glance, OECD National Accounts Statistics (database), doi: *http://dx.doi.org/10.1787/data-00369-en*

2. Slow economic recovery

After reaching a trough in the first half of 2009, the advanced economies began growing again, but in most countries the growth was slow and erratic (see the final column of Table 13.1). Over the 4½ years from the trough of the Great Recession through the third quarter of 2013, real GDP of the OECD in aggregate increased 9.0%, or at an average annual rate of 1.9%.

In many European countries, the recovery from the Great Recession was interrupted by economic downturns due to the sovereign debt crisis and the related banking crisis in the Euro area. For example, the Euro area experienced a gradual recovery over the first two years after the trough, and its real GDP had increased 4.0% by the third quarter of 2011. Then much of Europe entered another recession, with GDP for the Euro area decreasing 1.5% over the next six quarters. After the first quarter of 2013, Euro area GDP resumed gradual growth.

Aggregate averages, however, hide a great deal of variation in the experiences of various countries; within the Euro area, there have been large differences between countries. Greece, at the center of the Euro area crisis, has, unfortunately, experienced the largest and most continuous recession in the world, with an estimated 25% decrease in real GDP between the last quarter of 2007 and the last quarter of 2013. Portugal's GDP began declining again in the fourth quarter of 2010 and had decreased 7.0% by the first quarter of 2013. Rather than recovering from the Great Recession, from the trough in 2009 through the fourth quarter of 2013, Portugal's real GDP decreased 2.8%. Italy's GDP began to decline in the third quarter of 2011, and by the third quarter of 2013 it had decreased 4.9%. As of the fourth quarter of 2013, Italy's real GDP was 2.0% below its 2009 trough. Spain's GDP began declining in the

second quarter of 2011 and fell 3.3% by the second quarter of 2013. From the 2009 trough through the fourth quarter of 2013, Spain's GDP had decreased 2.3%.

At the other end of the spectrum within Europe, over 19 quarters from the end of the Great Recession, Poland's GDP grew 14.2%, a 2.8% annual rate, and the Slovak Republic's GDP grew 13.4%, a 2.7% annual rate. The largest economy of the Euro area, Germany, also experienced relatively solid growth, with its real GDP growing 10.5%, a 2.1% annual rate. On the other hand, France's GDP grew only 4.6% (a 1.0% annual rate), and GDP of the Netherlands grew only 2.0% (a 0.4% annual rate). The United Kingdom, which is not part of the Euro area, also experienced a downturn for three quarters in 2011-2012 and overall modest growth since the 2009 trough of 6.3% (a 1.5% annual rate).

In North America, the recovery proceeded at a slow, but relatively steady pace. US GDP increased 11.2% since the 2009 trough, a 2.4% annual rate, and experienced only one quarter of decrease (in the first quarter of 2011). Canada's GDP increased at a 2.5% annual rate, and Mexico's increased at a 3.8% annual rate. In Northeast Asia, Japan's GDP experienced two periods of downturn, a drop of 2.4% over the first two quarters of 2011, and another decline of 1.3% over the first three quarters of 2012. Overall, Japan's GDP grew 9.9% (a 2.0% annual rate) from its trough in 2009 through the fourth quarter of 2013. Korea, on the other hand, experienced relatively uninterrupted growth of 21.8%, a 4.0% annual rate.

In terms of GDP final expenditures, growth in exports was the main driver of recovery in most OECD countries. Contrary to what happened after the depression of 1929, policy makers did not fall into the trap of anti-globalisation policies. For the OECD countries in aggregate, real exports increased 28.7% from the trough of the recession in the first quarter of 2009 through the third quarter of 2013, a 5.8% average annual growth rate (see Figure 13.3). Imports increased 22.8%, a 4.7% growth rate, over the same span. In contrast to most economic recoveries, however, the recovery in gross fixed capital formation was unusually weak. Since the 2009 trough in GDP, real gross fixed capital formation increased only 6.3%, a 1.4% annual rate, and remained 7.0% below its level in the first quarter of 2008, when GDP for the OECD countries was at its pre-recession peak. Private final consumption expenditure grew, but more slowly than GDP (7.6%, a 1.6% annual rate) as consumers in several countries continued to deleverage. General government final consumption expenditure grew during the first four quarters of the recovery, but after the second quarter of 2010 it began to contract as many countries began to institute austerity measures in response to the expansion in general government debt. By the third quarter of 2013, general government final consumption expenditure was only 2.4% above its level at the trough of the Great Recession.

Government debt and deficit were perhaps the mostly hotly debated economic policy issues during the recovery. Despite austerity measures that included cuts in social benefits and tax increases, government debt continued to rise in many OECD countries as slow economic growth constrained the recovery in government receipts. From 2009 to 2012, debt as a percentage of GDP increased in all of the G7 countries by amounts ranging from 29 percentage points in the United Kingdom to 8 percentage points in Canada (see Figure 13.7).

3. Prelude to the financial crisis

We've seen that the national accounts provide us with a statistical account of the Great Recession and the subsequent slow recovery. To what extent do the national accounts also provide us with an account of the imbalances that led to the global financial crisis? This turns out to be a question of some interest, as analysts have noted that the national accounts had both successes and failures in identifying the critical imbalances.

This is an opportunity to remind users of national accounts that it is unfortunately not possible to find a housing price index directly from the national accounts tables. Indeed, while revaluations include the impact of the change in the price of old dwellings on the value of households assets, it does not include information on the volume of the stock of old dwellings. It would be interesting for national accounts users that such a housing price index is included in the standard national accounts tables.

The real estate bubble that affected the United States was visible in the balance sheets of the US integrated macroeconomic accounts, as seen in Figure 13.8. From 2001 to 2006, real estate assets owned by households increased 67.6%.[11] The increase primarily reflected revaluation due to rising real estate prices, though housing construction also contributed to the increase. The effects of the subsequent crash in real estate prices are also apparent, with the value of household real estate assets dropping 27.4% from 2006 to 2011. The increase in household leverage is also apparent, as US households became net borrowers during the years of the real estate boom. This was also the case in Ireland and Spain, two other countries strongly affected by a housing bubble.

Although in principle, the national accounts should be able to tell similar stories for all of the countries that experienced a real estate bubble, in practice we are limited by the lack of complete nonfinancial balance sheets for many countries. In a 2009 report to the G20 finance ministers and central bank

Figure 13.8. **Real estate assets of households and NPISH,
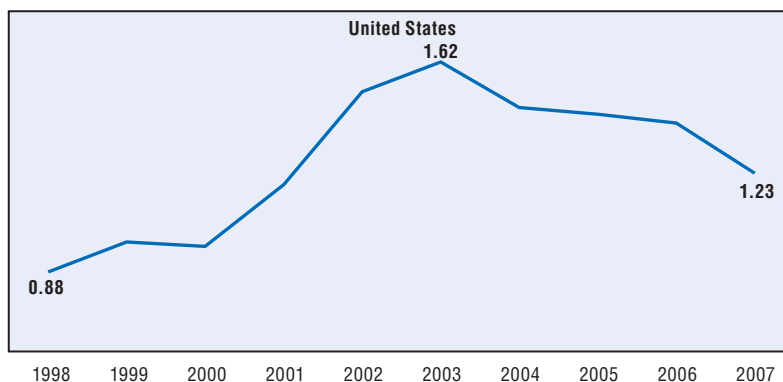United States (2001-12)**

Billion of US dollars
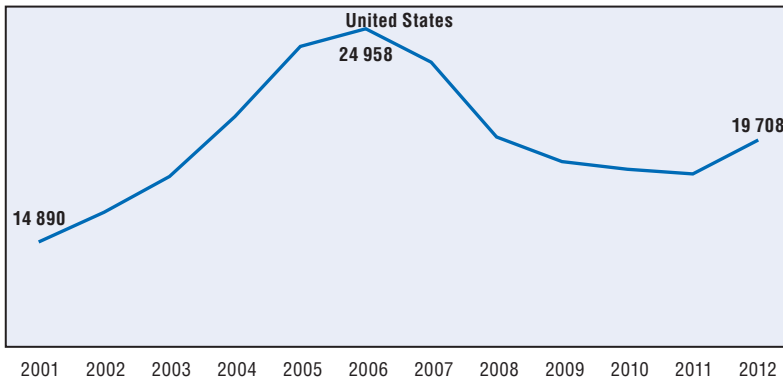
Source: Integrated Macroeconomic accounts of the United States, table S.3.a, from Bureau of Economic Analysis, *www.bea.gov/national/sna.htm*.

StatLink ⟶ *http://dx.doi.org/10.1787/888933144309*

governors, the IMF staff and Financial Stability Board Secretariat concluded, "The crisis has weaknesses in the availability of some sectoral and other financial economic databases." It recommended "a strategy to promote the compilation and dissemination of the [balance sheet approach], flow of funds, and sectoral data more generally."[12]

In 2009, Michael Palumbo and Jonathan Parker wrote an interesting critique of the effectiveness of the US integrated macroeconomic accounts in identifying macroeconomic imbalances in the years leading up to the financial crisis.[13] While they found that the SNA data correctly identified the increased leverage and borrowing of the household sector, primarily with mortgages, they also found that the rise in the aggregate home loan-to-value ratio was relatively small. From other sources, they were aware that many mortgages were initiated with little down payment and extremely high leverage, but this effect was not apparent in the home loan-to-value ratio because rising real estate prices greatly boosted the denominator of this aggregate ratio. However, as Takashi Yamashita pointed out, another measure of growth in leverage can be constructed from the flow data, the ratio of the household sector's net incurrence of mortgage debt to gross residential fixed capital formation, which is shown for the United States in Figure 13.9.[14] If mortgage debt was incurred to purchase newly constructed dwellings, this ratio would indicate the typical mortgage share of financing of new home purchases. However, in the United States much mortgage debt is incurred through refinancing, and refinancing often allows the homeowner to take cash out (that is, refinance with a larger mortgage than the previous one, with

Figure 13.9. **Ratio of net incurrence of mortgages to residential gross fixed capital formation, Households and NPISH, United States (1998-2007)**

Source: Integrated Macroeconomic accounts of the United States, table S.3.a, from Bureau of Economic Analysis, *www.bea.gov/national/sna.htm.*

StatLink ᴴᴸᴾ *http://dx.doi.org/10.1787/888933144312*

the difference reflecting a cash payment to the homeowner). Cash-out refinancing can thus be used to fund household consumption expenditures and was regarded as a contributor to the high levels of household consumption and low levels of saving during the housing bubble. This ratio moved above 1.0 in 2001 and remained above 1.4 during the real estate bubble of 2002 through 2006, as cash-out mortgage re-financing allowed consumers to increase spending and reduce their saving. The unusually high level of this ratio was indicative of the high level of exposure of mortgage borrowers to volatility in real estate prices. It peaked in 2003, as gross residential fixed capital formation (the denominator of the ratio) grew rapidly during the last years of the real estate bubble.

The inability of the national accounts to identify subsets of households that were highly leveraged or otherwise under financial duress has led to efforts to develop data on the distribution of income and of consumption that are consistent with the more aggregated national accounts data. The Commission on the Measurement of Economic Performance and Social Progress, chaired by Joseph Stiglitz, Amartya Sen, and Jean-Paul Fitoussi, recommended giving more prominence to the distribution of income, consumption, and wealth, and the OECD has formed an Expert Group on Disparities in National Accounts. This was also one of the recommendations by the IMF and the Financial Stability Board in their report to the G20 finance ministers on data gaps.

Palumbo and Parker were also critical of the capability of the US integrated macroeconomic accounts to identify the financial sector's "rise in exposure to the housing market as well as increases in leverage, balance sheet

complexity, maturity mismatch, and counterparty risk-taking," factors that they saw as critical in the spreading of the real estate market shocks to financial institutions and to the real economy.[15] In particular, they noted that two factors made it difficult to see the increased exposure of the financial sector to real estate price shocks. First, the SNA's aggregation across asset classes did not distinguish different types of bonds and collateralised debt obligations, some of which carried much more risk than traditional corporate bonds. The growing importance of securitization resulted in exposures to mortgage debt that couldn't be identified from aggregate SNA financial account and balance sheet data. Second, aggregation of financial corporations made it difficult to identify the high levels of leverage of certain financial institutions, such as investment banks, broker/dealers, and, in the United States, government-sponsored enterprises such as Fannie Mae and Freddie Mac. Because the financial corporations sector mixes high leverage institutions with other institutions that carry very little leverage, such as mutual funds, pension funds, and insurance companies, the financial sector as a whole showed only a modest increase in balance sheet leverage during the credit boom.

To some extent, the issue of excessive aggregation is already addressed within the SNA through its ability to disaggregate into smaller subsectors and financial instruments. Furthermore, the data gaps initiative of the IMF and the Financial Stability Board includes several concrete recommendations to better monitor risk and share information. Nevertheless, aggregated information will probably always face the criticism that the process of aggregation hides or disguises important risks, which implies that macroeconomic statistics will never fully substitute for the monitoring of institution and asset-specific risks. The measurement community, however, continues to conduct research on developing improved measures of risk and integrating that information with the national accounts.[16]

Another set of imbalances that has received considerable attention is the external balances, as summarised by the current and financial accounts. For several countries that experienced housing bubbles, including the United States, Spain, and Ireland, the countries became significant net borrowers prior to the Great Recession. We should also note, however, that some countries that fared poorly did not experience large swings in the current or financial account balances, and that other countries that fared relatively well, such as Poland, were net borrowers during that period.

In conclusion, although the national accounts were not able to capture all of the imbalances that developed during the 2000s prior to the financial crisis and the Great Recession, they were very useful for identifying a number of the most important imbalances. Furthermore, continuing work such as the G20 data gaps initiative and other efforts to add distributional and risk

information to the national accounting framework should lead to improved performance in the future. Furthermore, in tracking the economic activity, income, saving, and balance sheets during and after the Great Recession, the national accounts were indispensable.

Notes

1. See Isidore, 2007 and Bernanke, 2007.

2. See Federal Reserve Bank of St. Louis, 2008 and Johnson, 2008.

3. For example, Schiller, 2008; Reinhart and Rogoff, 2009; Lowenstein, 2010; Johnson and Kwok, 2010; Lewis, 2011; Rajan, 2011; Gorton, 2012.

4. Except where specifically noted otherwise, the source of all of the statistical data cited in this chapter is the OECD Stat Extracts database, and in most cases they reflect the data that were available on February 24, 2014.

5. Source: Australian bureau of statistics (2013): Australian system of National Accounts, *www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5204.02012-13?OpenDocument.*

6. The data cited in this paragraph are from the national accounts databases shown on the Eurostat and Bureau of Economic Analysis websites.

7. See, for example, Mankiw (2003), pp. 242-245.

8. Source: National accounts database, NIPA Table 1.8.6, Bureau of Economic Analysis website.

9. For example, see Hamilton, 2009: 215-261.

10. For example, see Mian and al, 2010: 74-11 6 and Dynan, 2012: 299-34 4.

11. Source: Integrated macroeconomic accounts of the United States, table S.3.a, Bureau of Economic Analysis website.

12. See IMF and al., 2009.

13. See Palumbo and al. 2009: 80-86 ; Eichner and al. 2010.

14. See Yamashita, 2013.

15. See Palumbo and al. 2009b. 80-86.

16. See Hulten and al., forthcoming.

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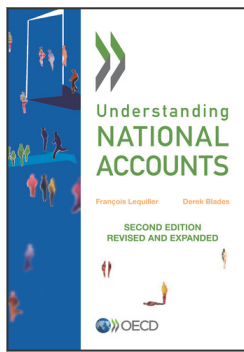
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