Part 1

Costs and benefits of monetary union

1

The costs of a common currency

Introduction

The costs of a monetary union derive from the fact that when a country relinquishes its national currency, it also relinquishes an instrument of economic policy, i.e. it loses the abil-ity to conduct a national monetary policy. In other words, in a full monetary union the national central bank either ceases to exist or will have no real power. This implies that a nation joining a monetary union will no longer be able to change the price of its currency (by devaluations and revaluations), to determine the quantity of the national money in circulation, or to change the short-term interest rate.

One may raise the issue here of what good it does for a nation to be able to conduct an independent monetary policy (including changing the price of its currency). There are many situations in which these policies can be very useful for an individual nation. The exchange rate is useful as a policy instrument, for example, because nations are different in some important senses, requiring changes in the exchange rate to occur. In section 1.1 we analyse some of the differences that may require exchange rate adjustments. In later sections we analyse how the loss of monetary independence may be costly in some other ways for an individual nation, in particular in the way government budget deficits can be financed.

The analysis that follows in this chapter is known as the 'theory of optimum currency areas'. This theory, which was pioneered by Mundell (1961),

McKinnon (1963), and Kenen (1969), has concentrated on the cost side of the cost–benefit analysis of a monetary union.¹

1.1 Shifts in demand (Mundell)

Consider the case of a demand shift developed by Mundell (1961) in his celebrated article on optimum currency areas. Let us suppose first that two countries, which we call France and Germany, form a monetary union. By that we mean that they have abandoned their national currencies and use a common currency, the euro, which is managed by a common central bank, the European Central Bank. Let us assume further that for some reason consumers shift their preferences away from French-made to German-made products. We present the effects of this asymmetric shock in aggregate demand in Fig. 1.1.

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Figure 1.1 Aggregate demand and supply in France and Germany.

The curves in Fig. 1.1 are the standard aggregate demand and supply curves in an open economy seen in most macroeconomics textbooks.² The demand curve is the negatively sloped line indicating that when the domestic price level increases the demand for the domestic output declines.³

The supply curve expresses the idea that when the price of the domestic output increases, domestic firms, in a competitive environment, will increase

3 This is the substitution effect of a price increase. In the standard aggregate demand analysis, there is also a monetary effect: when the domestic price level increases, the stock of real cash balances declines, leading to an upward movement in the domestic real interest rate. This in turn reduces aggregate demand (see De Grauwe 1983). Here we disregard the monetary effect and concentrate on the substitution effect.

¹ For surveys of this literature, see Ishiyama (1975); Tower and Willett (1976); and Mongelli (2002).

² See Krugman and Wells (2005); Mankiw (2006); or Blanchard (2008).

their supply in order to profit from the higher price. In addition, each supply curve is drawn under the assumption that the nominal wage rate and the prices of other inputs (e.g. energy, imported inputs) remain constant. Changes in the prices of these inputs will shift these supply curves.

The demand shift is represented by an upward movement of the demand curve in Germany, and a downward movement in France. As will be discussed later, it will be important to know whether these demand shifts are permanent or temporary. For the moment we assume that these shifts are permanent, for example due to a change in consumer preferences. The result of these demand shifts, then, is that output declines in France and increases in Germany. This will most likely lead to additional unemployment in France and a decline in unemployment in Germany.

Both countries will have an adjustment problem. France is plagued with reduced output and higher unemployment. Germany experiences a boom, which also leads to upward pressures on its price level. The question that arises is whether there is a mechanism that leads to automatic equilibration.

The answer is positive. There are two mechanisms that will automatically bring back equilibrium in the two countries. One is based on wage flexibility, the other on the mobility of labour.

1. *Wage flexibility*. If wages in France and Germany are flexible the following will happen. French workers who are unemployed will reduce their wage claims. In Germany, the excess demand for labour will push up the wage rate. The effect of this adjustment mechanism is shown in Fig. 1.2. The reduction of the wage rate in France shifts the aggregate supply curve downwards, whereas the wage increases in Germany shift the aggregate supply curve upwards. These shifts lead to a new equilibrium. In France, the price of output declines, making French products more competitive, and stimulating demand. The opposite occurs in Germany.

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Figure 1.2 The automatic adjustment process.

Two comments should be made here about this adjustment mechanism. First, there are second-order effects on aggregate demand that will reinforce the equilibrating mechanism. The wage and price increases in Germany make French products more competitive. This leads to an upward shift in the French aggregate demand curve. Similarly, the decline in French costs and prices makes German products less competitive and shifts the German aggregate demand curve downwards.

Second, a wage decline in France also implies that French workers see their real income decline. This is likely to lead to less demand for goods and services. As a result of this income effect of a wage decline, the positive competitiveness effect of the same wage decline may be offset by further downward shifts of the demand curve. We will return to this issue, as this matters for the way countries adjust to an asymmetric shock.

2. *Mobility of labour*. A second mechanism that will lead to a new equilibrium involves mobility of labour. The French unemployed workers move to Germany, where there is excess demand for labour. This movement of labour eliminates the need to let wages decline in France and increase in Germany. Thus, the French unemployment problem disappears, whereas the inflationary wage pressures in Germany vanish.

Thus, in principle the adjustment problem for France and Germany will disappear automatically if wages are flexible, and/or if the mobility of labour between the two countries is sufficiently high. If these conditions are not satisfied, however, the adjustment problem will not vanish. Suppose, for example, that wages in France do not decline despite the unemployment situation, and that French workers do not move to Germany. In that case France is stuck in the disequilibrium situation depicted in Fig. 1.1. In Germany, the excess demand for labour puts upward pressure on the wage rate, producing an upward shift of the supply curve. The adjustment to the disequilibrium must now come exclusively through price increases in Germany. These German price increases make French goods more competitive again, leading to an upward shift in the aggregate demand curve in France. Thus, if wages do not decline in France the adjustment to the disequilibrium will take the form of inflation in Germany.

What would have happened if the two countries had not been in a monetary union? In that case they would have been free to use their national monetary policy tools to adjust to the asymmetric shocks. There are several ways in which countries that maintain their monetary independence can use their monetary policy instruments. We distinguish two methods here that are related to the exchange rate regime that countries use. In a first regime, these countries keep their exchange rates flexible, very much as the USA, the UK, and Japan are doing. In that case, they can change their monetary policies (through changes in the domestic interest rate and/or the money supply) to achieve a particular objective. In a second regime, countries peg their exchange rates to another currency, e.g. Denmark to the euro, or several Latin American countries to the dollar. In this case they can devalue or revalue their currencies.

Suppose first that France and Germany had chosen a flexible exchange rate regime. In that case, France could have lowered its interest rate, thereby stimulating aggregate demand, while Germany could have raised its interest rate, thereby reducing aggregate demand. These monetary policies conducted by France and Germany would likely have led to a depreciation of the French franc and an appreciation of the German mark, thereby making the French products sold in Germany cheaper. Both the interest rate and exchange rate changes would have tended to boost aggregate demand in France and to lower aggregate demand in Germany.

If France and Germany had chosen to peg their exchange rate, France would have been able to devalue the franc against the mark, thereby achieving similar effects on aggregate demand. The devaluation of the franc would have increased the competitiveness of the French products, thereby stimulating the demand coming from Germany.

The effects of these national monetary policies are shown in Fig. 1.3. The expansionary monetary policy in France (or in the second regime, the devaluation of the French franc) shifts the French aggregate demand curve upwards. In Germany, the opposite occurs. The restrictive monetary policy in Germany (the appreciation of the mark) reduces aggregate demand in Germany, so that the demand curve shifts back to the left.

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Figure 1.3 Effects of monetary expansion in France and monetary restriction in Germany.

The effects of these demand shifts are that France solves its unemployment problem and Germany avoids having to accept inflationary pressures. This remarkable feat is achieved using just one instrument. (The reader may sense that this is too good to be true. And indeed it is. However, for the moment we just present Mundell's theory. We come back with criticism in Chapter 2.)

In contrast, when France is part of a monetary union with Germany it relinquishes control over its monetary policy. If it is saddled with a sustained unemployment problem, that can only disappear as a result of deflation (a price decline) in France. In this sense, we can say that a monetary union has a cost for France when it is faced with a negative demand shock. Similarly, Germany will find it costly to be in a monetary union with France, because it will have to accept more inflation than it would like.

Let us recapitulate the main points developed in this section. If wages are rigid and if labour mobility is limited, countries that form a monetary union will find it harder to adjust to asymmetric demand shifts than countries that have maintained their own national money and that can devalue (revalue) their currency. (In BOX 1.1, we analyse whether this conclusion holds when demand shocks are symmetric.) In the case of countries that have kept their own money, national monetary policies, including the exchange rate, add some flexibility to a system that is overly rigid. Put differently, a monetary union between two or more countries is optimal if one of the following conditions is satisfied: (*a*) there is sufficient wage flexibility; (*b*) there is sufficient mobility of labour.

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Box 1.1 Symmetric and asymmetric shocks compared

We have seen that the occurrence of asymmetric shocks creates costs of adjustment in a monetary union if there is a lack of flexibility in the labour markets. Things are very different when symmetric shocks occur. We illustrate this using the same two-country model of aggregate demand and supply as in Fig. 1.1. We now assume that the demand shocks are symmetric. More specifically, we assume that in both France and Germany the demand curve shifts to the left in equal amounts. The result is shown in Fig. 1.4.

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Figure 1.4 Symmetric shocks.

Can France and Germany deal with this negative demand shock when they are in a monetary union? The answer is yes, at least in principle. In a monetary union, monetary policy is centralized in the hands of the union central bank. Call it the European Central Bank (ECB). In addition, in a monetary union there is only one interest rate as the money markets are perfectly integrated. The ECB can now lower the interest rate, thereby stimulating aggregate demand in both countries. This contrasts markedly with the case of asymmetric shocks. There the ECB will be pretty much paralysed, because it has only one instrument to deal with two problems. If it reduces the interest rate so as to stimulate aggregate demand in France, it increases inflationary pressure in Germany. If, on the other hand, it increases the interest rate so as to deal with the inflationary pressure in Germany, it reduces aggregate demand in France, and intensifies that country's problem.

It is also interesting to analyse what would happen if the two countries that face a symmetric shock were not in a monetary union. Would devaluation then be an attractive policy option? The answer is no. Suppose that France were to devalue. This would stimulate aggregate demand in France, at the expense of Germany. In France, the aggregate demand curve would shift to the right. The French devaluation would, however, shift the German aggregate demand curve further to the left. The French would essentially solve their problem by exporting it to Germany. It is likely that the latter would react. The danger of a spiral of devaluations and counter-devaluations would be real. In the end the effectiveness of changing the exchange rate would be greatly reduced. In order to avoid such a spiral the two countries would have to coordinate their actions, which is difficult among independent nations. In a monetary union, by contrast, this monetary cooperation is institutionalized. We conclude that a monetary union is a more attractive monetary regime than a regime of independent monetary authorities if shocks that hit the countries are symmetric. When shocks are asymmetric, however, this advantage of a monetary union disappears.

It should be noted that we have assumed that the ECB can manipulate aggregate demand in the union. There are reasons to believe that the effectiveness of monetary policy in raising aggregate demand is limited. The same criticism, however, applies as far as the effectiveness of devaluations is concerned. When countries are independent and they use the exchange rate as an instrument to deal with asymmetric shocks, they face similar limitations on the effectiveness of exchange rate policies. We return to these issues in Chapter 2.

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1.2 Monetary independence and government budgets

When countries join a monetary union, they lose their monetary independence. As argued in section 1.1, that affects their capacity to deal with asymmetric shocks. This is the essence of the traditional theory of optimal currency areas as developed by Mundell (1961). This theory, however, is incomplete. It overlooks another major implication of the loss of monetary independence: the entry into a monetary union fundamentally changes the capacity of governments to finance their budget deficits. This is important, but surprisingly it was overlooked until the sovereign debt crisis in the Eurozone emerged in 2010. Let us develop this point further.⁴

Members of a monetary union issue debt in a currency over which they have no control. For example, when France, Germany, and Spain entered the Eurozone they ceased to issue their debt in their national currencies (the French franc, the German mark, and the Spanish peseta) over which they had full control. Instead, they now issue their debt in euros, a currency that none of these governments control. For each of these governments the euro is like a foreign currency. This has a profound implication. It implies that these governments cannot give an ironclad guarantee to the holders of government bonds that they

⁴ The following sections are based on De Grauwe (2011).

will have enough cash to pay them (the bondholders) out when the bonds come to maturity. This contrasts with a standalone country like the UK. The UK government can give a full guarantee to holders of UK government bonds that they will be paid out in pounds when the bonds mature. The reason is that there is a central bank, the Bank of England, that will be ready (or be forced) to provide liquidity (pounds) to the UK government if the latter were to face a liquidity shortage, which would prevent it from paying out bondholders. None of the governments of member countries of a monetary union have the power to force the common central bank to provide liquidity in times of crisis.

As is shown in the following paragraphs, the fact that governments of a monetary union cannot give a guarantee to the holders of the government bonds that they will always be paid out at maturity, implies that financial markets acquire the power to force default on these countries. This is not the case in countries that are not part of a monetary union, and that have kept control over the currency in which they issue debt. These countries cannot be forced into default by financial markets.

In order to show why this is so, we analyse in detail what happens when investors start to have doubts about the solvency of these two types of countries. We will use the UK as a prototype monetary 'stand-alone' country and Spain as a prototype member country of a monetary union.⁵

The UK scenario

Let's first trace what would happen if investors were to fear that the UK government might be defaulting on its debt. In that case, they would sell their UK government bonds, driving up the interest rate. After selling these bonds, these investors would have pounds that most probably they would want to get

⁵ See Kopf (2011) for an insightful analysis and Winkler (2011) for an interesting comparison with the US banking system of the nineteenth century.

rid of by selling them in the foreign exchange market. The price of the pound would drop until somebody else was willing to buy these cheap pounds. The effect of this mechanism is that the pounds would remain bottled up in the UK money market to be invested in UK assets. Put differently, the UK money stock would remain unchanged. Part of that stock of money would probably be reinvested in UK government securities. But even if that were not the case so that the UK government could not find the funds to roll over its debt at reasonable interest rates, it would certainly force the Bank of England to provide it with the cash to pay out bondholders. Thus the UK government is ensured that the liquidity is around to fund its debt. This means that investors cannot precipitate a liquidity crisis in the UK that could force the UK government into default. There is a superior force of last resort, the Bank of England.

The Spanish scenario

Things are dramatically different for a member of a monetary union such as Spain. Suppose investors fear a default by the Spanish government. As a result, they sell Spanish government bonds, raising the interest rate. So far, we have the same effects as in the case of the UK. The rest is very different. The investors who have acquired euros are likely to decide to invest these euros elsewhere, say in German government bonds. As a result, the euros leave the Spanish banking system. There is no foreign exchange market and flexible exchange rate to stop this. Thus, the total amount of liquidity (money supply) in Spain shrinks. The Spanish government experiences a liquidity crisis, i.e. it cannot obtain funds to roll over its debt at reasonable interest rates. In addition, the Spanish government cannot force the Bank of Spain to provide the cash because the Bank of Spain does not have the authority to do this any more. The common central bank (the ECB in the Eurozone) can provide all the liquidity in the world, but the Spanish government does not control that institution. The liquidity crisis, if strong enough, can force the Spanish government into default because it cannot find the cash to pay out the bondholders. Financial markets know this and will test the Spanish government when budget deficits deteriorate. Thus, in a monetary union, financial markets acquire tremendous power and can force any member country onto its knees. This is quite paradoxical: a monetary union does not strengthen the position of national governments vis-à-vis financial markets; on the contrary, national governments in a monetary union lose power when confronted with financial markets.

The situation of Spain is reminiscent of the situation of emerging economies that have to borrow in a foreign currency. These emerging economies face the same problem, i.e. they can be confronted with a 'sudden stop' when capital inflows suddenly stop, leading to a liquidity crisis (see Calvo 1988 and Eichengreen et al. 2005).

The previous analysis stresses the fragility of a monetary union. When investors distrust a particular member government they will sell the bonds, thereby raising the interest rate and triggering a *liquidity* crisis. This may in turn set in motion a *solvency* problem, i.e. with a higher interest rate the government debt burden increases, forcing the government to reduce spending and increase taxation. Such forced budgetary austerity is politically costly, and in turn may lead the government to stop servicing the debt, and to declare a default. Thus, by entering a monetary union, member countries become vulnerable to movements of distrust by investors. Note that there is a self-fulfilling prophecy in these dynamics. When financial markets start distrusting a particular government's ability (or willingness) to service its debt, investors sell the government bonds, making it more likely that the government will stop servicing the debt. We come back to this feature of government debt crises in Chapter 5.

Note also that these dynamics are absent in countries that have kept their monetary independence. The reason is that these 'stand-alone' countries issue their debt in their own currencies. These countries, therefore, can always create the liquidity to pay out the bondholders. This does not mean, of course, that these countries may not have problems of their own. One could be that the tooeasy capacity to finance debt by money creation leads to inflation. But it remains true that these countries cannot be forced against their will into default by financial markets. The fact that this is possible in a monetary union makes such a union fragile and costly.

There is an important interaction between the fragility of a monetary union and asymmetric shocks. We discuss this interaction in section 1.3.

1.3 Asymmetric shocks and debt dynamics

Let us return to the two-country model presented in section 1.1. We discussed the adjustment problem France and Germany face in a monetary union when they are hit by an asymmetric demand shock. How is this adjustment affected when we take into account the budgetary implications? Let us first concentrate on France. As a result of the negative demand shock, output and employment decline in France. The effects on the French government budget are the following. First, the decline of French gross domestic product (GDP) leads to a decline of government tax receipts. This decline is probably more than proportional to the decline in GDP because income taxes are progressive. Second, because unemployment increases, the French government expenditures increase. When adding up these two effects we conclude that the French government budget deficit increases. This increase follows automatically from the decline in GDP. It is inherent in the government budget.

If the decline in aggregate demand is strong enough, the ensuing automatic increase in the French government budget deficit can become so large that investors start having doubts about the solvency of the French government. Let us go through the scenario that we developed for Spain in section 1.2 and apply it to France. Distrust in the French government will lead investors to sell French

government bonds, leading in turn to an increase in the interest rate and a liquidity crisis. The macroeconomic implications of this crisis are that the aggregate demand curve in France shifts further to the left, i.e. with a higher interest rate in France, French residents will spend less on consumption and investment goods. We show this effect in Fig. 1.5. The asymmetric demand shock shifts the demand curve from D_F to D'_F . This was the effect analysed in Fig. 1.1. The debt crisis now adds to the negative demand shock by further shifting the demand curve to D''_F . Thus, the debt crisis amplifies the initial negative demand shock.

<COMP: INSERT FIGURE 1.5 NEAR HERE>

Figure 1.5 Amplification of asymmetric shocks.

What is the effect of the French government debt crisis on Germany? In order to analyse this we go back to the moment that investors sell French government bonds. After these sales, investors acquire cash (call them euros) that they will want to invest. Presumably since they were holding (French) government bonds they will want to acquire other government bonds that they trust. In the present circumstances, these are likely to be German government bonds. So, let us assume that these investors buy German government bonds. The effect of these purchases is that the price of German government bonds increases. This in turn reduces the yield on these bonds. The effect of this liquidity flow (out of French bonds into German bonds) is that the interest rate in Germany declines. This will in turn increase aggregate demand in Germany. We show this effect in Fig. 1.5. The initial positive demand shock is now reinforced by an additional shift in the demand curve from D'_G to D''_G.

We conclude from this analysis that the debt crisis in France leads to an amplification of the asymmetric demand shock, amplifying the negative effects in France and amplifying the positive effects in Germany. This amplification effect occurs because the interest rate increases in France and declines in Germany. Thus, these interest rate changes, instead of stabilizing the system, tend to destabilize it. All this intensifies the adjustment problems of both countries.

The reader may be surprised that in this monetary union between France and Germany, interest rates can diverge. Isn't it a characteristic of a monetary union that the interest rates are the same everywhere? The answer is that this is the case for the short-term interest rate that is under the control of the common central bank. The long-term interest rates, however, can diverge. These are the interest rates on long-term government bonds. The latter will diverge if the investors attach different risks of holding the different government bonds. Thus, in the example of France and Germany developed here, investors perceive a higher risk of default on French government bonds than on German government bonds. Note also that it is the long-term interest rate that affects aggregate demand.

1.4 Booms and busts in a monetary union

The asymmetric shock discussed in the previous paragraphs is an exogenous event with permanent effects, produced by a change in consumer preferences. Many asymmetric shocks, however, are of a different nature.

Capitalism is a wonderful human invention that manages to steer individual initiative and creativity towards capital accumulation and ever more material progress. It is also inherently unstable, however. Periods of optimism and pessimism alternate, creating booms and busts in economic activity⁶. The booms are wonderful; the busts create great hardship for many people.

Booms and busts are endemic in capitalism because many economic decisions are forward-looking. Investors and consumers look into the future to

⁶ For insightful analyses of this dynamics of booms and busts see Kindleberger (2005) and Minsky (1986).

decide to invest or to consume. But the future is dark. Nobody knows it. As a result, when making forecasts, consumers and investors look at each other. This makes it possible for the optimism of one individual to be transmitted to others, creating a self-fulfilling movement in optimism. Optimism induces consumers to consume more and investors to invest more, thereby validating their optimism. The reverse is also true. When pessimism sets in, the same herding mechanism leads to a self-fulfilling decline in economic activity. Animal spirits prevail (Keynes 1936, Akerlof and Shiller 2009, De Grauwe 2012).

As long as these movements in animal spirits are synchronized between the member states of the monetary union, they pose no additional problem for the union, i.e. the fact that these countries are in a monetary union does not aggravate the booms and busts. Things are different if these movements are not synchronized, i.e. when some countries experience booms and others an economic downturn. Let us analyse the case of desynchronized business cycle movements in a monetary union. We now assume that the asymmetric shock shown in Fig. 1.1 is the result of a recession in France and a boom in Germany.

We distinguish two possible scenarios. The first one is benign; the second one is not. In the benign scenario the union can live with the desynchronized business cycle. Why is this?

First, we note that since this is a business cycle shock, it is temporary, i.e. after some time France will experience a boom and Germany a recession. There is no need for France to try to adjust through wage and price declines, or Germany through wage and price increases, or through emigration of French workers to Germany.

Second, the automatic stabilizers in the budget can be used to do their job of stabilizing the business cycle. In France, the recession leads to a budget deficit; in Germany, the boom leads to a budget surplus. This mechanism will tend to reduce the intensity of the recession in France, because by running a budget deficit the French government injects purchasing power in the economy. It also reduces the intensity of the boom in Germany because the budget surpluses reduce purchasing power in that country.

This scenario, however, can only operate when investors keep their trust in the French government's capacity to service its debt (which in a recession inevitably increases). When investors trust the French government they are willing to buy the extra government bonds without requiring a higher interest rate. In this scenario of trust the French interest rate can indeed be kept unchanged. The reason is that in Germany the government has a budget surplus. When a government has a budget surplus it retires government bonds from the market. Put differently, the supply of German government bonds declines. In France the supply of government bonds increases. If markets trust the French government as much as they do the German government, they will be willing to compensate the reduced holdings of German government bonds in their portfolio by higher holdings of French government bonds. They consider German and French government bonds to be perfect substitutes. It follows that the French government can easily finance its budget deficit because bondholders (mainly German ones in this case) are willing to buy these French bonds.

Thus, in this benign scenario, we observe that capital markets in the monetary union play a stabilizing role: when France is in trouble because of a downturn in economic activity, capital markets will make it possible to transfer revenues from the booming country to the country in recession, thereby alleviating the pain of the recession. <u>One can also interpret this result by referring to insurance. In this benign scenario the capital markets work as an insurance mechanism. France that is hit by a bad shock, a recession, gets some support from the country that experiences good times. All this occur automatically.</u>

The previous scenario was based on the assumption of trust. Let us now introduce the other scenario, in which the increased budget deficit and debt level in France lead investors to lose their trust in the French government. (This was the assumption we made implicitly in section 1.3). This may happen if the recession is particularly deep, and a lot of uncertainty arises about the length of this recession. In this case, investors will start selling French government bonds and buying German government bonds. This leads to a liquidity flow from France to Germany (the opposite of what happened in the previous scenario) and an increase in the long-term interest rate in France coupled with a decline in Germany. The aggregate demand curve in France is pushed further down, thereby making the recession more intense and prolonging it. In Germany the opposite occurs. Note again the self-fulfilling nature of expectations. If the investors expect trouble with the French government deficits and debt because they fear a prolonged recession, their actions prolong the recession. Fear of problems makes these problems more likely to occur.

Thus, in this scenario of distrust the business cycle movements are amplified: the recession is deeper in France and the boom is more intense in Germany. Being in a monetary union then leads to more volatility of output and employment; not a very attractive feature.

Note also that in this scenario, the capital markets of the monetary union cease to be a stabilizing force. On the contrary, countries in a recession experience an outflow of capital, making the recession deeper, while countries experiencing a boom attract capital, making the boom more intense. Desynchronized business cycles in a monetary union make these business cycles more intense. <u>Another way to put this is that in this scenario</u> <u>characterized by distrust, capital markets cease to provide an insurance</u> <u>mechanism. On the contrary, countries experiencing bad times get punished by</u> capital markets and those experiencing good times are rewarded. Exactly the opposite of what insurance mechanisms do.

If France and Germany had chosen not to be in a monetary union, they could have mitigated these destabilizing dynamics. Take the case of France, and assume now that France has kept its monetary independence, issuing its own currency. When, during a recession, investors start selling French government bonds and switch to German bonds, they necessarily have to go through the foreign exchange market. Thus, they will sell French francs and buy German marks. The effect of this is that the French franc depreciates and the German mark appreciates. The French franc depreciation in turn tends to boost aggregate demand in France, while the appreciation of the German mark tends to reduce aggregate demand in Germany. There is a stabilizing effect from exchange rate changes, which is absent when France and Germany belong to a monetary union. Thus, in a monetary union, business cycle movements will be amplified if the financial markets are not fully confident in the solvency of one or more of the member governments. In Box 1.2 we present a case study of the Eurozone during the recent 'Great Recession' and illustrate how asymmetric shocks were amplified by large divergent movements in the long-term interest rates.

Such a scenario occurred after the financial crisis of 2007-08. This crisis hit the members of the Eurozone in very different ways. Some member-countries, mostly Southern countries, were hit very hard and experienced large declines in their GDPs; others, mostly Northern Eurozone countries, experienced a milder recession. As a result, the budgetary situation of the southern Eurozone countries deteriorated more sharply than the one of the northern Eurozone countries. This set in motion a movement of distrust in government bond markets of the Southern countries. We show this in Figure 1.6. This presents the ten-year government bond rates in the Eurozone. While at the start of 2008 these bond rates were practically the same in all the Eurozone countries, by the

end of 2008 large divergences had occurred. Financial markets lost confidence in the capacity of southern Eurozone countries and Ireland to continue to service an exploding government debt. As a result, they sold the government bonds of these countries, thereby raising the interest rates. The mirror images of these selling activities were the purchases of the government bonds of northern Eurozone countries. As a result, the long-term interest rates in these countries declined significantly. In chapter 5 we analyse the mechanism that underlies these destabilizing buying and selling activities in government bond markets in great detail. Note how in 2012 the bond rates of Southern Eurozone countries declined sharply. We will analyse this phenomenon when we discuss the role of the ECB as a lender of last resort in Chapter 7.



Source: Eurostat.

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Box 1.2 Asymmetric shocks and debt accumulation in the Eurozone (2008–18) The industrialized world was hit by a major financial crisis in 2007–08. This led to what has been called the 'Great Recession' of 2008–09, during which GDP declined significantly. From 2010, GDP growth resumed in most countries, but at a very unequal pace. The divergence in the movements of GDP is particularly strong in the Eurozone. We show this in Fig. 1.6. This presents the cumulative growth of GDP from 2008 to 2016 in the Eurozone. We observe very large differences. Six northern Eurozone countries and Spain succeeded in overcoming the recession of 2008–09 and lifting their GDP above the level of 2008. Finland and Portugal reached the 2008 level in 2018 while Italy and Greece still remained below that level (as of 2018).

<<u>COMP: INSERT FIGURE 1.6 NEAR HERE></u>

Figure 1.6 Cumulative growth of GDP (2008-2018).

Source: European Commission, AMECO databank.

These asymmetric shocks had important implications for government finances within the Eurozone. We show this in Fig. 1.7, which presents the government debt ratios (the ratios of government debt to GDP) in the Eurozone in 2008 and 2018. With the exception of Germany and the Netherlands, all countries experienced significant increases in their government debt ratios. These were particularly large in the Southern countries, Spain, Portugal, Italy and Greece. This suggests that there is a correlation between the cumulative growth experiences of the Eurozone countries and the increase in their government debt ratios. We show this in Fig. 1.8. There is indeed a negative correlation. Countries that managed to grow during the period 2008–16 experienced weak increases in their government debt ratios. Countries that experienced sharp

declines in GDP also saw their government debt ratios surge. (Note that the low value of the R²-suggests that there are other factors influencing this relationship.)

< COMP: INSERT FIGURE 1.7 NEAR HERE>

Figure 1.7 Government debt as a percentage of GDP.

Source: European Commission, AMECO databank.

<COMP: INSERT FIGURE 1.8 NEAR HERE>

Figure 1.8 Cumulative growth and increase in debt ratios (2008-18).

Source: European Commission, AMECO databank.

How did financial markets respond to these widely divergent movements in growth and budgetary performance within the Eurozone? We show the answer in Fig. 1.9. This presents the ten-year government bond rates in the Eurozone. While at the start of 2008 these bond rates were practically the same in all the Eurozone countries, by the end of 2008 large divergences had occurred. Financial markets lost confidence in the capacity of southern Eurozone countries and Ireland to continue to service an exploding government debt. As a result, they sold the government bonds of these countries, thereby raising the interest rates. The mirror images of these selling activities were the purchases of the government bonds of northern Eurozone countries. As a result, the long-term interest rates in these countries declined significantly. Note how in 2012 the bond rates of Southern Eurozone countries declined sharply. We will analyse this phenomenon when we discuss the role of the ECB as a lender of last resort in Chapter 7.

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Figure 1.9 Ten-year government bond yields, 2008 19 (monthly data).

Source: Eurostat.

Thus, the different business cycle developments that occurred in the Eurozone led to divergences in the long-term bond rates. These had the effect of making the adjustment problems of the countries hit by negative shocks more severe. These countries faced very high interest rates that further reduced economic activity. The opposite occurred in the countries experiencing positive shocks.

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<u>1.5 The Covid-19 shock of 2020: asymmetric effects of symmetric shock</u>

In 2020 the world was hit by the Covid-19 shock. This was a shock of historic magnitude. As• a result of the sudden surge in the pandemic, supply chains in many countries came to a standstill. As a result, many firms were unable to produce. This in turn led to a loss of income of millions of people, reducing their capacity to spend. A deflationary spiral was set in motion whereby the loss of output led to less demand which in turn reduced output leading to less income and less demand. A deflationary spiral that emerged from a negative supply shock which in turn led to a negative demand shocks.

Most countries were hit by this shock. Thus in a sense it be called a symmetric shock. One might conclude that since the shock was symmetric, it would not pose special problems for a monetary union like the Eurozone, apart from being a terrible blow for many people. But the blow was not made more serious because countries were members of a monetary union. This, however, would not be the right conclusion. The Covid-19 shock was indeed symmetric but had very asymmetric consequences. This is shown in Figure 1.7. We show the GDP-growth during 2020 in the Eurozone countries. Two features stand out. First, the size of the decline in the Eurozone countries: The decline of GDP in the Eurozone as a whole amounted to 6.6%. This was the largest decline in GDP since the Great Depression of the 1930s. Note that other industrialized countries experienced similar declines. Second, the variation within the Eurozone is equally big. Some countries experienced drops in their GDP of 8% to 10% (Spain, Italy, Greece, France), while others saw limited declines of 3% or less (Estonia, Finland, Luxembourg and Lithuania).

These large but very different negative effects of the Covid-19 shock also had major implications for the government finances. All were forced to allow the government budget to go in the red. This mechanism was to a large extend the result of automatic stabilizers in the budget. The large decline in output and income led to large reductions in government revenues. Formatted: Font: Bold
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Formatted: Font: (Default) Times New Roman, 12 pt Formatted: Justified, Line spacing: 1.5 lines In addition, on the spending side, payments of unemployment benefits increased automatically. All this led to automatic increases in the budget deficits. Clearly, these were most pronounced in the countries experiencing the deepest declines in GDP. In addition, in order to stop the deflationary spiral described earlier, governments gave subsidies to firms and instituted temporary unemployment schemes whereby the government paid most of the wage bills to firms so as to prevent them from firing their workers. All this led to massive increases in budget deficits. We show these in Figure 1.8. We observe indeed large but very different increases in budget deficits within the Eurozone. In addition, these increases in budget deficits were very much correlated with the declines in GDP. This feature is shown in Figure 1.9, which presents the GDP growth rates (horizontal axis) and the budget balances (percent GDP) on the vertical axis. We find that these two variables were highly correlated. The stronger the drop in GDP the higher the increase in budget deficits. As a result, countries that were hit most by the Covid-19 shock ended up adding the most to their government debt levels, creating a risk of future self-fulfilling liquidity crises that we described earlier.

We will come back to this issue in chapters 5 and 6 when we discuss the fragility of the Eurozone and how one can deal with this.



Note: The Irish data are unreliable as the GDP numbers of that country are much influenced by the decisions of a few multinational corporations to transfer profits to Ireland. These transfers are pure accounting procedures aimed at profiting from Ireland's low taxation of corporate profits.

Figure 1.8







We can summarize the preceding discussion as follows. Countries in a monetary union that are hit by permanent asymmetric demand shocks need wage flexibility and labour mobility to correct for these shocks. If these asymmetric shocks lead to large budget deficits, financial markets are likely to amplify the effects of these asymmetric shocks, increasing the need for (painful) adjustment in wages and labour mobility. It helps to have an insurance mechanism that allows for income transfers to the country experiencing a negative demand shock. This insurance mechanism, however, does not substitute for adjustment when the demand shock is permanent. What it does is to give countries more time to effect the needed adjustment. To the extent that countries face rigidities and have poorly organized insurance systems, the costs of the monetary union may be substantial.

When asymmetric shocks are temporary, i.e. the results of unsynchronized booms and busts or as a result of a large common shock like Covid-19 with strong asymmetric consequences, the issue is not so much flexibility but stability. The fact that member countries of a monetary union are vulnerable to changing market sentiments can lead to more volatility in the business cycle.

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Thus, a country experiencing a recession and an increase in the budget deficit may be hit by large-scale sales of its government bonds, leading to a liquidity crisis and higher interest rates. This is likely to force the government of that country to introduce budgetary austerity, i.e. to increase taxes and reduce spending, thereby exacerbating the recession. Governments then find out that their capacity to stabilize their economies is severely curtailed, worse that they are forced to implement fiscal policies that destabilize the economy. We analyse some further impilcationsimplications in Chapter 5.

1.65 Monetary union and budgetary union

In section 1.4 we saw that a monetary union can be very fragile. When it is hit by large asymmetric shocks, the member states of the union face difficult adjustment problems. Since asymmetric demand shocks will typically lead to increasing budget deficits in some countries, financial markets may force a liquidity crisis on these countries, thereby amplifying the asymmetric shocks. Can one design a mechanism that will alleviate these problems and thereby reduce the costs of a monetary union?

In principle, it is possible to design such a mechanism in two parts. The first one concerns the role of the common central bank in making it possible to avoid liquidity crises. The second one consists of centralizing a significant part of the national budgets into a common union budget. Here we concentrate on the second part. We will come back to the role of the common central bank in Chapter 7.

The centralization of national budgets amounts to having a monetary union together with a budgetary union. Such a budgetary union achieves two things. First, it creates an insurance mechanism triggering income transfers from the country experiencing good times to the countries hit by bad luck. In doing so, it reduces the pain in the countries hit by a negative shock. Second, a budgetary union allows consolidation of a significant part of national government debts into a common debt, thereby protecting its members from liquidity crises and forced defaults. Let us analyse these two mechanisms.

A budgetary union as an insurance mechanism

Let us return to the two-country model of France and Germany and let us assume that a large part of the government budgets of France and Germany is centralized at the European level. Thus, let us suppose that a European government exists that directly levies taxes (including social security taxes) and directly transfers revenues (e.g. pensions, unemployment benefits) to residents in France and Germany. As a result of such budgetary centralization, a decline in output in France leads to a reduction in the tax revenues of the European government from France, while the tax revenues from Germany increase because German output has increased. At the same time, however, the European government increases its spending (unemployment benefits) in France and reduces these in Germany. The net result of all this is that the central budget automatically redistributes income from Germany, where output has increased, to France, where output has declined.⁷ Put differently, this budgetary centralization allows French citizens to smooth consumption following a negative output shock. Note that there is also consumption smoothing in Germany, but in the other direction. As a result, the cost of the monetary union is reduced, i.e. French and German citizens can stabilize their consumption over time despite asymmetric shocks in output. The reason for Germany's interest in such a scheme is that it can profit from it when it suffers a negative shock.

As in many insurance systems, the main problem of this insurance scheme is that it often leads to moral hazard. This is made clear by its operation within

⁷ In some federal states there also exist explicit regional redistribution schemes. The most well known of these is the German system of *Finanzausgleich*, in which *Länder* (states) whose tax revenues fall below some predetermined range receive compensation from *Länder* whose tax revenues exceed that range.

countries. In many countries (e.g. Belgium, Germany, and Italy) the national budget automatically transfers income from regions with high output growth to regions with low growth. These transfers tend to reduce the pressure on regions to adjust. As a result they become permanent. The use of such schemes at the European level would certainly be problematic. It could lead to a situation in which the centralized budget induces large and permanent transfers from some countries to others. This would certainly create a lot of resistance in countries whose incomes are transferred to other countries (see Schelkle (2017) for an indepth discussion of these issues).

A budgetary union as a protection mechanism

We have seen that a monetary union in which each country keeps its own budgetary independence is very fragile. In such a union, national governments issue debt in a currency they have no control over. This makes these governments vulnerable to movements of distrust that can lead to liquidity crises and forced defaults. It is now immediately evident that, in principle, a budgetary union can solve this problem. The reason is that in a budgetary union, national government debts (or at least a significant part of them) are also centralized into a union government debt. This has two effects. First, the centralization of the national government bond markets into a common government bond market eliminates the destabilizing capital movements from one bond market into the other. Second, the union government acquires the characteristics of a 'stand-alone' government, i.e. it issues debt in a currency over which it has full control. Thus, the union government cannot be confronted with a liquidity crisis (at least if the union maintains a flexible exchange rate with the rest of the world, as in our example of the UK). This budgetary union also implies that there is a strong union government capable of forcing the common central bank into providing for liquidity in moments of crisis.⁸

Is there any prospect that Europe could move into such a budgetary union? The European Union's budget amounts to only 1 per cent of EU GDP, while national budgets typically absorb 40–50 per cent of GDP. There is very little prospect for the centralization of national budgets and national debts at the European level in the foreseeable future. Such centralization would require a far-reaching degree of political unification. It would require a large transfer of national sovereignty in the field of taxation and spending to a European government and parliament. <u>One can doubt whether Tthere is a simply no willingness in Europe to go in this direction. As a result the insurance mechanism and the protection mechanism through budgetary centralization are simply not available in the European monetary union today.</u>

From the previous discussion, it follows that a monetary union without a budgetary union is likely to function in a very different way from a monetary union that is coupled with a budgetary union. The former can be labelled an 'incomplete monetary union', and the latter a 'full monetary union'. We will come back to this distinction in Chapter 5, where we analyse different types of incomplete monetary union. We analyse the fragility of incomplete monetary unions, and in particular of the Eurozone, which is an incomplete monetary union. In Chapter 7, we analyse whether institutions can be created that, although they fall short of full budgetary and political union, may nevertheless provide some insurance and protection for the member states of an incomplete monetary union, such as the Eurozone. We discuss how these institutions can be designed in such a way as to avoid the moral hazard problem. In particular, we

⁸ In Chapter 7 we analyse the role of the common central bank in a monetary union, to avoid the moral hazard problem.

will discuss NextGeneration-EU fund, that was set up during the Covid-19 crisis of 2020 and that gives the power to the European Commission to issue common bonds and to use the proceeds of this bond issue to make transfers to countries most hit by the Covid-19 shock. We will discuss the importance of the common fund in chapter 7 and argue that although it remains relatively small, it is a step in the right direction.

1.6 Private insurance schemes

A budgetary union provides for an insurance mechanism in a monetary union. There is another way to organize an insurance scheme in a monetary union.⁹ This scheme operates through the financial markets. We assume, as before, an asymmetric shock hitting France negatively and Germany positively. Suppose (and this is a crucial assumption) that the financial markets of France and Germany are completely integrated.

Let us concentrate here on how integrated bond and equity markets facilitate the adjustment.¹⁰ As a result of the negative shock, French firms make losses, pushing down French stock prices. Since the equity market is fully integrated, French stocks are also held by German residents. Thus, the latter pay part of the price of the drop in economic activity in France. Conversely, the boom in Germany raises the stock prices of German firms. Since these are also held by French residents, the latter find some compensation for the hard economic times in France. Put differently, an integrated stock market works as an insurance

⁹ The importance of financial market integration in order for a monetary union to function well was first stressed by Ingram (1959).

¹⁰ In Chapter 12, we go into more detail and also analyse the banking sector. Thus, we will assume there is one bond market and one equity market, and that the banking sector is also completely integrated.

system. The risk of a negative shock in one country is shared by all countries. As a result, the impact of the negative output shock in one country on the income of the residents of that country is mitigated.

A similar mechanism works through the integrated bond market. As a result of the negative shock, firms in France make losses, and some also go bankrupt. This lowers the value of the outstanding French bonds. Some of these French bonds are held by German residents, so that they also pay the price of the economic recession in France.

The advantage of this insurance scheme based on private financial markets is that it reduces the danger of moral hazard. However, there is also a large drawback. The poor unemployed in France who do not hold financial assets issued in Germany will obtain little compensation from this private insurance scheme. Instead the well-to-do French citizens with large portfolios of assets are more likely to obtain most of the transfers. As a result, such a private insurance scheme without a public one is certainly going to provide insufficient coverage for a large majority of French citizens.

1.7 Differences in labour market institutions

Up to now, when discussing asymmetric shocks, we have concentrated on demand shocks. There are, however, other asymmetries that may force member countries of a monetary union to institute difficult adjustment processes. We discuss some of these asymmetries in this and in section 1.8.

There is no doubt that there are important institutional differences in the labour markets of European countries. Some labour markets are dominated by highly centralized labour unions (e.g. Germany). In other countries, labour unions are decentralized (e.g. the UK). These differences may introduce significant costs for a monetary union. The main reason is that these institutional differences can lead to divergent wage and price developments, even if countries face the same disturbances. For example, when two countries are subjected to the same oil price increase, the effect this has on domestic wages and prices very much depends on how labour unions react to these shocks.

Macroeconomic theories have been developed that shed some light on the importance of labour market institutions. The most popular one was developed by Bruno and Sachs (1985). The idea can be formulated as follows. Supply shocks, such as an oil price increase, have very different macroeconomic effects depending upon the degree of centralization of wage bargaining. When wage bargaining is centralized (Bruno and Sachs call countries with centralized wage bargaining 'corporatist'), labour unions take into account the inflationary effect of wage increases. In other words, they know that excessive wage claims will lead to more inflation, so that real wages will not increase. They will have no incentive to make these excessive wage claims. Thus, when a supply shock occurs, they realize that the loss in real wages due to the supply shock cannot be compensated by nominal wage increases.

Things are quite different in countries with less centralized wage bargaining. In these countries, individual unions that bargain for higher nominal wages know that the effect of these nominal wage increases on the aggregate price level is small, because these unions only represent a small fraction of the labour force. There is a free-riding problem. Each union has an interest in increasing the nominal wage of its members. If it does not do so, the real wage of its members would decline, given that all the other unions are likely to increase the nominal wage for their members. In equilibrium this non-cooperative game will produce a higher nominal wage level than the cooperative (centralized) game. In countries with decentralized wage bargaining, therefore, it is structurally more difficult to arrive at wage moderation after a supply shock. In such a noncooperative set-up no individual union has an incentive to take the first step in reducing its nominal wage claim, for it risks having the others not follow, so that the real wage level of its members will decline.

The analogy with the spectators in a football stadium is well known. When they are all seated, the individual spectator has an incentive to stand up so as to have a better view of the game. The dynamics of this game is that they all stand up, see no better, and are more uncomfortable. Once they stand up, it is equally difficult to induce them to sit down. The individual who takes the first step and sits down will see nothing, as long as the others do not follow their example. Since that individual is sitting, most spectators in the stadium will not even notice this good example.

This cooperation story has been extended by Calmfors and Driffill (1988), who noted that the relationship between centralization of wage bargaining and outcomes is not a linear process. In particular, the more we move towards the decentralized spectrum, the more another externality plays a role. For in a very decentralized system (e.g. wage bargaining at the firm level), the wage claims will have a direct effect on the competitiveness of the firm, and therefore on the employment prospects of individual union members. Excessive wage claims by an individual union will lead to a strong reduction in employment. Thus, when faced with a supply shock, unions in such a decentralized system may exhibit a considerable degree of wage restraint.

This insight then leads to the conclusion that countries with either strong centralization or strong decentralization of wage bargaining are better equipped to face supply shocks, such as oil price increases, than countries with an intermediate degree of centralization. In these 'extreme' countries there will be a greater wage moderation than in the intermediate countries. As a result, the countries with extreme centralization or decentralization tend to fare better following supply shocks, in terms of inflation and unemployment, than the others. (For empirical evidence, see Calmfors and Driffill 1988; for an in-depth analysis of the importance of different labour market institutions in a monetary union see Hancke 2014).

It follows that a country might find itself in a situation where wages and prices increase faster than in other countries, even when the shock that triggered it all is the same. In terms of the two-country model that we used in section 1.1, the supply curve shifts upwards more in one country than in the other country. This will lead to macroeconomic adjustment problems of the same nature as the ones we analysed in the previous sections.

We conclude that countries with very different labour market institutions may find it costly to form a monetary union. With each supply shock, wages and prices in these countries may be affected differently, making it difficult to correct for these differences when the exchange rate is irrevocably fixed.

Finally we note that there exists an important literature, the literature on 'varieties of capitalism' that analyses institutional differences in capitalistic countries, going beyond labour market institutions. This literature has also been applied to analyse how different varieties of capitalism within the Eurozone have created adjustment problems within the union (see Hall and Soskice 2001; Hall 2012; and Johnston and Regan 2016).

1.8 Differences in legal systems

Despite decades of integration in the EU, legal systems continue to be very different in the member states. These differences run deep and sometimes have profound effects on the way markets function. We concentrate on just a few examples.

The mortgage markets operate very differently in the EU countries. The main reason is that legal systems differ. The law protects the banks extending mortgage loans better in some countries than in others. As a result, mortgages are very different products, with different degrees of risk, from one country to

another. For example, the value of the loan (the mortgage) is typically below the value of the house (the collateral). Thus, the loan-to-value ratio is generally less than 100 per cent. However, the loan-to-value ratio applied by banks in different countries can vary a great deal. Legal differences also lead to differences in the frequency with which interest rates are adjusted. Thus, there are countries where banks offer mortgage loans with a floating/changing interest, and others where mortgage rates are fixed for the whole maturity of the loan. As a result of these differences, the same shocks (e.g. an increase of the interest rate by the ECB) are transmitted very differently across the member states of the monetary union. Several empirical studies confirm that these differences in the transmission of the same shocks can be substantial (see Dornbusch et al. 1998; Cecchetti 1999; Maclennan et al. 1999; Mojon 2000; Peersman and Smets 2001).

The ways in which companies finance themselves are very different across the EU. In countries with an Anglo-Saxon legal tradition, firms tend to go directly to the capital market (bond and equity markets) to finance investment projects. As a result, these markets are well developed, sophisticated, and very liquid. In countries with a continental legal tradition, firms attract financial resources mainly through the banking system. As a result, capital markets are less developed. Here again, these differences lead to the result that the same interest rate disturbances are transmitted very differently. To give an example, take an increase in the interest rate. In countries with an Anglo-Saxon type of financial system, this is likely to lead to large wealth effects for consumers. The reason is that consumers hold a lot of bonds and stocks. An interest rate increase lowers bond and stock prices, so that the wealth of consumers is likely to decline. Wealth effects will be less pronounced in countries with continentaltype financial markets. In these countries, the interest rate increase will affect consumer spending mainly through the bank-lending channel. A sufficiently high increase in the interest rate will induce banks to start rationing credit.¹¹ We conclude that the way in which the same interest rate increase is transmitted into consumption and investment spending will be very different across EU members.

Conclusion

In this chapter we discussed why countries that join a monetary union face important costs. These costs arise from the fact that countries are different in many ways. We observed that countries are able to use national monetary policies, including exchange rate changes, to correct for these differences. We found that in most cases there is an alternative to using national monetary policy as an instrument. For example, when confronted with a loss of domestic competitiveness, countries can try to regain competitiveness by reducing wages and prices. However, these alternatives are often more painful for a member of a monetary union than for a 'stand-alone' country that has kept its monetary independence (including the capacity to change the exchange rate).

Another source of costs arises from the fact that when entering a monetary union, governments have to issue debt in a 'foreign' currency over which they no longer have control. This makes these governments fragile, i.e. vulnerable to movements of distrust in financial markets. These movements can push governments into default against their will. They also have the effect of amplifying the movements in the business cycles.

We concluded that countries could find it costly to relinquish their national moneys and join a currency union, especially when that union is incomplete, i.e. does not include a bugetary union. (Note, however, that we have still not introduced the benefit side of the analysis. It is still possible that even if there

¹¹ For a classic analysis of credit rationing, see Stiglitz and Weiss (1981). For an analysis of the implications for monetary union, see Cecchetti (1999).

are costs associated with relinquishing one's national money, the benefits outweigh these costs.)

The analysis discussed in this chapter, which is based on the theory of optimum currency areas, has been subjected to much criticism. This has led to new and important insights. In Chapter 2 we turn our attention to this criticism.

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Questions

- 1 Why is wage rigidity bad for the healthy functioning of a monetary union? Does your answer depend on the nature of the assymmetricasymmetric shock?
- 2 Is there any reason to think that price rigidities are bad for a monetary union?
- 3 Explain how distrust about the solvency of a country can amplify the effects of asymmetric demand shocks, and why trust has the opposite effect.
- 4 Why does it make a difference whether asymmetric shocks are exogenous permanent or endogenous temporary?
- 5 Explain why capital markets can be both a source of stability and instability in a monetary union.
- 46 Are private and public schemes for insuring against asymmetric shocks perfect substitutes?

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