Medium-Term Review 2013-2020

July 2013

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Summary

The experience of the last five years has been truly exceptional, involving the worst economic crisis in Ireland since the Second World War. The legacy effects of this crisis include a dramatic increase in the indebtedness of the state as well as an exceptionally high level of unemployment.

The purpose of this *Medium-Term Review* is, first, to explore how the Irish economy works; second, to set out a range of possible future scenarios for the economy and third to use these scenarios to consider how domestic policy might improve the possible outcomes. Because of the uncertainty about the future, we consider three possible scenarios or paths for the economy over the rest of the decade. It will be some time before we know which of these scenarios is most likely to be correct and policy needs to take account of this uncertainty.

SCENARIOS

In the **Recovery** scenario, the EU economy is assumed to return to a reasonable rate of growth over the rest of the decade. It is also assumed that the continuing problems in the Irish financial sector are tackled effectively. Under these circumstances, the export sector of the economy would see its markets grow, resulting in increases in output and employment. In turn, growth in foreign demand would help produce a turnaround in domestic demand. As firms increase their sales and their profitability they would need to invest to continue growing. With rising real personal incomes and growth in employment, consumption would also begin growing again.

Demographic pressures would mean that more dwellings would need to be built later in the decade and a recovery in household circumstances would suggest that this investment could, in theory, be financed. Overall, this scenario would see growth in GNP of around 3.5 per cent a year in the second half of the decade (Table 1). While the economy would not be likely to reach full employment by 2020, the level of unemployment could be more than halved to around 6 per cent.

The recovery itself would play a major role in restoring the public finances to a sustainable path. This would allow a shift to a more neutral fiscal stance from 2015 onwards that would be much more supportive of growth.

The **Delayed Adjustment** scenario considers what would happen if the EU economy recovered but domestic policy failed to resolve the ongoing problems in the Irish financial system, or if some other event or policy failure prevented the domestic economy from benefiting from a wider economic recovery. Such a scenario could see the economy seriously underperform its potential.

In this scenario, we focus on only one of the potential domestic risks – the problems with the financial sector. If these problems are not resolved rapidly, growth in the second half of the decade could be closer to 3 per cent a year. This, in turn, would mean that fiscal policy could not relax its stance until much later in the decade and the 2015 and 2016 Budgets would have to take more money out of the economy. This would contribute to the unemployment rate remaining in double digits for most of the decade.

In the **Stagnation** scenario we consider the circumstances where the EU economy does not return to growth in the near future. The result would be a "zombie" decade for the EU and this would have serious consequences for Ireland. With no growth in the EU, the Irish economy, even if managed effectively, would do well to grow at 1 per cent a year over the second half of the decade. The unemployment rate in 2020 would remain where it is today.

The failure of growth would have serious implications for the public finances. In order to keep borrowing under control, continuing tough Budgets would be needed until the end of the decade. In spite of this very tough fiscal stance, the burden of debt would remain very high, leaving the economy very vulnerable to new shocks. Any attempt to use fiscal policy to stimulate domestic demand would rapidly run into twin constraints: the need to keep the government debt sustainable and the need to maintain broad balance on the current account of the balance of payments.

IMPLICATIONS

Because of the imperative of ensuring that the public finances are sustainable, the only option for fiscal policy over the last five years has been to adopt a strongly pro-cyclical stance. If the *Recovery* scenario proves to be closest to reality it should be possible to escape this bind fairly soon. However, if the *Stagnation* scenario were to prove most relevant, no such escape would be possible in the near future.

Because of the uncertainty about the future, a "no regrets" approach to fiscal policy would entail implementing the planned €3 billion in cuts in the 2014

Budget. Then, if the *Recovery* scenario proved correct, that adjustment would be the last needed to restore order to the public finances. Growth in the economy would see the government accounts move into surplus by 2018 and the debt /GDP would continue on a downwards trajectory, consistent with fiscal rules. Failure to implement the planned 2014 Budget would still leave a need for some cuts at a later date and the short-term benefit to growth would be fully offset in the medium term. However, if the *Stagnation* scenario proved correct, the failure to make the adjustment in 2014 would leave a very big adjustment to be achieved in 2015 and 2016. Because of the continuing very high debt levels under the *Stagnation* scenario there would be no room for further delay in the fiscal adjustment after 2014.

The *Delayed Adjustment* scenario points to the need to resolve the continuing problems in the financial sector very rapidly. Failure to do so could both prejudice a potential recovery in the economy and it could also result in increasing the debts of the State. By contrast, a rapid resolution could see the State realising some gains on its financial assets by the end of the decade, further reducing sovereign indebtedness.

The contrast between the unemployment rates in the *Recovery* scenario and the *Delayed Adjustment* scenario suggests that there are potential problems in the labour market. There is a danger that the skills and experience of the long-term unemployed could be impaired by their time out of work so that they might not benefit from a return to employment growth. This highlights the need to develop a suite of labour market policies to ensure that, in the event of a recovery, the long-term unemployed find their way back into employment.

If the *Stagnation* scenario proves to be closest to reality, the government's scope for action will be very limited. The failure of growth at an EU level could only be addressed by an EU policy response. The vulnerability of the economy, arising from the continuing high debt level, could only be addressed through a firm agreement that any future capital needs of the financial sector would be met from the EU ESM.

Finally, the Irish growth model remains vulnerable to shocks from outside Ireland. As a result, it will be important that the driving force behind the export sector moves gradually away from businesses that are dependent on the low corporate tax regime to businesses that rely on other aspects of Ireland's competitive advantage.

SUMMARY TABLE[1]

	2013	2014	2015	2016	2017	2018	15-20
Recovery Scenario							
GDP, %	1.7	3.0	4.0	4.1	4.2	3.7	4.0
GNP, %	1.2	0.5	4.3	3.6	4.0	3.4	3.6
General Govt. Deficit, % of GDP	7.3	5.0	3.2	1.2	0.4	-0.3	-1.0
Unemployment Rate, % of Labour Force	14.0	13.4	11.8	10.6	9.5	8.2	5.6
Delayed Adjustment Scenario							
GDP, %	1.8	1.9	2.7	1.9	2.7	3.0	3.3
GNP, %	1.3	-0.9	3.0	1.1	2.8	3.1	3.2
General Govt. Deficit, % of GDP	7.3	9.2	3.2	1.2	0.3	-0.4	-1.0
Unemployment Rate, % of Labour Force	13.9	13.8	12.9	13.5	13.1	11.9	8.4
Stagnation Scenario							
GDP, %	1.7	3.5	1.3	1.1	2.0	0.8	1.4
GNP, %	1.2	0.0	1.9	0.6	2.1	0.4	1.1
General Govt. Deficit, % of GDP	7.3	4.5	2.7	2.5	2.0	0.6	0.7
Unemployment Rate, % of Labour Force	14.1	13.1	12.5	13.4	12.8	12.5	11.8

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[1]   For the General Government Deficit and the Unemployment rate the figures in the final column are for 2020.

Chapter 1

Introduction

This *Medium-Term Review* is the twelfth to be produced by ESRI staff since the publication was first introduced in 1986. Since the last *Medium-Term Review* was published in 2008 two supplementary publications of a similar character were released in 2009 and 2010.[2] Over the last quarter of a century the purpose in undertaking this exercise has been, first, to understand how the Irish economy works; second, to set out a range of possible future scenarios for the Irish economy and third to use these scenarios to explore how domestic policy can improve the possible outcomes. It is this latter purpose, to provide a basis for policy formation over the next few years, that is ultimately the most important reason for undertaking the analysis described here. However, to undertake this latter task of providing a basis for policy formation the first task, of developing a good understanding of how the economy works, is also an essential stepping stone.

The introductions to all previous *Reviews* have stressed the uncertainty that necessarily surrounds the scenarios for the future growth path of the economy contained in the *Reviews*. To reflect this uncertainty, previous *Reviews* have presented a range of different scenarios rather than a single forecast. However, the experience of the last five years has shown that even the diverse scenarios presented in previous *Reviews* did not properly capture the full severity of the recent crisis. This is a salutary lesson. In this *Review* we publish a number of scenarios that involve widely differing outcomes but, as in previous *Reviews*, we also acknowledge that other events, which may today appear very improbable, could produce outcomes well outside the range we consider. While we believe that such extreme possibilities are very unlikely, recent experience shows that such events can occur.

The forecasting record of past *Reviews* is analysed in Appendix 1. However, more important than the forecasts themselves were the implications for policy that the *Reviews* gave rise to. The policy implications drawn from past *Reviews* are reviewed in more detail in FitzGerald (2012a) and FitzGerald (2012b).

The current crisis has proved rather different in nature to the crises of the previous half century. Economists have characterised the possible outturns in the

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[2]   Bergin, *et al.* (2009b) and (2010).

current crisis in terms of "multiple equilibria" – there are widely different possible outcomes and, depending on the trajectory the economy takes in the near term, the final destination of the economy may be very different. Under these circumstances, the likely outturn in a decade's time will not be some middle path.

Random or unexpected events can set the economy on a particular course to one of these "equilibrium" outcomes. Once set on that path it may be very difficult to move the economy onto an alternative path, which might initially have seemed a feasible destination. The task of policymakers is to try to ensure that the economy follows the more favourable of the alternative future trajectories. The intervention by our partners[3] in 2010 in providing affordable funding for Ireland, and also the intervention by the ECB in the summer of 2012 committing to take whatever steps were necessary to maintain EMU, are examples of policy interventions that may have changed the trajectory of the Irish economy (and of other EU economies) towards a sustainable path. By contrast, the exact nature of the guarantees of the banking system given by the government in 2008 potentially moved the Irish economy onto a very unfavourable trajectory.

When developing future policy it is important that the measures implemented are framed on a "no regrets" basis, so that they will be likely to improve outcomes, no matter what the actual outturn. The reason for taking such a risk-averse stance is that, under current circumstances, the costs of underestimating the government deficit is likely to be much greater than the benefits from overestimating the deficit. As new information becomes available, policy can then be adjusted; it is easier to relax fiscal policy if things turn out better than expected rather than to tighten it if things turn out worse. The results of such a cautious analysis will not always produce the "optimal" policy for Ireland for a specific outturn but, rather, it should result in a set of policies that will produce favourable outcomes under a broad range of scenarios. This means that policymakers need to test their plans against a variety of different scenarios to see what the effects might be. One of the tasks of this *Review* is to provide such a test bed for policymaking.

We consider how policy failure at an EU level could result in stagnation in Europe over the rest of the decade, with a consequential very adverse impact on the Irish economy.[4] It is only at an EU level that this policy problem can be addressed. Thus the scope for effective domestic policy action in Ireland is limited in that scenario. However, we also look at two scenarios where the EU economy recovers in the coming years. The difference between these two *EU Recovery*

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[3] The EU, the IMF and the governments of Demark, Sweden and the UK.

[4] For the case of an EU recovery we use a forecast for Europe based on the UK *National Institute Economic Review* of January 2013. We use the NIESR NiGEM model to generate the Stagnation scenario for the EU.

scenarios concerns the stance of domestic policy. In the first case domestic policy supports the recovery while in the second case domestic policy seriously delays domestic recovery. This highlights the importance of focusing domestic policy on the issues within the control of the Irish authorities to ensure that future economic development is maximised, conditional on whatever happens at the European level.

Since the ESRI began publishing *Medium-Term Reviews* an essential tool used in the analysis has been the ESRI's *HERMES* macro-economic model of the Irish economy. The model incorporates the results of a wide range of research about the Irish economy that has been undertaken over the last twenty-five years, in the ESRI and elsewhere. The model itself has evolved in its understanding of how the economy behaves. However, the key insight of the original *HERMES* model remains valid today: the level of activity in the Irish economy is crucially dependent on the share of world output that is attracted to the Irish economy (Bradley and FitzGerald, 1988 and Bradley *et al.*, 1993b). A description of the current version of the model is included in a separate Working Paper, Bergin *et al.* (2013).

Over time, new mechanisms have been added to the model. In the late 1980s, to deal with the last major economic crisis in Ireland, a model of government debt and a detailed model of the public finances was developed (Bradley, *et al.*, 1993b). This particular module has proved very useful in understanding the current situation. In the last decade a model of the housing market was developed (Duffy, FitzGerald and Kearney, 2005). It was used in the 2005 *Review* to consider the implications for the economy of a collapse in housing prices. The version of the model used in the 2008 *Review* incorporated a refined model of labour supply to deal with a situation where there was considerable immigration, as well as emigration (FitzGerald *et al.,* 2008). This 2013 *Review* uses the latest version of the *HERMES* model, which has a number of additional features. The risk premium on government borrowing is now incorporated as a function of indebtedness and borrowing. The saving behaviour of households is modelled in a more sophisticated fashion than in the past; it allows for the effects on consumption of deleveraging by households as a result of a collapse in house prices. This version of the model does not have a fully-fledged financial sector: that is work in progress. However, while not incorporated into the formal model, in Chapter 5 we use the latest available research on the financial sector of the economy to consider how the future course of the economy might be affected by a failure to resolve the current crisis in that sector.

Over the last twenty years each *Medium-Term Review* has referred to some relevant story from classical Greek mythology. In the 2003 *Review* we began with

the story of Icarus. At the time we were concerned that unduly expansionary fiscal policy, specifically the failure to control the housing market, meant that the Irish economy was flying too close to the sun. Like the advice of Daedalus, this warning was subsequently ignored! Reflecting on the growing dangers arising from the property boom the Introduction to the 2005 *Review* reflected on the story of the Lotus-eaters from the Odyssey. The crew of Ulysses' ship were distracted by the Lotus-eaters, nearly derailing their voyage. However, with a huge effort Odysseus got them back to their ships and the painful nature of the effort was reflected in the following passage:

> I forced them back to the ships and made them fast under the benches.
> ….. so they took their places and smote the grey sea with their oars.
> HOMER, *Odyssey*, Book IX, vss. 83-104

Since 2008, like the crew of Ulysses, Ireland has had a very difficult time setting a suitable course for the future.

It is too early to determine whether Ireland is set on a sustainable escape path from the recent economic crisis. As discussed later in this *Review,* there are many things that could still go wrong, or that may take a long time to put right, delaying a full recovery. Economists are notoriously bad at predicting turning points and it will only be after at least two years of sustained recovery that we will be certain that the recovery has really begun.

Chapter 2 of this *Review* briefly revisits the history of the economy over the last five years. Chapter 3 provides an overview of the scenarios described in this *Review*. Chapter 4 sets out the assumptions underlying the scenarios and the three rather different scenarios are described in Chapter 5. As discussed above they represent two possible "equilibrium" outcomes – a relatively benign *Recovery* scenario with a return to growth over the rest of the decade and a much less pleasant "European Stagnation" scenario, where policy failure in Europe sees the Irish economy continuing on an exceptionally vulnerable low-growth path to the end of the decade. A third scenario is also considered where the EU economy recovers but domestic policy failures seriously delay the domestic recovery. Chapter 6 discusses in more detail how the Irish economy is likely to respond to changes in key variables, using the *HERMES* model to throw light on how the economy reacts to different stimuli. Finally, in Chapter 7, some conclusions concerning the policy implications of this analysis are set out. As in previous *Reviews*, we set out in Appendix 1 an analysis of the forecasting record of previous publications. Bergin *et al*. (2013), describe some of the key features of the *HERMES* model used in this *Review*, including the fiscal policy indexation rules*.* More detailed tables are available at http://www.esri.ie/irish_economy/mediumterm_review/

Chapter 2

The Background

2.1   Introduction

Before analysing alternative paths for the economy out of the current crisis, it is useful to review some of the key developments which have shaped the economy over the last decade. Many of the problems that have been faced in attempting to emerge from the current difficulties have their roots in imbalances which grew over the last decade, and these are discussed below. The crisis in the banking system and the related imbalance in the state's finances are linked to problems which have demanded the most urgent and robust response from the authorities so far in the crisis. This section also examines the impact of the fiscal consolidation measures introduced since 2008 and considers how they have impacted on the economy.

2.2   A Housing and Credit Bubble

Over the past 20 years Ireland has experienced a strong economic expansion followed by a sharp economic contraction. The Irish economy enjoyed an exceptional period of growth from 1994 through to the mid-2000s (Figure 2.1). It resulted in the standard of living in Ireland, measured as GDP or GNP per head, rising above the average for the EU-15 in the late 1990s and the early years of the 2000s (Figure 2.2). However, the result of the crisis has been to reduce GNP per head to slightly below the average for the EU-15 (though GDP per head still remains above average).

FIGURE 2.1   Irish Economic Growth, GDP per cent
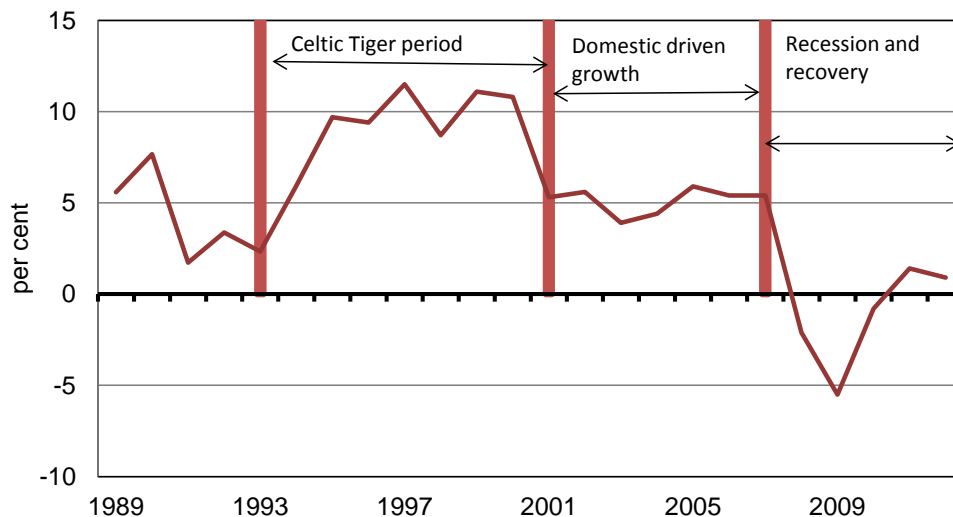
FIGURE 2.2   GDP and GNP Per Head Relative to the EU-15 Average
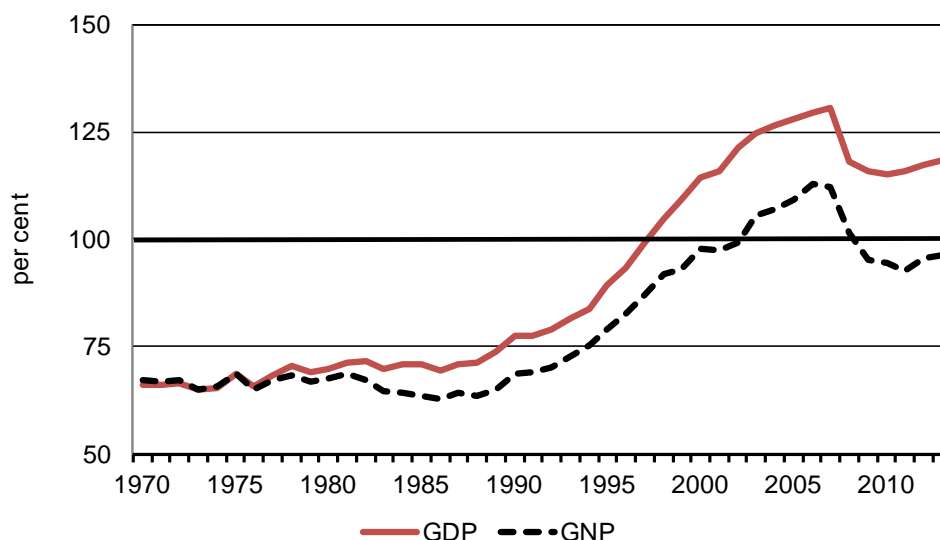
Source: EU AMECO database. The GNP figures are obtained by adjusting the relative GDP figures by the ratio of GNP to GDP for Ireland.

Up to the early years of the last decade growth was largely driven by the expansion in world trade and a rapid increase in world market share for Irish exports. The dramatic rapid rise in employment and incomes, together with the increased availability of low cost finance as a consequence of EMU membership and the globalisation of the financial sector, resulted in a boom in the building and construction sector in the last decade; in particular there was a rapid expansion in house building (Conefrey and FitzGerald, 2010). This housing boom drove economic growth over the "bubble" years from 2003 onwards, so that the level of actual output rose well above the potential output of the economy.

The second strand of the emerging bubble can be seen in the rapid growth of private sector credit, which increased from 100 per cent of GDP in 2002-2003 to well over 230 per cent of GDP by 2009. The majority of this increase in bank lending was financed by a capital inflow from abroad through the banking system. While domestic savings were sufficient to fund the housing boom up to around 2003, thereafter they proved inadequate. Instead, the banking sector financed the boom by borrowing increasing sums abroad and relending these funds domestically to the property sector.

Membership of monetary union resulted in less attention being paid to a "conventional" early warning indicator of domestic imbalances – the current account of the balance of payments. The big increase in investment in housing was reflected in a growing deficit on the current account of the balance of payments, (Figure 2.3), matched by a growing surplus on the financial account, reflecting the foreign borrowing by the banking sector. The deficit on the current

account began to deteriorate from 2003 onwards, a much earlier indicator of looming danger than output, employment or public finance indicators.

FIGURE 2.3   Balance of Payments Current Account Balance, as a % of GNP
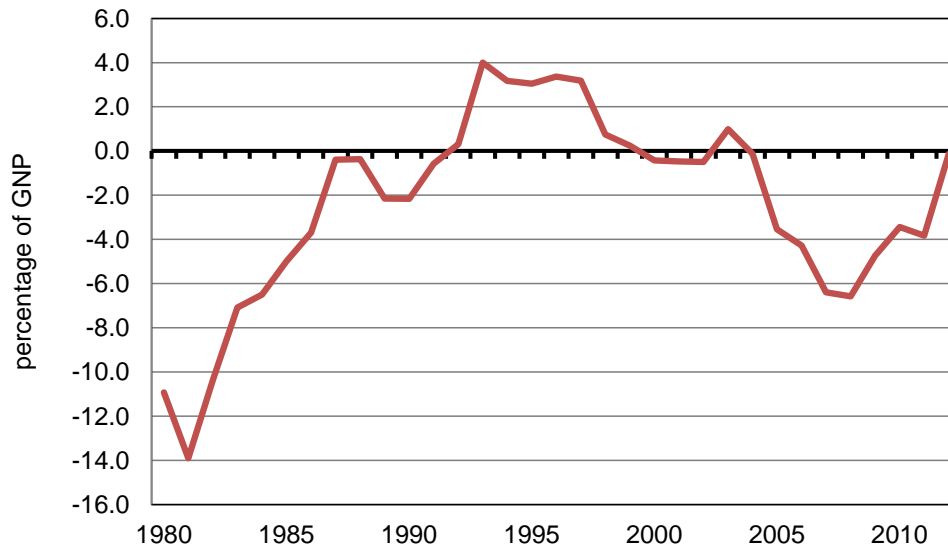
Source: Central Statistics Office Balance of Payments adjusted for Redomiciled PLCs (FitzGerald, 2013).

2.3   The Property and Credit Bubble

The global financial crisis, that started in the US sub-prime mortgage market, triggered an end in the Irish economic boom. Contagion from the US spread to the European financial system through a number of channels. For example, it had a particularly negative impact on institutions that depended on the interbank market for much of their funds. The bursting of the bubble caused significant damage to the economy, both in terms of measured economic activity and in employment. Whether measured by GDP or GNP, the latest data suggest that output per head is at levels last seen in the early years of the last decade, while the unemployment rate has soared from below 5 per cent of the active labour force in 2007 to over 14 per cent by 2012. The housing market shrank dramatically in response to the crisis. House prices have fallen by over 50 per cent from their peak and house completions are less than 10 per cent of peak output levels (Figure 2.4).

FIGURE 2.4   House Completions
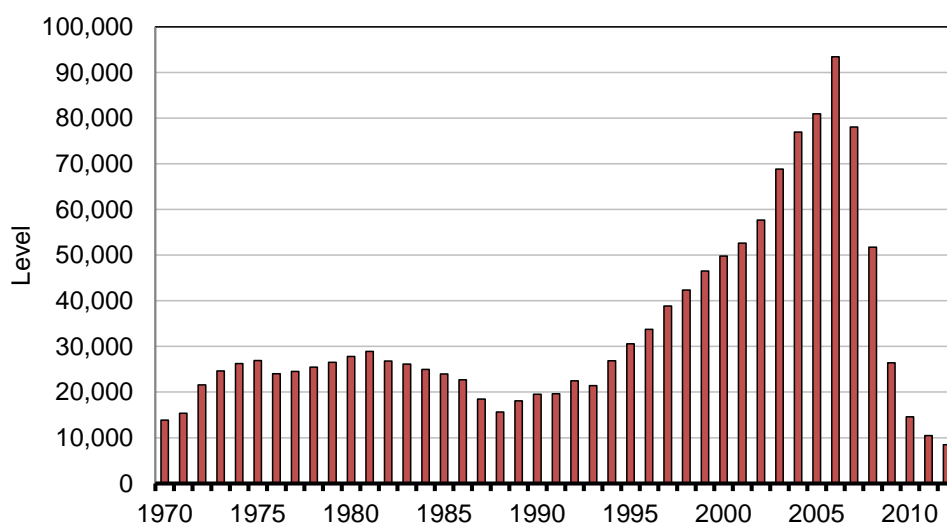
Source: Department of the Environment, Heritage and Local Government.

Private sector credit grew rapidly over the course of the boom. Much of this was borrowing by households to finance house purchases. The increase in borrowing left households vulnerable to the impact of the financial crisis. At its peak household debt was over 220 per cent of disposable income (Figure 2.5). The ratio has now declined to just over 200 per cent, its lowest level since Q4 2006, reflecting deleveraging by households. However, for households on tracker mortgages the fall in interest rates has provided some relief.

FIGURE 2.5   Household Debt Levels, and as a % of Personal Disposable Income
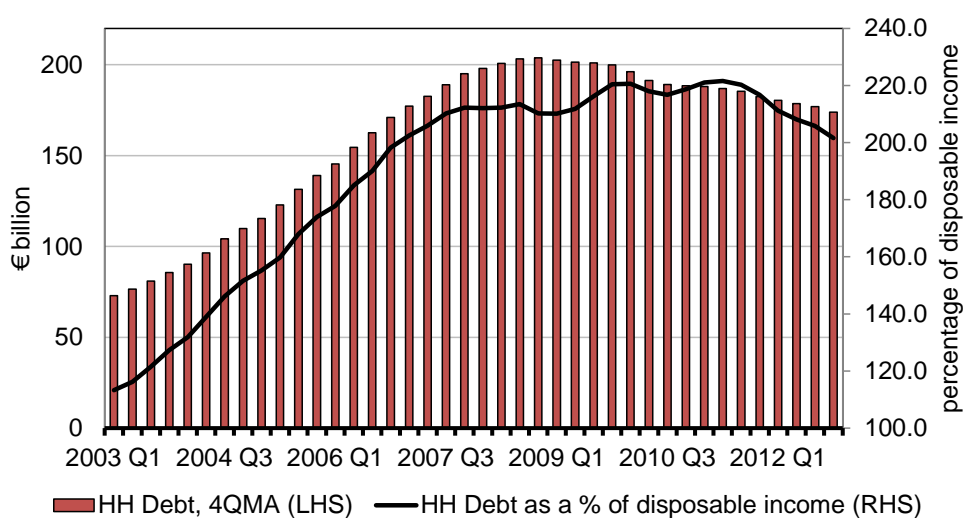
Source: Based on data from the Central Statistics Office and Central Bank of Ireland.

The combination of a high debt burden, a housing market crash and a sharp economic contraction has had serious consequences for the household sector, which undertook high levels of borrowing during the boom years. The sharp

house price decline has meant that negative equity is widespread, particularly amongst younger households (Figure 2.6). Duffy and O'Hanlon (forthcoming) estimate that approximately 214,000 households were in negative equity by the end of 2012 (37 per cent of mortgaged households and around 13 per cent of all households), and that of those who took out a mortgage between 2005 and 2012 and are in negative equity, over 75 per cent are households where the household head was aged 40 years or under in 2012.

FIGURE 2.6   Cumulative Negative Equity
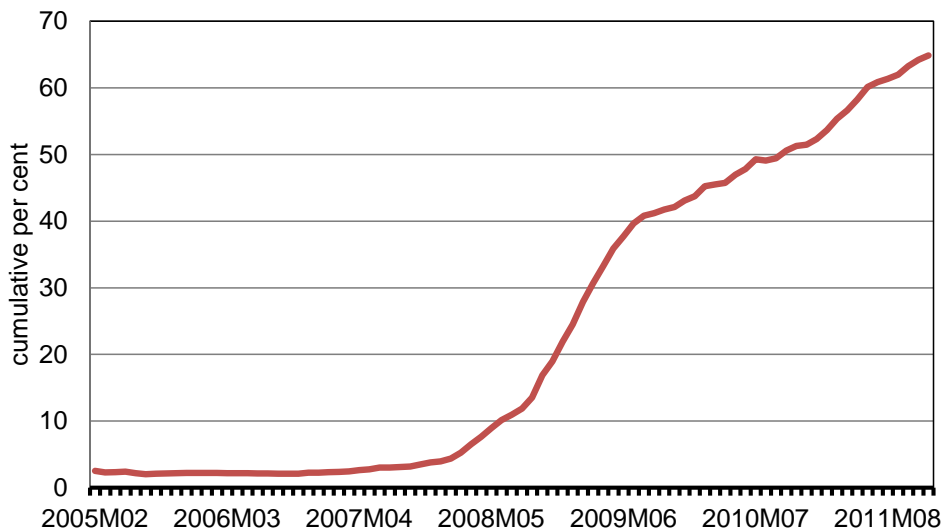
Source: Duffy and O'Hanlon, forthcoming.

Rising unemployment levels and reductions in income are also reflected in statistics on mortgage arrears. These show a steady rise in mortgages in arrears of 90 days and over. By the end of 2012 this had reached 95,000 mortgages or 11.9 per cent of mortgages taken out to purchase a family home, see Figure 2.7. A large number of mortgages have also been restructured, 80,000 at end-December 2012, of which 42,000 were not in arrears.

FIGURE 2.7   Residential Mortgage, Arrears > 90 Days
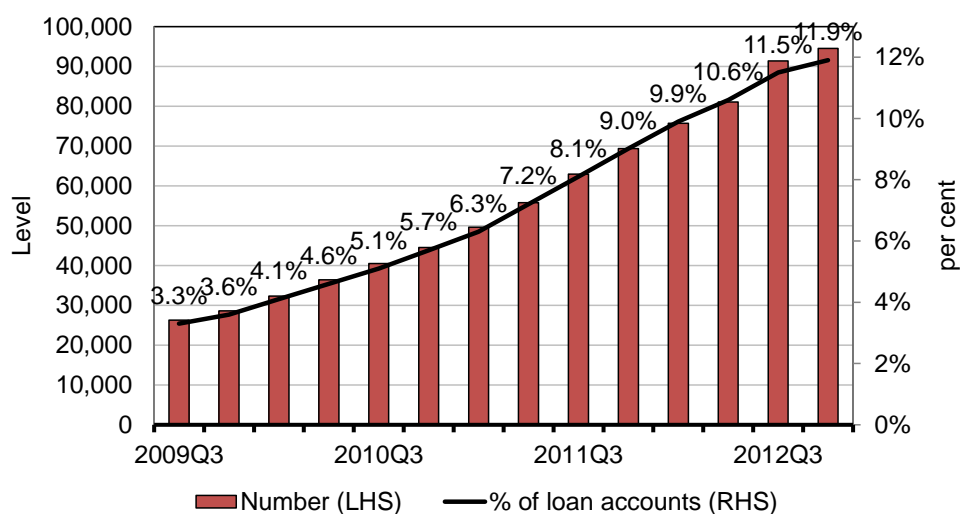
Source: Central Bank, *Residential Mortgage Arrears and Repossessions Statistics.*

2.4   Unemployment Crisis

The unemployment rate grew with alarming speed between 2008 and 2012, peaking at just over 15 per cent of the labour force (Figure 2.8). The labour market, which began to show signs of stabilisation during 2012, has recently made progress in terms of falling unemployment and improving employment levels. According to the Quarterly National Household Survey (QNHS), in the first quarter of 2013, the level of unemployment fell below 300,000 and the unemployment rate was reduced to 13.7 per cent. Although small increases in employment have been recorded over recent quarters, these gains have made only small inroads into the high level of unemployment, which has a worryingly high long-term component. Meanwhile, net outward migration of roughly 30,000 per annum has continued since 2010. The largest group of net migrants are those aged 15-24 (both genders), followed by males aged 25-44.

FIGURE 2.8   Total and Long-Term Unemployment Rate

Source: Central Statistics Office *Quarterly National Household Survey*.

The elevated level of long-term unemployment is particularly worrying as it could lead to the emergence of long-term structural unemployment that would be hard to reduce in a recovery. Figure 2.8 shows that the long-term unemployment rate, those out of work for more than one year, has risen considerably since 2009 and now accounts for roughly 60 per cent of total unemployment. Furthermore, it is much higher among men, particularly young men. The legacy effects of large falls in construction employment are evident in the sector-specific nature of the unemployed. This could also possibly give rise to "hysteresis" effect, making it difficult for the long-term unemployed to return to full employment.

In addition to the fall in employment, there has also been a big reduction in participation in the labour market. The participation rate peaked just above 64 per cent in 2007 and has declined since then, dipping below 60 per cent in 2012 – the lowest participation for nine years. The group most affected by this reduction in participation has been young men aged 15-24, for whom participation dropped from 59.6 per cent in 2007 to 41.3 per cent in 2012. Participation has also fallen considerably for young women, from 52.5 per cent in 2007 to 39.7 per cent in 2012. A very significant factor in this fall in labour force participation among the younger cohort has been an increase in participation in education. This rise in participation in education holds out the prospects of some longer-term benefits as it enhances the future earning power of those involved.

Figure 2.9 shows what the measured unemployment rate would be using wider definitions of labour force participation, to include those who are "discouraged workers", underemployed part-time workers and those who are not in education but who want work. Using the widest definition, the measured unemployment

rate in the first quarter of 2013 was 25 per cent. Figure 2.10 helps to clarify this issue. It shows total employment and the total labour force from peak to today. At its peak, in 2008 quarter 1 the total labour force included 2.277 million people. By the third quarter of 2012 this had fallen by 128,000 to a recent trough of 2.149 million. This very sharp fall in labour force participation means that headline unemployment numbers are lower. However, it is likely that these figures mask potential pent-up labour supply, which could well be expected to rise were labour market conditions to improve.

FIGURE 2.9   The Unemployment Rate
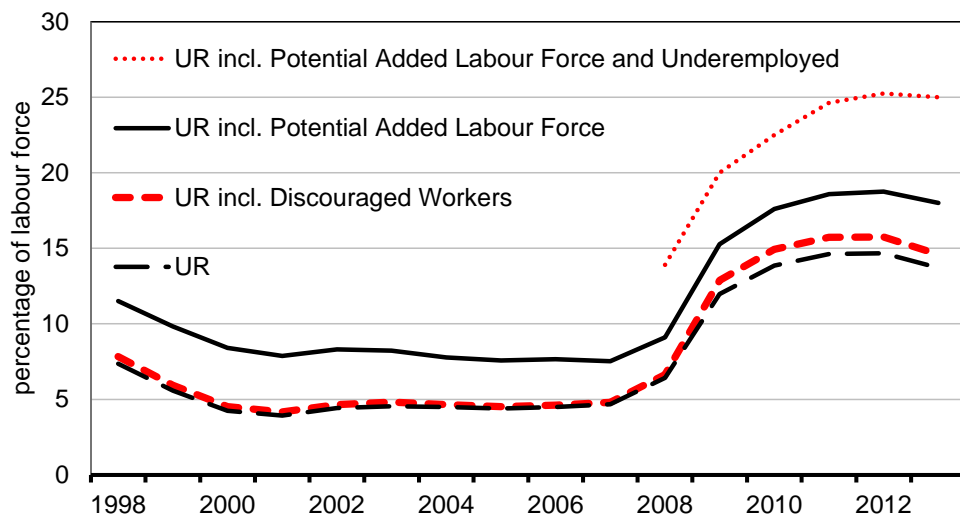
Source: Central Statistics Office *Quarterly National Household Survey*.

FIGURE 2.10   Loss of Jobs During Recession
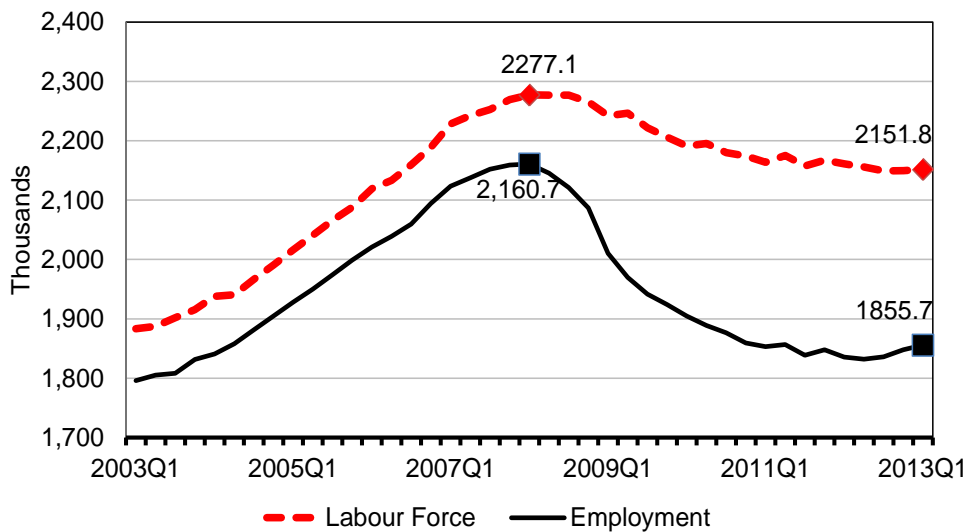
Source: Central Statistics Office *Quarterly National Household Survey.*

The rise in unemployment has had significant implications for financial stability and the public finances. In addition, the problems in the labour market have combined to have a serious negative impact on the standard of living of the population as a whole. Box A discusses the distributional impact of what has happened in Ireland over the last five years.

Box A: Inequality During Ireland's Great Recession

Tim Callan

Recessions affect the distribution of income through many different channels. The direct effect which first springs to mind is the loss of income for those who become unemployed – and with unemployment rising from 4 to over 14 per cent, this is clearly of major importance in the Irish case. Differences in the risk of unemployment across occupations and levels of education also affect how the income losses are distributed. The collapse of the housing bubble led to major job losses in the building industry and in related trades and professions. But there also tend to be broader changes in income patterns over the business cycle: self-employed incomes tend to rise faster than average during an upswing, and fall more than average in a recession. During the current recession, the austerity package has also included very substantial changes in taxes and in many welfare payments (notably Child Benefit and payment rates on working-age schemes).

The best way to take account of these multiple and complex influences on incomes is to use micro-level data on household incomes, such as that gathered by Central Statistics Office (CSO) in its *Survey on Income and Living Conditions* (*SILC*). The latest release by CSO incorporates new data for 2011 and revised data for 2010. The most commonly used summary measure of inequality is the Gini coefficient, which takes a value of zero for perfect equality, and 1 for complete inequality. The value for Ireland has been very stable: Nolan *et al.* (2012) show that it remains in the range 0.31 to 0.32 for most years. During the recession, the Gini coefficient has also remained within this range, with the exception of 2009, when it fell to just over 0.29 (indicating lower inequality in that year). Callan *et al.* (2013) suggest that increases in welfare payment rates in the October 2008 Budget were a potential explanatory factor.

Callan *et al.* (2013) undertake a more detailed analysis of income distribution over the years 2008 to 2011, based on analysis of *SILC* microdata.[5] They find that, while the Gini coefficient is stable, there have been falls in the income share going to the bottom and top deciles. Real incomes fell across the income distribution, but the sharpest losses have been in the income positions at the bottom of the income scale (bottom decile) with above average losses also for income positions at the top of the income scale (top decile). As individual people move into and out of income deciles – and indeed some will have left the country

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[5]   They examine shares of total income going to each "decile" of the population. People are ranked from poorest to richest based on their household's disposable income (i.e., after taxes and benefits) adjusted for family size and composition, and then divided into 10 equal-sized groups.

– these are not comparisons of the same group of people. Changes in the composition of the income deciles have to be further analysed to understand the full picture.

One thing which is clear from analysis using *SWITCH*, the ESRI tax-benefit model, is that the net effect of changes in direct taxes, welfare and public service pay policies has been to reduce incomes by a greater percentage at the top of the income distribution, and by less towards the bottom. This being so, the sharp reductions in the income of the bottom decile are not policy-induced, but reflect the direct impact of the recession.

Figure 2.11 shows that the educational profile of the unemployed has changed radically from the 2000s. In 2000, 41 per cent of those unemployed had a Leaving Certificate or higher level of educational attainment, whereas now this is 70 per cent. This changes the sort of interventions and training programmes required to enhance the prospects of those who are unemployed today obtaining jobs in any recovery. It also paints a slightly more optimistic picture of what the future might hold if the economy recovers. Experience has shown that the higher the education level, the better the employment prospects are for the unemployed in a growing economy.

FIGURE 2.11   Educational Profile of Unemployed
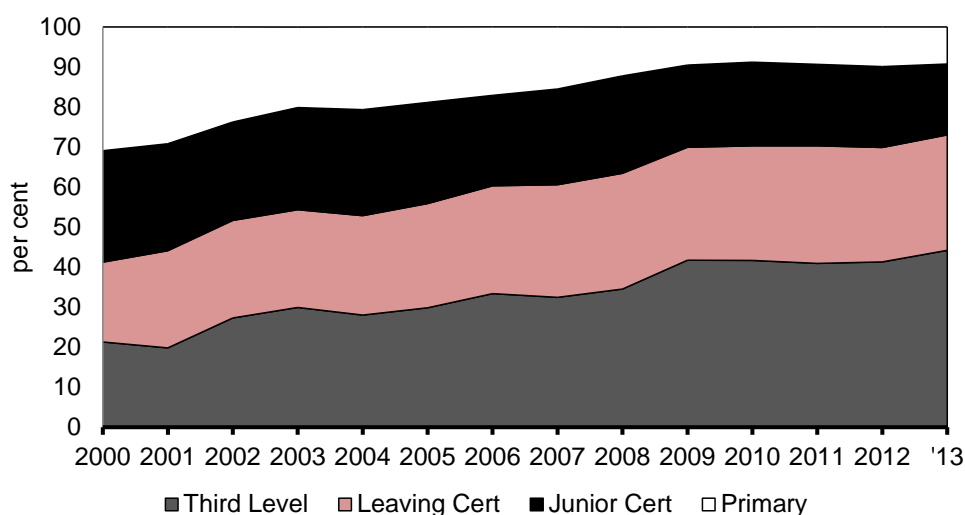
Source: Central Statistics Office *Quarterly National Household Survey*.

2.5   An Explosive Debt Crisis, the Banking Crisis and Fiscal Adjustment

The collapse in the housing market, the resulting implosion of the domestic banking system and the related rise in unemployment, led to a dramatic deterioration in the public finances. Over the period 2000 to 2007 Irish government debt was low and falling. Having been one of the EU economies with

the lowest government debt burden in 2007, Ireland has moved to being one of the more heavily indebted economies. The very rapid deterioration in the fiscal position from 2007 onwards, greatly aggravated by the large transfers of funds to the banking system and direct injections of capital into the banks, meant that gross government debt was estimated to be 118 per cent of GDP by the end of 2012 (Figure 2.12).

Figure 2.12 shows the dramatic impact that direct government intervention in the banking system has had on the government debt figures since the beginning of 2009. Just under 40 percentage points of GDP of the increase in the debt was directly attributable to the money transferred to the banking system under a number of mechanisms. However, over 50 percentage points (of GDP) of the debt at the end of 2012 was attributable to the borrowing undertaken since 2008 to finance the "fiscal debt", that is the effect of the cumulative fiscal deficits on the original total stock of debt. Closing the huge gap in government funding has been the key target of fiscal policy over the last five years.

The fall-out from the crisis in the banking system has had even wider effects than the huge addition to the government debt. The banks themselves have major continuing problems and there are real concerns as to how ready the financial system will be to fund any recovery in the economy.

FIGURE 2.12   General Government Gross Debt, per cent of GDP
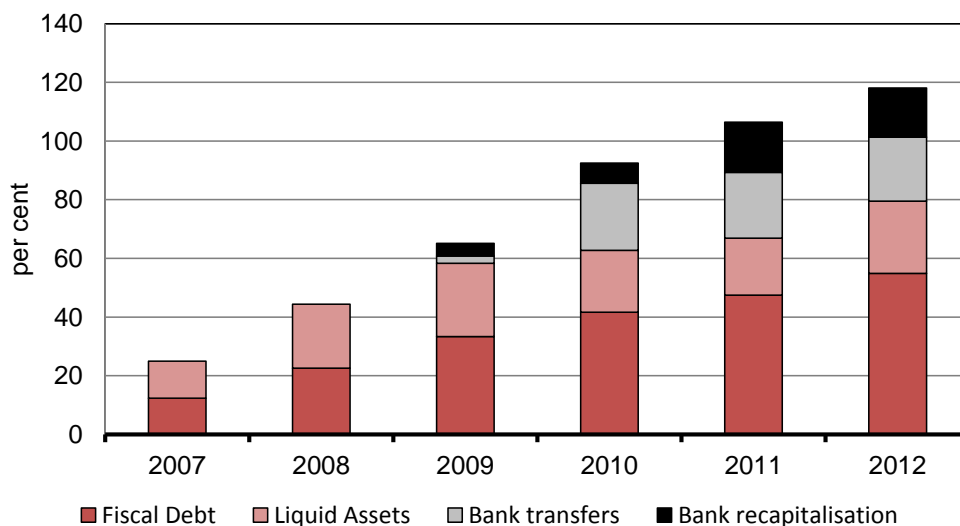
Source: Central Statistics Office, *Government Financial Statistics*, ESRI estimates.

In late summer 2010 the government still expected to be able to fund itself on financial markets. However, as the full magnitude of the potential losses in the banking system began to be apparent in the autumn of 2010, the government

had to seek aid from the IMF/EU towards the end of that year. One of the key factors driving nervousness in the markets at that time was the scale of the contingent liabilities related to the banking system that were not included in the official debt figures.

Figure 2.13 shows the General Government Deficit as a per cent of GDP. The deficit figures in 2009-2011 include the money needed to pay the losses of the banking system and to recapitalise the surviving banks. While it is necessary to exclude the effects of banking interventions to arrive at the "underlying" deficit, these banking interventions have had a significant effect on the measured deficit, particularly in 2010. As discussed later, they have also contributed to the very high risk premium on Irish government bonds.

FIGURE 2.13   General Government Deficit, per cent of GDP
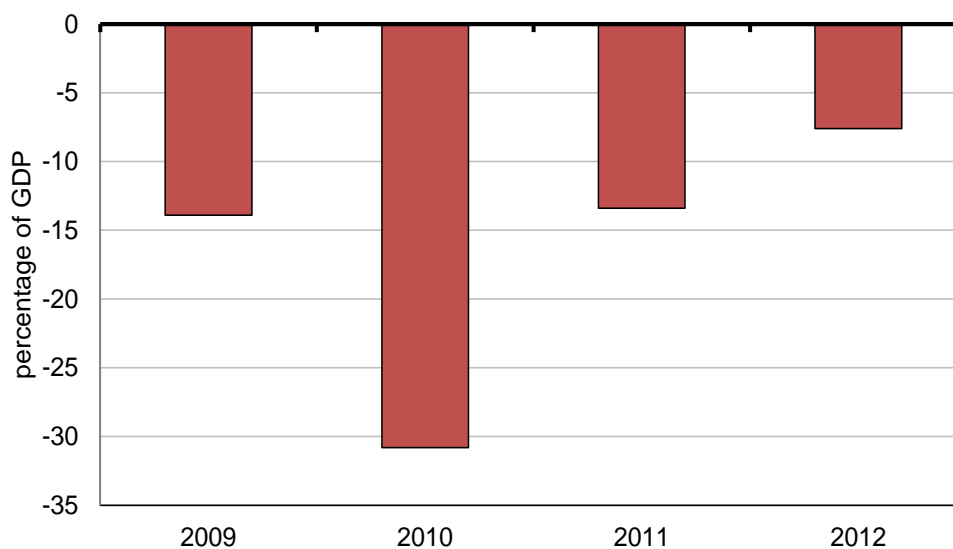
Source: Central Statistics Office, *Government Financial Statistics.*

Since the summer of 2008 the Irish fiscal position has deteriorated very rapidly. Beginning in autumn 2008, the authorities responded to this deterioration with a series of very tough budgets designed to stabilise the deficit. The speed with which the deficit widened, even in the face of the fiscal tightening, warranted a supplementary budget in the spring of 2009 and it was not until 2010 that the measures undertaken were sufficient to see the deficit stabilise. Table 2.1 summarises the *ex ante* measures undertaken and planned. As discussed above, in November 2010 the Irish government agreed a package of loans from the EU/IMF designed to help fund Irish debt over the period 2011-2013. That agreement incorporated the government's existing plan that mapped out a further package of medium-term measures designed to bring the deficit below 3 per cent of GDP by the middle of the decade.

TABLE 2.1   The Fiscal Adjustment, € billion

	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Revenue	0.0	5.6	0.0	1.4	1.6	1.4	1.1	0.7	11.1
Expenditure	1.0	3.9	4.3	3.9	2.2	1.9	2.0	1.3	19.2
of which capital:	0.0	0.6	1.0	1.9	0.8	0.6	0.1		5.0
Total	1.0	9.4	4.3	5.3	3.8	3.4	3.1	2.0	32.3

Source: Department of Finance, various.[6]

Roughly two-thirds of the actual and planned fiscal package relates to cuts in expenditure, both current and capital. In 2009 and 2010 significant cuts in public service pay levels were introduced, equivalent to up to 15 per cent of gross salary. There have also been very large cuts in expenditure on capital projects. On the revenue side, taxes on income have risen substantially in these years (Callan, *et al.*, 2013a).

The very tough fiscal packages that have been implemented have been strongly pro-cyclical, involving very large cuts in expenditure and increases in taxation, at a time when output was falling rapidly. The measures implemented over the period 2009-2013 amounted to an *ex ante* adjustment of €26 billion[7], or 16% of GDP. In addition to these measures already undertaken, a further adjustment of €5 billion is due to be implemented in 2014-2015.[8] In total this is equivalent to an adjustment of approximately one-fifth of GDP, an unprecedented programme of contractionary fiscal measures that has reduced output, employment and incomes in the economy.

In understanding the recent experience of the Irish economy it is important to assess how much of the weakness in economic growth was directly attributable to the necessary tightening of fiscal policy and how much to other factors, external and internal. In turn, this decomposition can help us understand how the economy may perform in the next few years, as the contractionary stance of fiscal policy is eased. Appendix 2 describes how this decomposition was undertaken using the *HERMES* model.

This analysis should not be taken to suggest that a neutral budgetary policy was a feasible policy option. On the contrary, it is absolutely clear that the fiscal

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[6]   For 2008-2010 *Report of the Review Group on State Assets and Liabilities.* [Table 2.1: Budgetary Adjustments since mid-2008 – Planned Budgetary Impact.] For 2011 and 2012 *Budget 2011*, *Budget 2012*, *Medium Term Fiscal Statement*, November 2012 Table 2.1. The figures included show the full year effects, including carryover, and exclude once-off measures. For 2013-2015 figures from *Medium-Term Fiscal Statement*, November 2012 Table 2.1.

[7]   See Kearney (2012) for details.

[8]   *Irish Stability Programme Update* April (2013), page 6.

adjustment undertaken was the minimum necessary to ensure that the government could raise funding to cover the continuing massive deficit. Without the intervention of the Troika and other EU partners who provided essential funding, a much more brutal adjustment would have proved essential. Unfortunately, because of the funding problems there was no choice but to implement this strongly pro-cyclical fiscal policy.

Table 2.2 presents an overview of the impact of the necessary fiscal tightening over the last four years. The results suggest that the cumulative effect of contractionary fiscal policies since 2010 has been to reduce the growth rate over the period by between 0.75 per cent and 1 per cent a year so that, by 2013, the level of both real GDP and GNP were between 3 and 3½ percentage points lower than they would have been under a "neutral" fiscal policy. The estimated effect of fiscal tightening has been particularly severe on domestic economic activity, with a reduction in the level of consumption by 2013 of up to 7 percentage points relative to the base levels. By contrast, the results suggest that the fiscal adjustment has had a negligible effect on exports. The cumulative effect on the unemployment rate has been to raise it between 1.5 and 2 percentage points in 2013.

Table 2.2   Full Fiscal Indexation from 2010 Onwards: Effect on Main Aggregates

		2010	2011	2012	2013
GDP	%Δ	0.9	2.0	2.8	3.2
GNP	%Δ	1.0	2.1	2.8	3.4
Total employment	%Δ	0.7	1.4	2.4	3.5
Unemployment Rate (ILO)	Δ	-0.5	-1.0	-1.2	-1.7
Current account of BOP as % of GDP	Δ	-1.8	-3.8	-5.1	-5.7
General Government Deficit as % of GDP	Δ	1.5	4.7	6.0	6.0
General Government Debt as % of GDP	Δ	0.9	4.8	10.4	16.0

The aggregates in Table 2.2 highlight the significant costs to the economy of the fiscal tightening. However, the table also includes key public finance aggregates that provide a stark estimate of the possible costs that would have resulted from a failure to implement the austerity programme from 2010 to 2013. By 2013 the General Government Deficit would have been 6 percentage points higher than it actually is – something that would clearly have been completely unsustainable.

This simulation shows that there was simply no choice but to undertake a fiscal adjustment along the lines implemented since 2009. Even if funding had been available to postpone the adjustment, the costs of delay would have been huge, reflecting the exceptional interest rates that would have been charged on any

funding that might have been available. In practise, as we saw in the autumn of 2010, funding was not available at any realistic interest rate, so that a neutral fiscal policy was never feasible, even if the government had wished to exercise such an option.

This simulation does, however, show that the effect of the tough fiscal adjustment over the last five years has been to knock nearly one percentage point a year off the growth rate in 2010-2013. The effects were particularly severe on domestic demand. This suggests that in future years, when the contractionary fiscal policy ends and deleveraging is complete, a more robust response from domestic demand can be expected, adding to growth.

2.6   Conclusions

The key problems that the Irish economy faces today as a result of the crisis are a high level of indebtedness of both households and government, a very high unemployment rate and a fragile banking system. In turn, these problems have combined to have a serious negative impact on the standard of living of the population as a whole (Box A). Although our analysis shows that the large-scale fiscal consolidation implemented since 2008 has lowered economic growth and resulted in higher unemployment, it was essential in order to stabilise the escalating deficit and debt.

In the following chapters, we describe a number of different paths which the economy could follow over the next decade, based on a range of differing assumptions about the external environment, fiscal policy, demographics and the banking system.   Underpinning each scenario is the need to unwind the imbalances in the economy that remain following the crisis. As will be illustrated in later chapters, the degree to which policy succeeds in addressing the imbalances, both in the public finances and the banking system, will have a key bearing on whether the economy can return to solid growth within a reasonable timeframe. Such a return to growth is the fastest and most clear-cut way to address the other problems discussed in this chapter, namely, the over-indebtedness of the household sector and the increase in poverty among those who have lost their jobs as a result of the downturn.

Chapter 3

Overview of Medium-Term Scenarios

3.1   Introduction

When considering the possible future path that the Irish economy may follow over the coming decade it is essential to consider the nature and extent of the uncertainty about this path. From the standpoint of 2013 there is a wide range of possible trajectories that the economy could follow. However, to provide a useful guide to policymakers it is important to put some structure on these future possibilities, a structure that suggests what may be the more probable range of outcomes and a structure which can identify how public policy can enhance the possibility of favourable outcomes.

When preparing past *Medium-Term Reviews* the approach to the uncertainty inherent in all forecasts was to first prepare a benchmark forecast and then to consider a wide range of possibilities around that benchmark. This assumed that the likely outturn would fall within such a range of outcomes, with the benchmark "centered" within that range. However, the current crisis has proved rather different in nature. Economists characterise the possible outturns in the current crisis in terms of "multiple equilibria" – there are possible widely different outcomes, which could lead to a number of alternative benchmarks. Moreover, depending on the trajectory the economy takes in the near term, the final destination may be very different. Under these circumstances the likely outturn in a decade's time will be one of these alternatives, not some middle path. The task of policymakers is to try to ensure that the economy follows the more favourable of alternative future trajectories.

From an Irish point of view a key feature of the current crisis, which has given rise to possible multiple equilibria, has been the issue of the sustainability of the Irish level of debt. In 2010, once the markets feared that the debt was unsustainable, even very high interest rates could not reward investors for taking the risk of lending to Ireland; such very high interest rates, in turn, made future default more likely. Without some outside intervention default would have been highly probable. However, EU policymakers moved to reassure markets by providing extensive funding to Ireland at a low cost. This moved the Irish economy back onto a sustainable path.

However, considerable uncertainty still remains about the future sustainability of the Irish economy. If the EU economy were not to return to growth in the foreseeable future, like the zombie economy of Japan in the 1990s, then the Irish economy would remain in a very vulnerable situation. Under these circumstances a small shock could push the economy into a downward spiral, where absence of growth would result in rising debt levels and rising debt levels, in turn, would render future growth even more unlikely. As discussed in this *Review*, such an outcome cannot be ruled out. Thus policymakers, both in Ireland and the wider EU, have further work to do to ensure that the Irish economy (and also the wider EU economy) is firmly set on a path to recovery.

In this *Review* we develop three scenarios in some detail and consider their implications for the Irish economy over the rest of the decade. Figure 3.1 summarises the difference in the assumptions underlying the three scenarios and it also gives the names we use to refer to them in the text. The two dimensions we explore in the scenarios are uncertainty about an EU recovery and uncertainty about the response of the Irish economy to the external environment.

FIGURE 3.1   Scenarios

Assumptions	European Recovery	European Stagnation
Domestic Adjustment	Recovery	Stagnation
Delayed Domestic Adjustment	Delayed Adjustment	

In Section 3.2 we outline the key characteristics of these scenarios. In Section 3.3 we describe the methodology we have used to elaborate each of them and Section 3.4 provides an overview of the results of this analysis.

3.2   Three Scenarios

We first consider a scenario where the EU economy returns to growth in the next two years and, as a result, the Irish economy could begin to grow at a reasonable pace over the second half of the decade. Such a course of events would see the burden of the Irish debt falling over time, allowing for further progress in later years. This could lead to a "virtuous circle", where the growth would help reduce indebtedness and unemployment and these improvements would, in turn, fuel further growth. We refer to this as the *Recovery* scenario.

Under this scenario, the external environment for business operating in Ireland would show considerable improvement compared to the current situation. With a return to growth in Europe and a gradual improvement in the European labour market, the European Central Bank (ECB) would gradually raise interest rates over

the second half of the decade. This action would be taken to forestall an increase in the rate of inflation above its target level in the Eurozone. From an Irish point of view, the return to growth in the European economy would be particularly welcome as the economy is very highly "geared" relative to growth in the world economy, including the European economy (see Chapter 6). If accompanied by an appropriate domestic policy stance, this return to growth would produce a domestic recovery. While interest rates would eventually rise, the negative effects of higher interest rates on the economy would be more than offset by the positive effects of higher world growth.

The second scenario which we consider is also predicated on an EU recovery. However, a range of possible factors could result in such a recovery in the outside world failing to translate into reasonable growth in Ireland. For example, domestic policy mistakes could prevent or delay an Irish recovery. One of the most obvious dangers is a failure by Irish policymakers to tackle effectively the continuing problems in the Irish financial sector. This could result in a shortage of credit preventing a recovery, possibly combined with further losses in the financial system adding to the economy's woes. Even if domestic policy is successful in tackling these dangers, the continuing problems in the financial sector might prove too difficult to overcome in the next few years. Another possibility is that the tradable sector could suffer a shock, either as a result of changes abroad adversely impacting on the corporation tax regime, or else because of technical change at a world level rendering some key sectors of the economy globally uncompetitive. Finally, hysteresis in the labour market would imply a much slower reduction in unemployment than in the *Recovery* scenario, with negative consequences for the growth in potential output. To explore the possible impact on the economy of one of these adverse events we examine what we characterise as a *Delayed Adjustment* scenario. In particular, we consider the effects of a possible failure, for whatever reason, to restore the financial sector to normal working within a reasonable period.

The third scenario which we consider is one where the EU economy, and hence Ireland, stagnates for the rest of the decade. While such an outturn for the EU may be less likely than a return to growth, it still remains a very real possibility. It is such an outturn that we consider in the *Stagnation* scenario.

Under this scenario we consider the possibility that Europe pursues a rather zombie-like course over the rest of the decade, similar to that of Japan in the 1990s. This would see little or no growth in the EU economy. Such an outcome could be produced through a number of mechanisms. A failure of the EU economy to return to growth could happen due to a prolonged implementation of a deflationary fiscal policy across the EU over the next four years

(EUROFRAME, 2013). It could also happen due to major problems with the Eurozone financial system, resulting in major credit constraints across the Eurozone. It could also arise because the growth in potential output in the Eurozone proved to be much lower in the future than was previously anticipated.

In the case of the first two possible reasons for a stagnant Europe, it would be likely that the lack of growth would also be accompanied by low interest rates. Because the Eurozone economy would be operating well below its level of potential output there would be little danger of inflation. For the purpose of this scenario we adopt the third assumption – that the growth in European potential output is close to zero. We implemented this scenario for Europe using the *NiGEM* world model. Under these circumstances, there would still be a danger of inflation, even with very limited growth and, hence, the ECB would tend to raise interest rates in the medium term. This scenario would also have negative implications for growth in Europe's major economic partner, the United States. Such a scenario would be particularly unfavourable for Ireland. We use this particular set of external assumptions as a basis for developing a detailed scenario, illustrating what might go wrong in the EU over the rest of the decade, with serious consequences for Ireland.

A further possibility is that the Economic and Monetary Union could collapse. While that might have seemed a real possibility over the last few years, it now looks like an unlikely, though not impossible, outcome. The action of the President of the ECB in July 2012, announcing the ECB's commitment to taking whatever action was needed to ensure EMU's survival, has clearly had a very important impact in calming the markets. The reason that a collapse seems unlikely is also that exit for all members could prove very costly (Åslund, 2012; Buiter, 2011). For major creditor countries, such as Germany, their currency would increase in value on exit making them much less competitive. In addition, a significant portion of their financial foreign assets (e.g. credit position with the ECB) would still be denominated in euro whereas their liabilities would be denominated in their new stronger domestic currency. This would mean that exit would be likely to result in an immediate large capital loss denominated in their new domestic currency.

For a weak country exiting, their new currency would be likely to fall greatly in value. While this would make them more competitive, all the evidence suggests that it would take many years before the benefits of this improvement in competitiveness would result in a major increase in output. Meanwhile their liabilities would be denominated in euro and their assets in the new weak currency, resulting in a major increase in their debt burden. For these reasons,

among many others, there is a strong incentive for all members to make EMU work.

A collapse in the euro would have huge knock-on effects on the economy, disrupting normal trading relations. Through its impact on the financial system, a collapse would affect all economic activity. The magnitude and nature of the resulting problems would be likely to be so great that existing models of the economy are not well designed to analyse possible outcomes. As such an event now seems very unlikely (though not impossible), we are not going to try and analyse the possible consequences of a collapse of EMU for Ireland or other countries in any detail in this *Review*. Suffice it to say that such an outcome would be much worse than even the worst scenario considered here. The obvious implication for policy is that all EU governments should take any necessary action to avoid such a destabilising outcome for all of Europe.

Thus, in this *Review* we confine ourselves to examining three scenarios for the Irish economy over the rest of the decade. As explained earlier, the likely outturn may be expected to lie in quite a wide range around one of these scenarios. These "ranges" of possible outturns may not overlap in the middle – hence it would not be appropriate to characterise the most likely outturn as some average of these three "equilibrium" scenarios.

3.3   Methodology

In preparing the scenarios in this chapter we have used data based on *National Income and Expenditure,* 2010 (NIE10). This has proved necessary as a full set of data based on NIE11 was not available when the *HERMES* model was being estimated in 2012. This means that the data for 2010-12 are not fully updated for recent data revisions. Instead an ad hoc approach has been used in calibrating to the latest national accounts data for 2010-12.

More important than the fact that some data revisions are not included is the fact that NIE10 was prepared using the EU NACE Rev 1 definitions of different sectors rather than NACE Rev 2. For example, this means that much of the software sector is still classified in manufacturing. However, in the latest version of the national accounts (NIE11) this sector is classified as part of the distribution sub-sector in market services. These differences in definitions must be taken into account when reading the discussion of sectoral output in the scenarios. In this *Review* the manufacturing sector still includes much of the more advanced tradable sector output that has migrated to market services in the 2011 National Accounts. It also means that, using data from the 2010 National Accounts under

NACE Rev 1 definitions, a substantial proportion of the manufacturing sector's output is exported as services rather than as merchandise exports.

In presenting the results of the scenarios we generally show detailed numbers to 2020 and discuss these results in the text. The exception is the *Delayed Adjustment* scenario where we concentrate on the period to 2018 – the period of delayed adjustment. As well as presenting the results to 2020 we provide some summary numbers for the period to 2030 in the Tables. However, while generated by the model, these numbers are clearly very tentative in nature and they are only included to indicate the possible direction of change after 2020.

In preparing these scenarios we have used the latest version of the *HERMES* macro-economic model for the Irish economy.[9] This model is used as a tool to elaborate the basic scenarios. As the model encapsulates very valuable information on how the economy actually behaves, it ensures that the scenarios are generally consistent with economic theory and the latest research on the economy.

The model is first used to prepare preliminary scenarios and then these are modified to take account of a wide range of additional information that has become available since the model and the related national accounts base were finalised. There are aspects of the economy which are not fully incorporated into the *HERMES* model where the authors' judgement remains a very important input. In particular, the financial sector is not adequately captured by the latest version of *HERMES* and additional modelling work has been needed to take account of its role in the development of the economy over time. These insights are then incorporated into a second set of simulations using the model to generate the final scenarios described in this chapter.

Using a formal macroeconomic model, that captures most of the key mechanisms driving the economy, is very important in elaborating medium-term scenarios. It ensures that the scenarios are consistent with economic theory. It also ensures that all the different sectors and variables are internally consistent. Without such a tool these "experiments" in how the economy would behave under different circumstances would have little validity. For example, without a suitable model it would not be possible to estimate the "structural" deficit for a particular year, as is done later in this *Review*. The new version of *HERMES* has a number of new or

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[9] Earlier versions were documented in Bradley, J., J. FitzGerald and I. Kearney (1993b) and Bergin, A., J. Cullen, D. Duffy, J. FitzGerald, I. Kearney, and D. McCoy (2003). A description of the current version of the model is given in Bergin *et al.* (2013).

improved features which have proved very important in elaborating the different scenarios in this *Review*.

The risk premium on Irish government borrowing is determined within the model (See Box B). It is a function of the level of debt and government borrowing. On the previous occasion we prepared medium-term scenarios, in the absence of a suitable mechanism in *HERMES*, the dependence of the risk premium on key variables had to be incorporated into the simulations in an ad hoc fashion (Bergin *et al.*, 2010b).

Consumption by households is now modelled as a function of permanent income. Thus it is affected by housing wealth and financial wealth in the model. This suggests that when housing wealth falls, households save more until their net financial wealth offsets the change in the housing wealth. This helps calibrate the deleveraging process by households which is under way in the economy today. This mechanism is discussed in more detail in Chapter 6.

The model of the manufacturing sector takes account of the fact that the volume of inputs of goods, and especially of services, has been rising rapidly. The direct effect of a rise in domestic costs on gross output is significant but not very high. However, a rise in domestic costs leads to substitution of (generally foreign) inputs of goods and services for domestic capital and labour. Through this mechanism changes in the domestic cost base have a much bigger effect on GDP and employment than through the effects on gross output. The cost of capital, as well as labour costs, affects the value added in the sector in Ireland.

Box B: The Risk Premium in HERMES

Nuša Žnuderl

An important new mechanism in this version of *HERMES* is the endogenisation of the government risk premium relative to German interest rates. The interest rate on Irish government borrowing is affected by a range of factors. First, there are the factors that affect the interest rate of "safe" Eurozone bonds, such as German bonds. Then there are the factors that determine the Irish risk premium relative to those "safe" bonds.

Since the advent of EMU until the onset of the crisis, the Irish risk premium (relative to Germany) was close to zero (see Figure B1). However, as the crisis began, and Irish government borrowing and the debt level rose dramatically, the risk premium also rose. There are a number of explanations suggested as to why risk premia rose so sharply in recent years. The core explanation is the role of macroeconomic fundamentals, where the risk premium rises in line with the

levels of debt and the deficit (measure of the rate of change in debt levels) facing an economy.

However, macroeconomic fundamentals are not sufficient to explain large, discrete changes in the risk premium, at a time of widespread financial crisis and contagion. In the Irish case, an additional explanation for the discrete spike in the risk premium in 2010 would include announcements of bank rescue packages, which transferred risk from the private sector to the government (Attinasi *et al.,* 2010). Further, Gunn and Johnri (2013) argue that the sovereign risk premium rises as countries move closer to an expectation of default.

The risk premium is also affected by factors outside Irish control. Towards the end of 2010 the promise of €67.5 billion in relatively low cost funding from the Troika calmed markets and reduced the risk premium for Ireland. Again in July 2012, the intervention of the President of the ECB calmed financial markets, bringing about a very significant reduction in the risk premium for Ireland, Italy, Spain, Portugal and Greece. In both cases the risk premium was on a trajectory that could have resulted in the cost of funds becoming prohibitive, but the intervention of EU policymakers shifted the trajectory onto a sustainable path.

Finally, experience of the last few years has shown that contagion can happen in the financial markets. Problems in one country, for example, Greece, can result in an increase in the risk premium for Ireland and other vulnerable countries.

The empirical evidence to date suggests that there is a non-linear relationship between risk premia and expected debt levels (Corsetti, Kuester, Meier and Muller, 2012). In addition, as the experience of Ireland, Greece and Portugal showed, above a certain level of borrowing and debt, the risk premium can rise exponentially, so that funding is effectively unavailable.

Thus, modelling the risk premium is a complex task. For the purposes of the *HERMES* model we have developed a calibration of the risk premium for Ireland as a function of government borrowing and government debt. While this is an undue simplification of the real world, it does capture a critical mechanism through which domestic fiscal policy action can have consequences for the risk premium. Many recent studies emphasise the trade-off for countries with public debt crises between corrective fiscal policy action, which has negative consequences for the economy, and reductions in sovereign debt risk, which help stabilise debt (Muller, 2013). We use this calibration in the scenarios we develop in this *Review* as we believe that it is preferable to recognise that domestic fiscal policy can have consequences for the risk premium rather than to assume that there are no consequences.

Calibration

The interest rate on borrowing paid by the government in Ireland (r_{IRL}) is, in principle, the sum of two components (Equation 1). The first component is the

risk-free interest rate paid by Germany (r_{GER}), a state with essentially no risk of default on its debt. The second component is the risk premium ($\Pi_{IRL,GER}$). This is defined as the cost of borrowing incurred by the government of Ireland that is over and above the risk-free interest rate incurred by Germany ($\Pi_{IRL,GER}$).

$$r_{IRL} = r_{GER} + \Pi_{IRL,GER}$$

FIGURE B1: Risk Premium for Irish 10 year Government Bonds Relative to German Bonds (%)
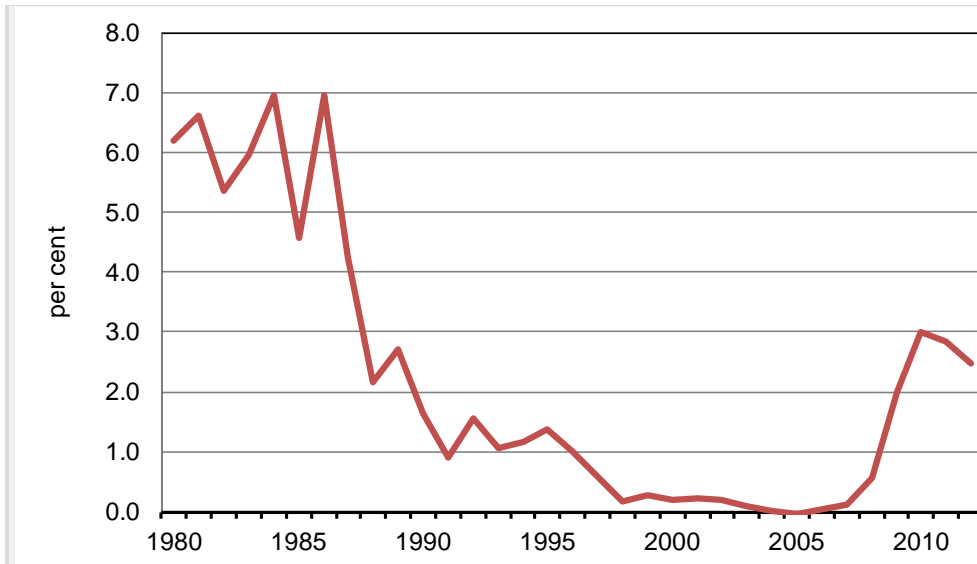
Modelling the risk premium in *HERMES*-13

The risk premium on Irish government debt represents financial markets' perception of the risk that the government of Ireland would default on its debt obligations.[10] In other words, the risk premium is the markets' collective assessment of the sustainability of Irish public finances. Accordingly, the risk premium on Irish government borrowing has fluctuated substantially over the last thirty years. In the 1980s, with high borrowing, high debt ratios and an independent exchange rate, the risk premium was high (Figure B1). However, over the 1990s the economic success of Ireland and the move to EMU brought down the risk premium by the end of the decade (Baker, FitzGerald and Honohan, 1996; Conefrey and FitzGerald, 2010). The risk premium remained low during the period to 2006, but it rose dramatically from 2008 in the face of the collapse of the economy and the dramatic increase in government indebtedness.

Past experience elsewhere shows that beyond a certain threshold, adverse movements in the public finances have consequences for the risk premium. Experience in the 1980s showed that fiscal tightening, *ceteris paribus*, was likely to reduce the interest rate paid by the Irish government, while a failure to tackle fiscal problems would be likely to increase the risk premium. Since Ireland joined

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[10] Measured as the gap between the yield on Irish and German ten-year government bonds.

EMU, the risk premium remained low as long as the debt-to-GDP ratio remained below 60 per cent. However, once the public finances experienced a very severe deterioration in 2008, the risk premium rose rapidly.

In Bergin *et al.* (2010), the potential impact on the risk premium of different fiscal policy options was modelled using discrete changes in the risk premium based on limited evidence. Using past experience and the experience of the current crisis, a more systematic calibration of this effect has been implemented in *HERMES-13*. This calibration should not only capture the rise in the risk premium to 2011; it should also handle an unwinding of the premium in an appropriate manner as the problems with public finances are gradually resolved. To this end we combine data since 2005 with the Department of Finance/NTMA assumptions about nominal GDP, borrowing and debt out to 2015 and we use these data to calibrate a model of the risk premium.

The risk premium in each year is modelled as a simple function of the government borrowing in the previous year (expressed as a percentage of GDP), RGBR, and of the debt-to-GDP ratio, RGGD. Government borrowing includes the cost of financing the banking system, a very important factor in the loss of confidence in the Irish economy over the period 2008-11.[11]

According to this calibration, a 1 per cent increase in the previous year's government borrowing as a percentage of GDP will increase the risk premium by 0.15 per cent, while a 1 per cent increase in debt-to-GDP ratio will increase the risk premium by 0.02 per cent. This calibration tracks the rise in the risk premium reasonably well to its peak, as well as the recent fall in 2012 (Figure B2).

The calibration implies that with a debt/GDP ratio of 60 per cent and an elimination of the government deficit, the risk premium would fall to 1.5 per cent. While this might seem high by historical standards, it is nonetheless a plausible calibration in the current economic context.

This new equation is used in the *HERMES* model to provide a calibration of the effects of changes in the public finances on Irish government interest rates (Figure B2). In turn, this interest rate has a significant feed-back effect on the economy, both through its effects on government debt interest payments and through its effects on interest rates for the private sector.

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[11] This approach abstracts from the possibility that there are multiple possible equilibria for the economy: one where interest rates are very high, making default likely, and another, where interest rates remain low, making it unlikely.

FIGURE B2: Government Risk Premium: Actual vs. Fitted Values
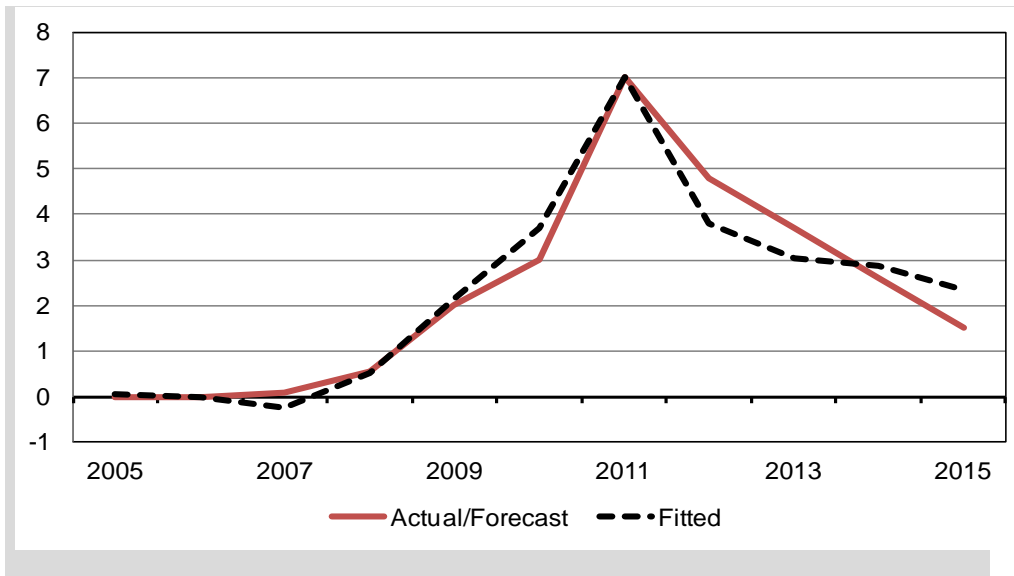
The modelling of the government debt has been improved to take account of changes in new funding mechanisms (e.g., the EU EFSF, the IMF etc.).

Any model of an economy is limited in nature. It also embodies a lot of judgement by its authors. Thus, there is no model that is absolutely correct. The *HERMES* model has evolved over time to take account of the changing structure of the Irish economy. When the model was first used in a *Medium-Term Review* in 1987 the economy looked very different from today. Unfortunately, the detailed elaboration of government debt and its consequences in the 1987 version of the model has acquired a new relevance. Probably the key feature of today's model, that is based on the 1987 version of the model, is the pre-eminence given to modelling tradable output as the medium-term driver of growth in the open Irish economy.

In addition to the *HERMES* model we use the UK National Institute for Economic and Social Research world model *NiGEM* in order to understand how changes in the outside world will affect Ireland. For example, a change in oil prices may have a bigger effect on the Irish economy through its effects on ECB interest rate formation than directly through changing the Irish terms of trade. Without a world model these very important additional mechanisms would not be captured in our analysis. The *NiGEM* model is used to generate the EU *Stagnation* scenario set out below.

As in previous *Reviews*, we make extensive use of the ESRI's Demographic Model. This model is important in understanding how the supply of labour will change in

the future, what will be the change in the size of the dependent population and what will be the effect of demographic change on the demand for housing.

Finally, in the scenarios set out in this *Review* we suggest a particular annual pattern to the changes in the economy. However, while the *HERMES* model concentrates on the long-term equilibrium of the economy, there is less certainty attaching to the actual path of adjustment that is suggested. Also, even if the EU economy does return to growth, it is not clear exactly when that will take place. Thus the precise year by year timing of the changes in the economy, spelt out in the different scenarios, could, in reality, be rather different than shown in this *Review*, even if the final destination was rather similar. Recovery could happen earlier or later than the scenarios suggest. As a result, we pay more attention to the average changes over a number of years rather than to the year by year growth rates.

3.4   Summary of Implications of Scenarios

This section provides a brief overview of the medium-term implications of the three scenarios for the path of four important macroeconomic variables: real GNP, the ratio of the general government deficit to GDP, the debt to GNP ratio and the unemployment rate. The assumptions underlying these scenarios are outlined in Chapter 4 and the detailed results for each scenario are presented in Chapter 5.

In the *Recovery* scenario, real GNP growth averages 3.6 per cent from 2015-20 and the level of GNP regains its 2007 level by 2017 (Figure 3.2). In the *Delayed Adjustment* scenario, GNP growth averages around 3.2 per cent a year from 2015-20, almost 0.5 percentage points lower than in the *Recovery* scenario. In this scenario the loss of output is attributable to domestic policy failures. By 2018, the level of GNP would be over 6 per cent lower than in the *Recovery* scenario.

The economy grows at a much subdued rate in the *Stagnation* scenario, with growth averaging just over 1 per cent from 2015-20. The size of the economy, as measured by real GNP, would remain smaller than in 2007 out beyond 2020.

FIGURE 3.2   GNP, Constant Prices, Under Three Different Scenarios
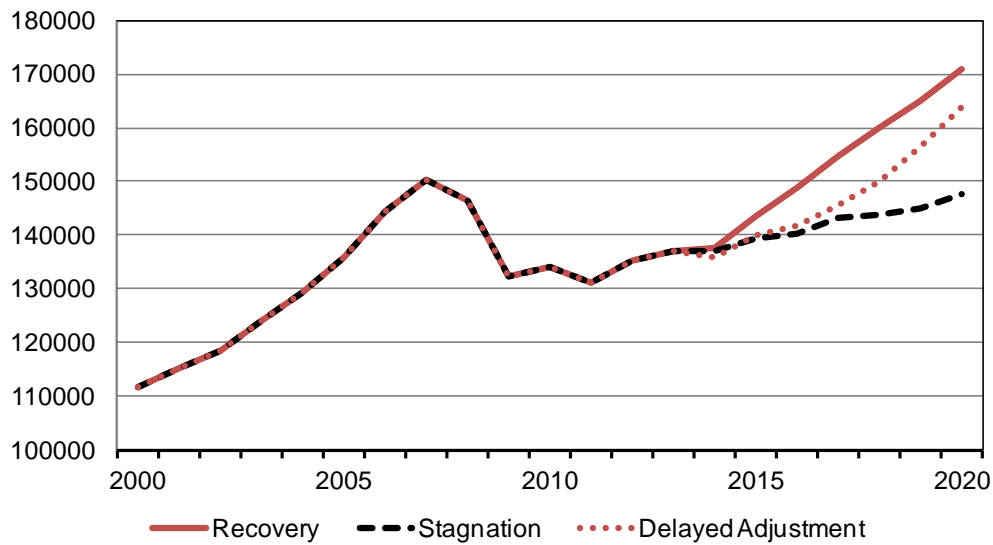
FIGURE 3.3   Government Deficit/GDP Ratio, Under Three Different Scenarios
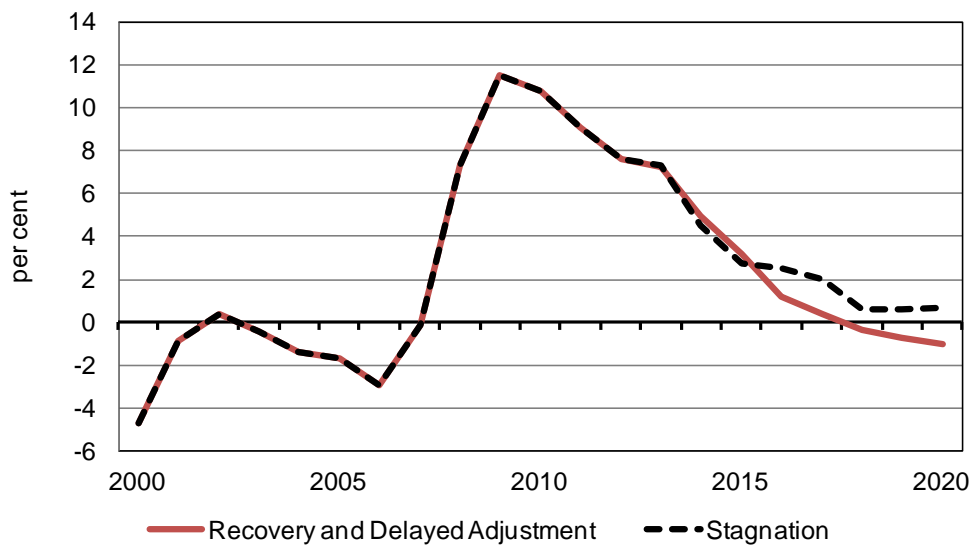
The assumed implementation of the remaining planned fiscal consolidation for 2014, as well as a return to growth in the *Recovery* scenario, would result in the general government deficit as a percentage of GDP falling to close to the 3 per cent Maastricht target by 2015 (Figure 3.3).[12] The government balance would be close to zero in 2017 and it would return to surplus in 2018. In the *Delayed Adjustment* scenario we have constrained the deficit/surplus to follow the same path as in the *Recovery* scenario. However, because of lower growth, this would require a tougher fiscal policy stance than in the recovery scenario. To simplify

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[12]   On the basis of numbers that have become available since we completed the scenarios, the deficit is likely to be significantly lower than 3 per cent of GDP in 2015. If achieved, such a reduced deficit would have knock-on implications for later years.

the modelling, we have assumed that a single fiscal instrument is used to achieve the target, in this case income tax. In the *Stagnation* scenario fiscal policy would need to remain contractionary for much of the rest of the decade because of the low growth. In turn, this pro-cyclical fiscal policy would further reduce growth, as shown in Figure 3.2. Even so a small government deficit would remain until the end of the decade, contrary to the current rules.

Reflecting the contrasting growth performances, the debt/GNP ratio would follow different paths under the three scenarios (Figure 3.4). In the *Recovery* scenario, the ratio would decline from its peak of 153 per cent in 2013 to around 100 per cent by 2020. In the *Delayed Adjustment* scenario, sluggish domestic demand, the need for an assumed further injection into the financial sector and higher debt interest payments would result in the debt GNP ratio remaining elevated for longer than in the *Recovery* scenario. It would peak at around 158 per cent of GNP in 2014 before falling to 106 per cent in 2020. Despite the implementation of large fiscal consolidation measures, low growth would inhibit the economy's capacity to reduce the debt GNP ratio in the *Stagnation* scenario. Government debt as a percentage of GNP would remain over 120 per cent, even in 2020. The persistently high debt levels in the *Stagnation* scenario would leave the economy exceptionally vulnerable to adverse shocks.

FIGURE 3.4   Debt/GNP Ratio, Under Three Different Scenarios
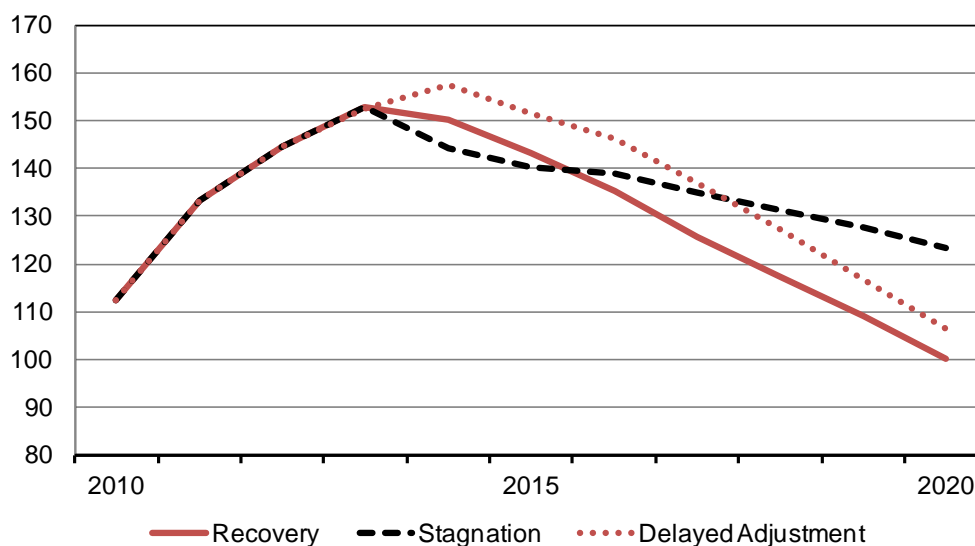
The return to growth in employment intensive investment and consumption in the *Recovery* scenario would see the unemployment rate decline gradually to just below 10 per cent by 2017 (Figure 3.5) and around 6 per cent in 2020. The labour market performance in the *Delayed Adjustment* scenario would be very unsatisfactory, with the unemployment rate remaining in double digits to 2019

and net emigration continuing for the rest of this decade. This would be consistent with hysteresis in the labour market arising from loss of skills and expertise among the long-term unemployed. Subdued growth in the *Stagnation* scenario would mean that employment would fail to regain its 2007 level over the period of the forecasts. Unemployment would fall slightly from 14 per cent, but it would still stand at 12 per cent in 2020, in spite of continuing emigration over the decade.

FIGURE 3.5   Unemployment Rate (ILO), Under Three Different Scenarios
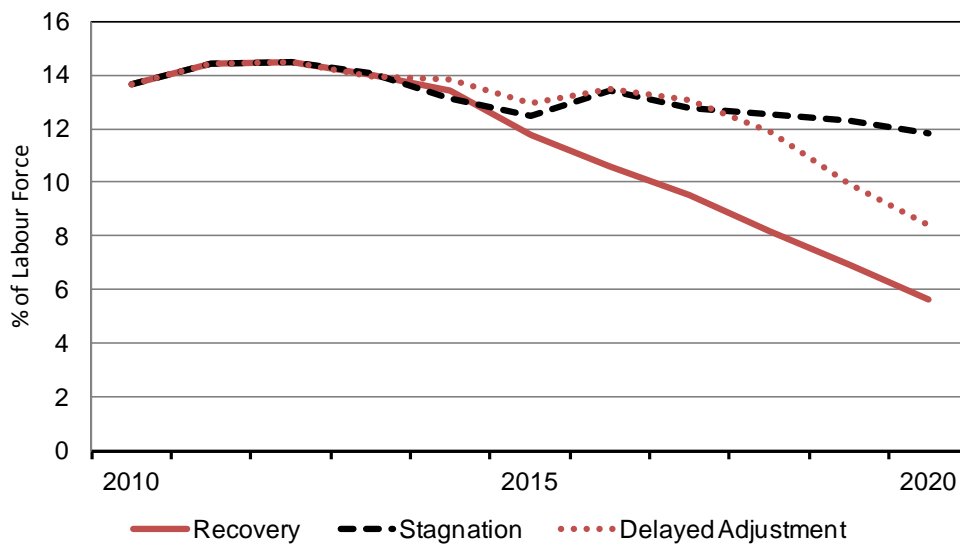
A turnaround in the economy of the type illustrated in the *Recovery* scenario would be needed to produce a serious reduction in the current high levels of debt and unemployment. However, domestic policy failures, or other factors that are not under government control could see the economy growing below potential, even with an EU recovery. Any underperformance in the economy over the coming decade of the type described in the *Stagnation* scenario would leave the economy teetering on the brink of sustainability. Any further shock to the economy under that (*Stagnation*) scenario could push the economy onto a trajectory where the level of debt began to rise again posing a risk to solvency.

Chapter 4

Assumptions

4.1   Introduction

The previous chapter outlined the three main scenarios for the Irish economy that are considered in this *Review*. This chapter describes the assumptions for the world economic environment, assumptions for fiscal policy and assumptions concerning demographic developments that underpin these scenarios and Chapter 5 considers the details of the scenarios.

4.2   World Economic Environment Assumptions

Forecasts for the world economy in the *Recovery* and *Delayed Adjustment* scenarios are based on the forecast for the world economy published in the *National Institute Economic Review* in January 2013.[13] An alternative forecast for the world economy is generated for the *Stagnation* scenario, which uses the *NiGEM* model to provide an external context where Europe fails to grow until the end of the decade.

The global forecast underpinning the *Recovery* and *Delayed Adjustment* scenarios envisages a return to growth in the EU economy next year (Table 4.1). However, the forecast suggests that EU growth will be slightly anaemic in character over the rest of the decade; growth between 2015 and 2020 would be lower than the growth in potential output, resulting in a continuing substantial level of unused capacity in the EU economy in 2020. It is only in the next decade that this slack would be eliminated in Europe. Nonetheless, by contrast with the last five years, it would be a much more favourable background against which the Irish economy could return to sustained growth. For the US, growth would show a rather similar pattern under this forecast. The growth in the US economy has greater significance for Ireland than for much of the rest of the EU, because of the importance of US investment in Ireland.

The price of oil is assumed to rise slowly in the forecast period (Table 4.1). When combined with the effects of excess capacity in the EU economy, this would mean that inflationary pressures would remain subdued. As a result, it is assumed that the ECB would raise interest rates very gradually, beginning in 2015 (as indicated by the German short interest rate in Table 4.1). The implications of this for the

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[13]   The May *NIER* quarterly was published after this scenario was completed. However, it did not make any major change in the forecast for the world economy compared to the January publication.

German bond rate are also shown.[14] With German bond rates approaching 4 per cent by the end of the decade, the Irish bond rate would be somewhat higher, depending on the risk premium then attaching to Irish borrowing. This domestic risk premium would be affected by the path of the Irish public finances.

TABLE 4.1   Recovery and Delayed Adjustment Scenarios – Assumptions on World Economic Environment

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2025	2030
Interest Rates, %											
German short rate	0.75	0.89	0.89	1.07	1.55	2.04	2.52	3.00	3.49	4.39	4.39
German bond rate	1.55	1.73	2.21	2.64	3.02	3.32	3.56	3.75	3.88	4.00	4.00
Exchange Rates (units of foreign currency per €)											
UK	0.81	0.82	0.81	0.81	0.81	0.81	0.81	0.82	0.82	0.82	0.82
USA	1.29	1.31	1.30	1.30	1.30	1.31	1.31	1.32	1.32	1.33	1.33
Growth Rate of GDP, %											
EU-15	-0.3	0.1	1.1	1.5	1.7	1.9	2.0	2.1	2.2	2.3	2.1
UK	0.0	0.7	1.5	2.1	2.3	2.3	2.2	2.4	2.6	2.9	2.4
USA	2.2	0.7	1.5	1.9	2.2	2.2	2.3	2.3	2.4	2.7	2.5
OECD	1.4	1.3	1.9	2.2	2.4	2.5	2.5	2.6	2.6	2.8	2.8
Germany	0.9	0.7	1.4	1.2	0.9	1.0	1.2	1.4	1.4	1.4	1.3
Consumers expenditure deflator, % change											
Germany	1.7	2.3	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1.2	1.4
UK	2.7	2.0	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.3	3.5
Wage Rates, %											
Germany	3.0	3.1	1.9	2.3	2.3	2.3	2.3	2.4	2.5	2.7	2.9
UK	2.0	1.8	2.5	2.7	3.0	3.3	3.5	3.6	3.6	4.1	5.4
Unemployment rate, % of labour force											
UK	7.9	8.1	8.0	7.3	6.8	6.5	6.5	6.5	6.4	6.0	5.4
Oil Price in $											
Price in $	110.5	103.9	98.1	98.0	100.0	102.0	104.1	106.2	108.3	119.7	132.3

This forecast sees key exchange rates showing little change over the period to 2020. The unemployment rate in the UK is forecast to fall gradually from 2015 onwards. However, the rate of unemployment in the UK, and elsewhere in the EU, is assumed to remain elevated out to the end of the decade. This means that the alternative labour markets in the EU for potential Irish emigrants would remain relatively unattractive for some time to come. The difference between the conditions on the Irish labour market and those in foreign labour markets is a key driver of future migration patterns.

For the *Stagnation* scenario, the *NiGEM* model was used to generate an alternative outcome where Europe fails to grow over the rest of the decade. In

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[14]   The NiGEM model ensures a consistent path for short-term and long-term interest rates.

this scenario it is assumed that the failure of the EU to grow would be because underlying productivity growth in Europe would be much lower than previously anticipated. In turn, this would imply that potential output would grow much more slowly than in the *Recovery* scenario (or would even fall). This would mean that there would be little if any growth in the EU for the rest of the decade. Because actual output would be in line with the low level of potential output, there would be no scope for offsetting action by the ECB. With the economy producing at "capacity," inflation would be possible even at low levels of activity. Hence interest rates would rise in Europe in the medium term in spite of weak economic activity.

TABLE 4.2   Stagnation Scenario – Assumptions on World Economic Environment

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2025	2030
Interest Rates, %											
German short rate	0.75	0.89	0.47	0.28	0.89	1.92	3.20	4.30	4.75	4.84	4.39
German bond rate	1.55	1.73	2.59	3.13	3.64	4.03	4.30	4.44	4.48	4.44	4.00
Exchange Rates (units of foreign currency per €)											
UK	0.81	0.82	0.75	0.76	0.77	0.78	0.79	0.82	0.84	0.83	0.83
USA	1.29	1.31	1.43	1.44	1.46	1.48	1.48	1.48	1.47	1.46	1.45
Growth Rate of GDP, %											
EU-15	-0.3	0.1	-1.1	-1.6	-0.4	0.2	0.4	0.7	1.2	2.2	2.1
UK	0.0	0.7	-2.7	-3.5	-0.9	0.2	0.6	1.2	2.2	2.9	2.4
USA	2.2	0.7	-0.1	-0.4	0.7	1.1	1.2	1.4	1.8	2.6	2.5
OECD	1.4	1.3	0.9	0.9	1.6	1.9	2.0	2.1	2.3	2.8	2.8
Germany	0.9	0.7	-0.3	-1.2	-0.7	-0.5	-0.3	-0.1	0.2	0.9	1.3
Consumers expenditure deflator, % change											
Germany	1.7	2.3	0.8	1.3	1.4	2.1	2.8	3.4	2.9	0.6	1.4
UK	2.7	2.0	0.2	2.4	2.2	2.2	3.3	4.7	4.1	2.0	3.5
Wage Rates											
Germany	3.0	3.1	0.6	0.8	0.9	1.6	2.4	3.8	3.4	1.2	2.9
UK	2.0	1.8	1.4	1.8	1.1	1.7	3.5	5.2	4.4	3.8	5.4
Unemployment rate, % of labour force											
UK	7.9	8.1	8.4	10.0	9.4	8.2	7.1	6.9	7.2	5.6	5.4
Oil Price in $	110.5	103.9	101.6	101.5	103.0	104.8	106.9	109.1	111.1	122.4	132.3

The poor performance in Europe would affect the rest of the world, including the US. Hence, there would be a significantly worse performance by the US economy than in the *Recovery* and *Delayed Adjustment* scenarios, and this would have a significant negative impact on Ireland. Because of the revised expectation about interest rates, the euro would be stronger relative to the dollar, which would affect European competitiveness.

Irish Fiscal Policy Assumptions

The assumptions adopted for fiscal policy in each of the three scenarios are discussed below.

In the *Recovery* scenario, we implement a stylised "post-crisis" fiscal stance from 2015 onwards. It is not intended to be normative but rather to produce a reasonably realistic possible trajectory for government borrowing (or lending), consistent with EU and Irish fiscal rules. The same trajectory for government borrowing is assumed in the *Delayed Adjustment* and the *Recovery* scenarios. The stylised fiscal stance assumed here aims to deliver a small fiscal surplus in the medium term (a general government surplus of between 0.5 per cent and 0.7 per cent of GDP)[15] consistent with public expenditure being around 40 per cent of GNP, slightly above the level chosen in the early years of the last decade. Many other trajectories would be possible, achieving broadly similar macroeconomic impacts. The detailed distributional and efficiency implications of such choices go well beyond the scope of this exercise and they are left for consideration by other authors.

While we outline below the detailed fiscal assumptions underlying these two scenarios, the one difference between them relates to the average rate of income tax. For simplicity, this instrument is used in the model to ensure that the fiscal target, set out above, is met every year. In the case of the *Recovery* scenario it changes little over the rest of the decade. However, in the *Delayed Adjustment* scenario, because of the lower growth rate and its effects on government borrowing, the average rate of income tax needs to rise by over a quarter in order to ensure the deficit/surplus target is met. In practise no government would be likely to choose such a large increase but, instead, would probably spread the necessary adjustment over many fiscal instruments. Nonetheless, it is used here for illustrative purposes.

To implement this broad fiscal strategy we assume that the planned €3 million (*ex ante*) adjustment is implemented in the 2014 Budget this autumn. However, we also assume that no further nominal expenditure cuts or discretionary tax increases are implemented after the 2014 Budget, but that the Budgets for 2015-17 still remain restrictive as a result of less than full indexation of expenditure for inflation (see Bergin *et al.*, 2013 for details of the indexation rules). This differs from the current Government strategy set out in the latest *Stability Programme Update*, which envisages further headline cuts of €2 billion in 2015.

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[15] Throughout this publication we quote government borrowing as a percentage of GDP because it is the commonly used measure. However, for most other purposes we quote the different economic aggregates as a percentage of GNP as this is a more appropriate welfare measure. IFAC have suggested an alternative composite measure which is more attractive from an economic point of view. However, as it does not have wide currency we do not use it here.

For 2018-20 we assume a broadly neutral fiscal policy, with full indexation of benefit rates, public service wage rates and excise taxes. Allowance is made from 2015 onwards for the effects of demographic changes on transfer payments.

Details of how this high level picture is translated into assumptions on the different components of expenditure and government revenue are given in Table 4.3. For the *Recovery* scenario, employment in the public sector and, hence, the volume of public authorities expenditure on goods and services, is assumed to be held constant in 2015 at 2014 levels, following on the substantial falls of recent years. Thereafter, numbers employed in the public sector are assumed to grow by 1 per cent a year in 2016 and 2017 and by 2 per cent a year thereafter, allowing for an improvement in public services. Public sector pay rates (including increments) are assumed to be unchanged in 2015.[16] In 2016 public service pay rates are assumed to grow by under 3 per cent, a bit more slowly than in the private sector. Thereafter, they are assumed to rise at the same rate as in the rest of the non-agricultural sector.

TABLE 4.3   Recovery Scenario and Delayed Adjustment Scenario – Fiscal Policy Assumptions

		2015	2016	2017	2018-20
Public sector employment	Volume	0	1	2	2
Government consumption	Price / wages	0	2.9	4.4	3.8
Transfers	Value	0	3.5	3.9	6.2
Capital expenditure, Roads etc.		0	13	9.7	6.1
Capital expenditure, Other		0	5	5	5
Excise taxes	Indexed	2.2	2.4	2.4	2.2
VAT	Constant				
Property Tax	Indexed				
Personal Tax, Recovery		20.3	20.3	20.3	20.3
Personal Tax, Delayed Adjustment		23.9	27.5	29.0	27.9
Capital revenue	Value	4	4	4	4

Rates of welfare payments are assumed to remain unchanged in 2015 in the *Recovery* scenario; with prices rising this would imply a further cut in real rates of benefit or changes in eligibility. Expenditure on unemployment transfers is assumed to move in line with the numbers unemployed. Expenditure on other transfers (pensions etc.) is assumed to be unchanged in 2015 on 2014. With numbers of beneficiaries rising this would imply a need for further tightening in conditions of entitlement. In 2016 and 2017 expenditure on this category of transfers is assumed to rise by between 3.5 per cent and 4 per cent a year. This would allow for indexation to prices and for the effects of changes in the number

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16   This would not allow for increments.

of recipients arising from demographic factors. Thereafter, rates of benefit are assumed to rise in line with wages and the number of beneficiaries is assumed to rise in line with the numbers aged over 65 in the population. In addition, provision is made for an additional increase each year of 1 per cent over the period 2018-20.

Public investment, other than in roads and water, is assumed to show no change in value in 2015 (a volume fall) and to grow by 5 per cent each year in value thereafter in the *Recovery* scenario. As the deflator for this investment would grow by around 4 per cent a year to 2020, this would result in a volume increase in these items of public investment from 2016 onwards. Government investment in roads and water is assumed to grow by 8 per cent a year from 2016-2020. While the deflator for this item would rise quite rapidly between 2015 and 2020, this would involve a continuing growth in volume in the *Recovery* scenario.

The *Recovery* assumptions would result in government capital expenditure remaining around 3 per cent of GNP each year for the foreseeable future,[17] slightly higher than the 2 per cent of GDP spent on public investment in many of the developed EU countries (the UK has tended to spend slightly less in the past). However, comparability of these investment figures may be affected by differences in the coverage of the public sector in different countries.

With the exception of income tax rates, other tax rates are assumed to be held constant in real terms from 2015 onwards in the *Recovery* scenario. Excise taxes are assumed to be indexed to prices, while VAT rates are held constant. Elsewhere, government capital revenue is assumed to rise by 4 per cent a year from 2015 onwards.

National debt interest payments are endogenous – they are determined by the stock of debt at the beginning of the year, interest rates on that debt and interest rates on new debt incurred. In the *HERMES* model the need to refinance debt each year is also taken into account. Nearly all new borrowing is assumed to be undertaken using 10-year government bonds. The interest rate on these new bonds is assumed to be equal to the forecast German bond rate for that year (Table 4.1) plus a risk premium for Ireland determined in the *HERMES* model. The resulting interest rates on German and Irish 10-year government bonds under the *Recovery* scenario are shown in Figure 4.1.

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[17] In the 1980s public investment was 3.5 per cent of GNP; it was 3.0 per cent of GNP in the 1990s and 4.5 per cent of GNP in the 2000s.
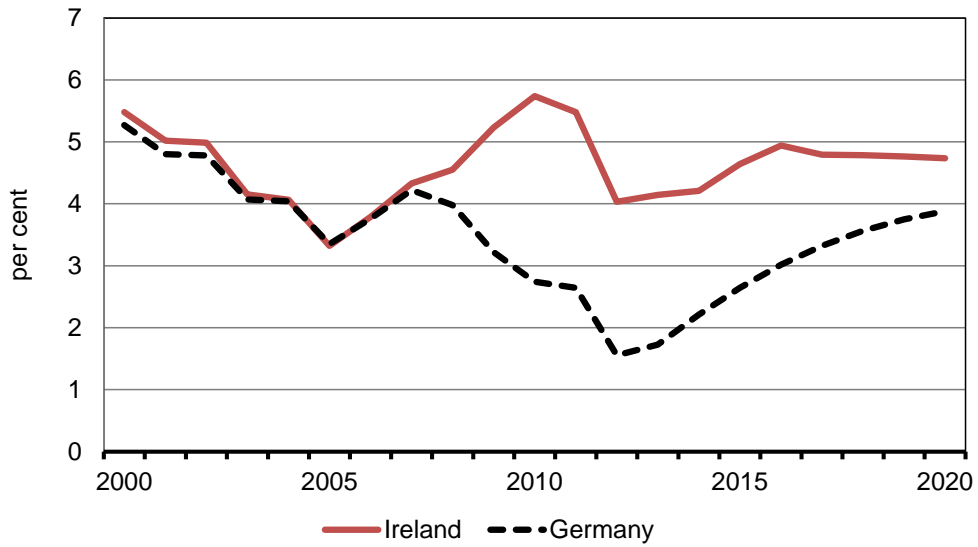
The *Stagnation* scenario would see the situation of the public finances remaining very challenging over the forecast horizon. The target for the general government deficit is set at a little over 0.5 per cent of GDP toward the end of the decade. As in the case of the *Delayed Adjustment* scenario, the technical assumption is made that the target for government borrowing is met each year by varying the rate of taxation on personal income by a suitable amount. In spite of a much reduced increase in the other key fiscal aggregates compared to the *Recovery* scenario (comparing Tables 4.3 and 4.4), the absence of significant growth in the economy would have a very negative effect on the public finances. As a result, from 2018 onwards there is assumed to be a substantial increase in the personal tax rate to keep the public finances to the target deficit. Overall, this would imply that the fiscal stance would be contractionary over the rest of the decade, albeit to a lesser extent than in recent years. Even if other fiscal instruments were chosen to ensure the target deficit was met, the effects would still be contractionary.

TABLE 4.4   Stagnation Scenario – Fiscal Policy Assumptions

		2015	2016	2017	2018-20
Public sector employment	Volume	0.0	0.5	0.5	0.5
Government consumption	Price/wages	0.3	2.2	2.8	3.1
Transfers	Value	0.0	3.5	3.5	3.5
Capital expenditure, Roads etc.		-1.2	5.2	8.9	2.6
Capital expenditure, Other		0.0	2.5	2.5	2.5
Excise taxes	Indexed	2.2	2.1	2.0	1.9
VAT	Constant				
Property Tax	Indexed				
Personal Tax	Average rate	20.3	20.3	20.3	23.8
Capital revenue	Value	4	4	4	4

Under this *Stagnation* scenario, there is assumed to be no change in employment in the public sector in 2015 and this is followed by a very small increase in numbers of 0.5 per cent a year thereafter (Table 4.4). Public sector wage rates are assumed to grow by 0.25 per cent in 2015 and by 2.25 per cent in 2016. Thereafter they are assumed to rise in line with non-agricultural wage rates.

As with the *Recovery* scenario, in the *Stagnation* scenario there is assumed to be no growth in other transfers (excluding unemployment payments) in 2015. Thereafter, they are assumed to rise by 3.5 per cent a year. Given the rising numbers of people over 65, this increase would imply that welfare rates would grow marginally slower than the rate of increase in prices. With the exception of investment in roads and water, which is assumed to show some real growth in 2016 and 2017, there is assumed to be no volume growth in the rest of public capital expenditure. Public investment, treated as an aggregate, is assumed to show very little change in volume between 2015 and 2020 under the *Stagnation* scenario.

With the exception of taxes on personal income, other tax rates are assumed to be held unchanged in real terms from 2015 onwards in the *Stagnation* scenario.[18]

The assumptions underlying the *Stagnation* scenario imply a continuing negative fiscal impulse over the forecast period. Even with this continuing deflationary stance of fiscal policy, the public finances would be only just about kept within a sustainable range. This range would be outside the limits set in legislation[19] but, as discussed later, it would still be just about enough to maintain the debt/GDP ratio on a slow downward trajectory.

As shown in Figure 4.2, the risk premium on Irish government bonds would be somewhat higher under the *Stagnation* scenario than under the *Recovery* scenario. In addition, as shown above in Table 4.2, German interest rates would also be higher by the end of the decade. The result is that while Irish bond rates would be below 5 per cent under the *Recovery* scenario in 2020, in the case of the *Stagnation s*cenario they would be 1.1 percentage points higher at 5.8 per cent in 2020. This enhanced risk premium is modelled in *HERMES* and it results from the much higher trajectory for the debt/GDP ratio in this scenario. With the economy on a knife edge of debt sustainability, a higher risk premium would be realistic. The consequence of higher interest rates would be that the

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[18]   For excise taxes this means that the rates are indexed to prices.
[19]   Both EU rules, such as the "six pack" and the "two pack", and the Fiscal Responsibility Act.

government's interest bill would also be higher, contributing to the need for a tighter fiscal policy.

FIGURE 4.2   Risk Premium on 10 Year Government Bonds
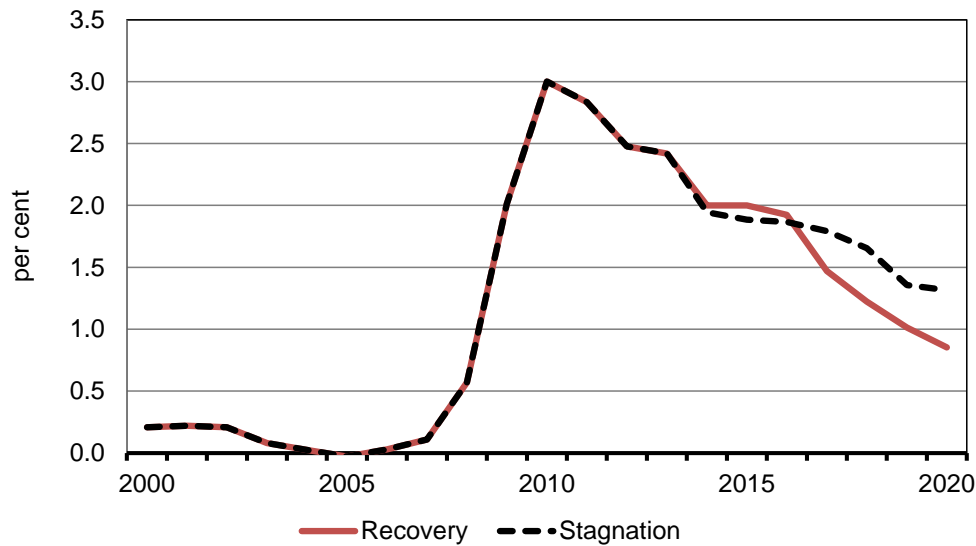
Assumptions about Demographics and the Labour Market

We use the ESRI's *Demographic* Model to consider the likely change in the size and structure of the population over the period to 2030. The model forecasts the population by single year of age, cross-classified by final level of education achieved. The assumptions about fertility and life expectancy are broadly similar to those made in CSO, 2013. These forecasts impact on the economy through a number of channels. Firstly, the overall size of the population, especially the population in dependent age groups, affects the demand for public services and also the level of government transfer payments. However, of more importance for the pattern of economic growth is the development of the labour force over the coming decade.

The labour force is affected firstly by the natural increase in the population in the relevant age groups, secondly by migration and thirdly by participation rates. As the bulk of migrants are of working age, a high level of emigration (or immigration) can have an important effect on the future labour force. The level of migration assumed in the *Demographic* Model is taken from the macroeconomic scenario developed using the *HERMES* macro-economic model (Table 4.5).[20] In Table 4.5(a) we show the common assumptions across the three scenarios concerning the Total Fertility Rate and Life Expectancy. We then show the differentiated assumptions for each scenario in panels (b) to (d). The differences

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[20]   The *HERMES* model and the Demographic model are run iteratively to reach a consistent scenario.

between the scenarios in the assumptions on the birth rate and the death rate arise purely because of the differences in the migration numbers.

TABLE 4.5   Key Demographic Assumptions

(a) All Scenarios

		1995	2000	2005	2010	2015	2020	2025	2030
Total Fertility Rate		1.8	1.9	1.9	2.1	2.0	2.0	2.0	2.0
Life Expectancy	Male	73.3	75.1	77.3	79.7	81.8	83.3	84.6	85.4
	Female	78.7	80.4	81.9	83.4	84.7	85.8	86.7	87.4

(b) Recovery Scenario

		1995	2000	2005	2010	2015	2020	2025	2030
Birth Rate	Per Thousand	13.5	14.5	14.8	16.5	14.9	12.6	11.3	11.4
Death Rate	Per Thousand	9.0	8.7	6.7	5.7	5.8	5.9	6.1	6.6
Net Emigration	Thousand	1.9	-26.0	-55.1	27.5	15.0	0.0	-5.0	-5.0

(c) Delayed Adjustment Scenario

		1995	2000	2005	2010	2015	2020	2025	2030
Birth Rate	Per Thousand	13.5	14.5	14.8	16.5	14.9	12.9	11.5	11.4
Death Rate	Per Thousand	9.0	8.7	6.7	5.7	5.8	5.8	6.1	6.6
Net Emigration	Thousand	1.9	-26.0	-55.1	27.5	19.0	2.0	-12.0	-9.0

(d) Stagnation Scenario

		1995	2000	2005	2010	2015	2020	2025	2030
Birth Rate	Per Thousand	13.5	14.5	14.8	16.5	14.9	12.4	10.3	9.6
Death Rate	Per Thousand	9.0	8.7	6.7	5.7	5.8	5.9	6.4	7.1
Net Emigration	Thousand	1.9	-26	-55.1	27.5	22	22	22	22

In the *Stagnation* scenario, the level of emigration assumed in the *Demographic Model* is much higher than in the case of the *Recovery* scenario. Because of the very unfavourable labour market circumstances in Ireland, emigration would be expected to run at 22,000 a year for the foreseeable future. This outflow would be quite large relative to the population and it would have a long-term impact on the size and composition of the population and the labour force. The level of emigration would be slightly higher under the *Delayed Adjustment* scenario than under the *Recovery* scenario whereas the other demographic assumptions would be broadly similar, as outlined in Table 4.5.

In the *Demographic Model* the rate of labour force participation is differentiated by gender, age and educational attainment. The model assumes that the proportion of the population completing third level education remains broadly unchanged in the future at the current historically high level. However, because the final educational attainment of the current cohort of the population in their late twenties is much higher than for older cohorts, there will be a continuing

increase in the average educational attainment of the total population of working age over the period to 2030.

The recent crisis has seen a fall in age and education specific labour force participation rates compared to the previous peak. For the future, in the *Recovery* and the *Delayed Adjustment* scenarios we make the rather conservative assumption that participation rates by gender, age and educational attainment will return to their previous peak by 2020.[21]. We also allow for some increase in the participation rate of the over 65s, reflecting the gradual increase in the retirement age. For the *Stagnation* scenario we make the assumption that, because of the unfavourable economic situation, participation rates by gender, age and educational attainment would remain unchanged at their 2012 level out to 2020. However, we allow for some increase in the participation rate of the over 65s, reflecting the gradual increase in the retirement age.

Tables 4.6 and 4.7 summarise the implications of these assumptions for participation rates for broad groups of the population over the period to 2030 for the *Recovery* and the *Stagnation* scenarios. (The assumptions for the *Delayed Adjustment* scenario are close to those for the *Recovery* scenario.) Primarily because of rising educational attainment, the *Recovery* scenario age specific participation rates are expected to rise over time. The rise in rates would be particularly marked for women as there is a much bigger difference in their education specific participation rates than is the case for men. While emigration and declining participation rates have resulted in a fall in the labour force in recent years, in the *Recovery* scenario the pattern would be reversed from 2015 onwards. The combination of the ending of emigration and the rise in participation rates would see an increase in the labour force of around 0.8 per cent a year for the following decade. By contrast, in the *Stagnation* scenario, the relatively high level of emigration would offset the effects of rising labour force participation after 2015. As a result there would be little change in the labour force over the forecast horizon under this scenario.

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[21]   Until the crisis labour force participation rates had been trending upwards.

TABLE 4.6 Recovery Scenario – Labour Force Participation Rates, Per Cent of Population

	1995	2000	2005	2010	2015	2020	2025	2030
Labour Force aged 15 to 19								
Males	22.3	25.0	21.6	11.2	10.3	10.4	10.3	10.7
Females	14.0	14.6	10.9	8.5	8.6	9.4	9.8	10.4
Total	18.3	19.9	16.4	9.9	9.5	9.9	10.1	10.6
Labour Force aged 20 to 24								
Males	77.9	75.4	73.8	66.1	63.9	64.0	65.4	65.3
Females	68.5	63.7	63.8	57.6	59.5	64.0	68.0	67.9
Total	73.3	69.6	68.8	61.8	61.7	64.0	66.7	66.6
Labour Force aged 25 to 44								
Males	95.0	95.8	94.2	93.3	92.9	93.6	94.2	94.2
Females	56.3	68.8	70.6	72.6	73.2	75.3	77.1	77.9
Total	75.5	82.2	82.5	82.9	82.8	84.3	85.6	86.1
Labour Force aged 45 to 64								
Males	81.2	81.7	81.9	81.6	81.4	82.2	83.5	83.4
Females	28.0	40.1	51.2	57.7	59.8	63.7	66.5	67.6
Total	54.8	61.1	66.7	69.6	70.6	72.9	75.0	75.4
Labour Force aged 65 and over								
Males	14.8	13.9	14.0	13.9	14.8	15.8	16.0	16.0
Females	1.9	3.0	3.2	4.6	5.3	6.3	6.5	6.5
Total	7.4	7.7	8.0	8.8	9.7	10.8	11.0	11.1

TABLE 4.7 Stagnation Scenario – Labour Force Participation Rates, Per Cent of Population

	1995	2000	2005	2010	2015	2020	2025	2030
Labour Force aged 15 to 19								
Males	22.3	25.0	21.6	11.2	10.2	10.3	10.1	10.6
Females	14.0	14.6	10.9	8.5	8.5	9.3	9.6	10.3
Total	18.3	19.9	16.4	9.9	9.4	9.8	9.9	10.4
Labour Force aged 20 to 24								
Males	77.9	75.4	73.8	66.1	63.9	64.0	65.3	65.2
Females	68.5	63.7	63.8	57.6	59.5	63.8	67.9	67.8
Total	73.3	69.6	68.8	61.8	61.8	63.9	66.5	66.5
Labour Force aged 25 to 44								
Males	95.0	95.8	94.2	93.3	92.9	93.7	94.2	94.1
Females	56.3	68.8	70.6	72.6	73.1	75.2	76.8	77.8
Total	75.5	82.2	82.5	82.9	82.8	84.2	85.4	86.0
Labour Force aged 45 to 64								
Males	81.2	81.7	81.9	81.6	81.4	82.2	83.4	83.2
Females	28.0	40.1	51.2	57.7	59.8	63.7	66.4	67.5
Total	54.8	61.1	66.7	69.6	70.6	72.9	74.9	75.3
Labour Force aged 65 and over								
Males	14.8	13.9	14.0	13.9	14.8	15.8	16.0	16.0
Females	1.9	3.0	3.2	4.6	5.3	6.3	6.5	6.5
Total	7.4	7.7	8.0	8.8	9.7	10.8	11.0	11.1

Rising educational attainment affects the economy through a number of channels. Men, and especially women with third level education, have a much

higher participation rate than those who have only a Leaving Certificate or lower level of education. Thus, the rising educational attainment of the population will lead to an increase in labour force participation. This is an important factor in driving growth in potential output in the coming decade (Bergin and Kearney, 2007). Rising educational attainment also enhances the productivity of the labour force. Figure 4.3 shows the average growth in an index of the human capital of the labour force.[22] This indicates that the effects of rising educational attainment on productivity are likely to be lower in the future than in the past, though still significantly positive, enhancing the rate of growth in potential output (Durkan, FitzGerald and Harmon, 1999). This effect of rising human capital on productivity would be slightly weaker in the *Stagnation* scenario because of the higher level of emigration.

FIGURE 4.3   Recovery Scenario – Human Capital Index, Average Annual Growth, per cent

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[22]   The labour force is weighted by the private returns to individuals, classified by four levels of education, to produce the human capital index. Under certain restrictive assumptions, the growth in this index will reflect the growth in the productivity of the labour force.

Chapter 5

Medium-Term Scenarios

5.1   Introduction

In this chapter we discuss the details of the three scenarios for the Irish economy. In developing the scenarios we first discuss their implications for different sectors of the economy: the implications for domestic output and demand, for the housing market and the labour market and, finally, for the public finances. We discuss the *Recovery* scenario at somewhat greater length than the other two scenarios as it gives us an opportunity to explain key mechanisms in the economy that determine the future growth path. The same mechanisms (as embodied in the *HERMES* model) that explain the details of the *Recovery* scenario also apply to the other two scenarios. While we have prepared the scenarios on the basis of the fiscal policy assumptions set out in Chapter 4, at the end of this chapter we discuss the possible implications of varying some of these fiscal assumptions.

5.2   Recovery Scenario

This scenario examines the potential recovery in the Irish economy if Europe and the rest of the global economy return to a more normal growth pattern in the next two years and if domestic policy is supportive of such a recovery.

Figure 5.1 shows five year average growth rates for GNP from 1990. After a period of very low growth between 2010 and 2015 this scenario envisages a period of significantly higher growth beginning in 2015 and continuing to 2020. Over the five years to 2020 growth would average around 3.5 per cent a year under this scenario and the economy would recover some of the ground lost over the crisis period. However, this period of higher growth would be expected to be of limited duration, with the economy reaching its level of potential output around 2020. While we concentrate in the rest of this chapter on the period to 2020, the model simulation suggests that after 2020 growth would slow to rates closer to potential, averaging a little over 2 per cent a year.

FIGURE 5.1   GNP, Average Annual Change, %
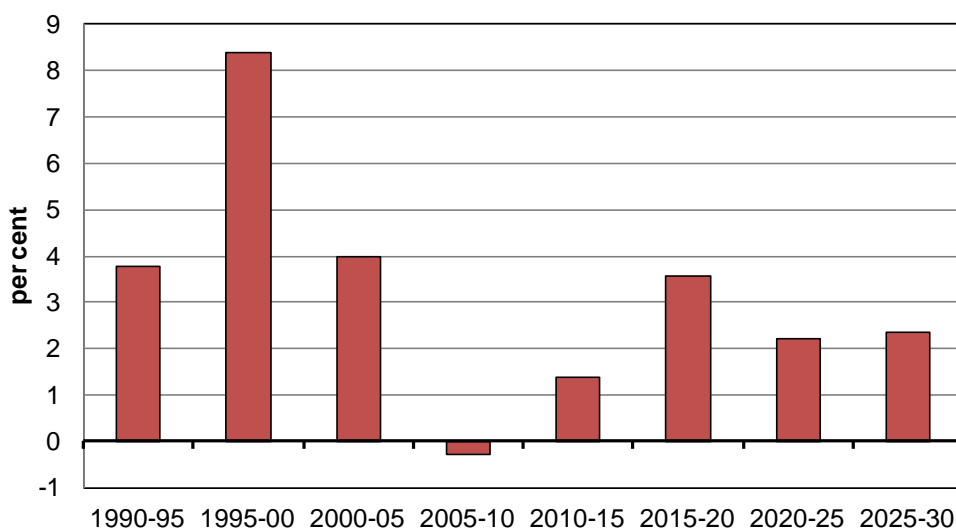
The recovery in the European and global economy would first boost demand for the output of the Irish tradable sector. Output in industry and market services would grow strongly in 2015 (Table 5.1) with the pace of expansion moderating thereafter. Exports of goods and services would respond to the improvement in external demand, although services exports would expand at a substantially stronger pace than merchandise exports.

In the case of domestic demand, the scenario envisages a recovery in building and construction from 2015 onwards, driven by both housing and other investment. Consumption would recover at a more gradual pace – it is likely to lag developments in the tradable sector of the economy. The recovery in the domestic economy would be facilitated by the ending of the substantial negative drag from fiscal policy. With a less contractionary fiscal stance from 2015 onwards (and a neutral fiscal policy stance from 2018 onwards) real personal disposable income would begin to rise.

TABLE 5.1   Recovery Scenario, Major Aggregates[23]

	% Change								
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
GDP	0.9	1.7	3.0	4.0	4.1	4.2	3.7	3.7	4.0
GNP	3.3	1.2	0.5	4.3	3.6	4.0	3.4	3.2	3.6
Consumption	-0.9	-0.2	-0.3	2.1	1.7	3.3	3.4	2.6	3.2
Investment	-2.3	0.2	7.8	16.0	23.3	17.6	2.5	3.0	4.1
Employment	-0.6	0.5	0.9	2.3	2.9	1.9	2.2	2.1	2.1
Output, Industry	0.3	1.4	6.1	7.0	6.5	5.7	4.7	5.1	5.3
Output, Market Services	3.9	0.6	3.1	4.1	4.3	4.5	3.8	3.6	3.9
Productivity, Manufacturing	3.9	2.4	5.5	7.2	5.2	5.1	6.9	6.7	6.4
Productivity, Market Services	4.1	0.1	1.2	0.6	2.0	3.2	-0.1	0.2	0.8
Prices, Consumption	1.8	1.4	1.9	2.2	2.4	2.4	2.2	2.2	2.2
Prices, Housing	-2.0	2.0	0.7	6.4	2.7	3.0	1.6	1.0	2.5
Non-Agricultural Wage Rates	1.4	0.8	0.9	2.0	3.7	4.3	3.8	3.6	3.7
	% of GDP								
General Govt. Deficit (inc. banks)	7.6	7.3	5.0	3.2	1.2	0.4	-0.3	-0.7	-1.0
General Govt. Deficit (excl. banks)	7.6	7.3	5.0	3.2	1.2	0.4	-0.3	-0.7	-1.0
	% of GNP								
General Government Debt, Net,	122.1	128.1	131.4	127.3	121.4	113.8	107.0	100.4	93.3
Current Account (adjusted)	-0.1	0.4	1.0	2.1	1.1	0.1	0.8	1.6	2.1
Unemployment Rate, % of Labour Force	14.5	14.0	13.4	11.8	10.6	9.5	8.2	6.9	5.6
Net Emigration, 000s	34	35	20	15	0	0	0	0	0
Housing Completions (000)	8488	10000	10000	12000	24323	25668	24474	22474	20608
Personal Savings Ratio	4.1	4.9	3.0	3.9	4.5	5.5	5.9	4.9	4.5
Investment/GNP ratio	12.2	12.2	13.1	14.8	17.8	20.3	20.1	20.1	20.2

Average Annual % Change									
From	**85-90**	**90-95**	**95-00**	**00-05**	**05-10**	**10-15**	**15-20**	**20-25**	**25-30**
GDP	3.3	4.0	9.2	4.8	0.1	2.2	4.0	2.2	2.0
GNP	2.8	3.8	8.4	4.0	-0.3	1.4	3.6	2.2	2.3
Consumption	3.0	3.0	8.3	4.5	0.8	-0.4	2.8	2.7	2.9
Investment	4.4	3.0	12.7	6.7	-12.0	1.5	9.8	2.2	3.8
Employment	1.0	1.9	4.9	3.2	-0.7	0.2	2.2	0.8	1.0
Output, Industry	6.7	7.6	11.9	5.0	1.4	3.3	5.4	3.2	1.5
Output, Market Services	3.5	3.1	9.2	4.1	-0.1	2.7	4.0	1.3	2.0
Productivity, Manufacturing	7.3	7.1	8.6	6.3	8.2	4.9	6.1	4.0	1.8
Productivity, Market Services	1.8	0.0	2.7	0.4	-0.6	1.7	1.2	0.7	1.2
Prices, Consumption	3.5	2.9	3.4	3.5	0.3	1.8	2.3	2.2	2.3
Non-Agricultural Wage Rates	5.1	4.4	5.9	5.8	1.5	1.2	3.8	3.8	3.0
Average Annual									
General Gov. Def. (inc. bank) % of GDP	3.7	2.5	-2.2	-0.8	9.9	7.1	-0.1	-0.9	-0.6
Current Account (adjusted), % of GNP	-1.6	1.8	1.3	-0.6	-5.1	-0.1	1.1	1.5	2.6
Unemployment Rate, % of Labour Force		14.8	8.1	4.4	8.1	13.6	8.2	5.4	4.7
Housing Completions (000)	22.0	24.2	42.2	67.4	52.8	10.2	23.5	24.8	25.8
Investment/GNP ratio	18.8	18.4	24.5	27.9	23.9	13.0	19.7	20.5	20.8

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[23]   The adjustment to the current account for redomiciled plcs. is described in FitzGerald (2013). Also, as discussed in Chapter 3, the data differ slightly from the latest published CSO data.

In terms of annual growth rates, the scenario incorporates a significant recovery in output from 2014 onwards, which is reinforced from 2015 onwards by the substantial growth in domestic demand (Table 5.1 and Figure 5.2). Even under this benign scenario, such a recovery would take some time to restore the level of GNP to where it was at its peak in 2007. In this scenario it would be 2017 before the level of GNP exceeded the level in 2007 (Figure 5.3). In this case, the effect of the crisis would prove to be a lost decade of growth. However, in the *Stagnation* scenario, discussed later in this chapter, it would be at least the middle of the next decade before the previous peak of output would be achieved.

FIGURE 5.2   GNP, % Change
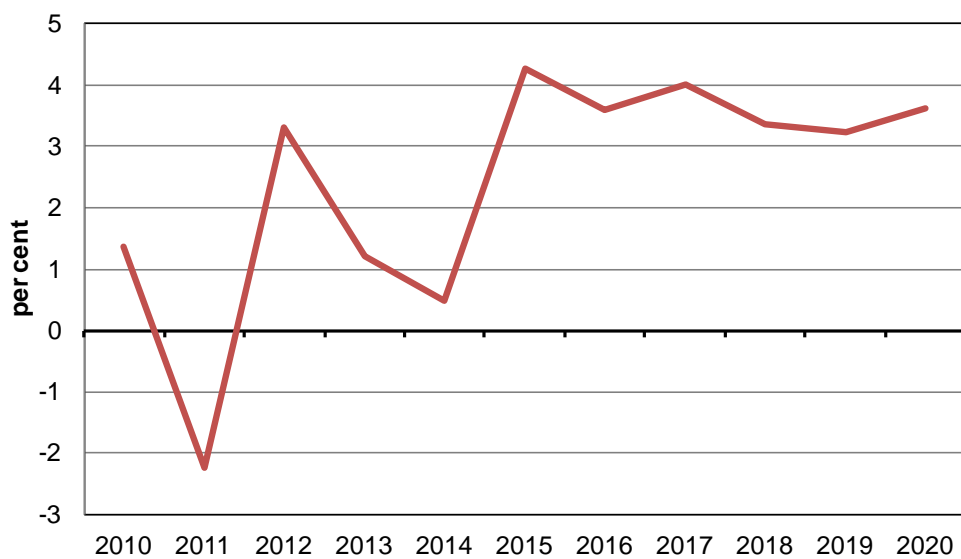
FIGURE 5.3   Path of GNP under Different Scenarios, € Million, Constant Prices
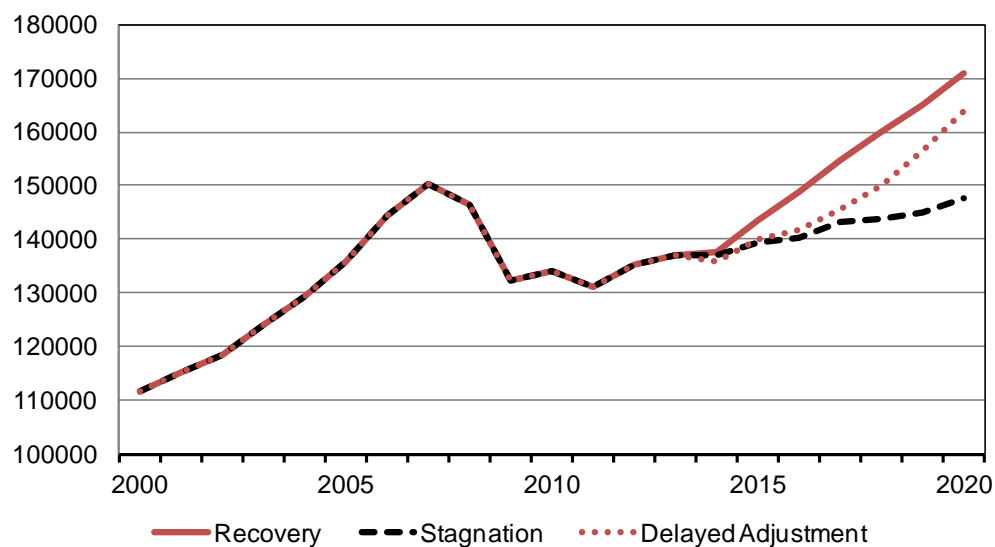
Output

The *HERMES* model reflects how the tradable sector of the Irish economy has operated in recent decades. We characterise the sector in the following way. Firms in the tradable sector first choose the level of output in Ireland that will minimise their cost of production world-wide and maximise the profitability of their operations in Ireland.[24] In choosing the level of output they also choose the cost minimising input of labour, capital and of materials and services (the majority of the inputs are imported) in Ireland. As most of the output of the tradable sector is destined to be exported, the level of output in the sector in any year determines the level of exports. The substantial improvement in Ireland's competitive position over the last five years should result in an increase in the Irish tradable sector's share in key markets, once those markets return to growth.

Thus a recovery in foreign demand, especially in demand from the EU, would have a major impact on the Irish tradable sector. The tradable sector has grown in scope over the last two decades; it covers manufacturing, and business and financial services.[25] The transport and communications sector is also now exporting a significant part of the services that it produces.

Because Ireland has specialised into producing goods and services with a high international income elasticity of demand (e.g., high-tech goods), the tradable sector will grow more rapidly than EU and US GDP. However, what is important is the growth in value added in Ireland. Because of the sophisticated nature of the production process, the high tech. sector involves major imports of materials and services. Over time imported inputs of goods and services are accounting for a rising share of gross output so that the final impact on the economy of quite rapid growth in gross output is less than might be expected (The ultimate impact on the economy of increasing tradable sector output is analysed in more detail in the next chapter.) Thus, the growth in value added tends to lag the growth in gross output and exports.

As shown in Table 5.1 Industrial output is expected to show significant growth from 2014 onwards.[26] Manufacturing is anticipated to grow fairly steadily over the decade. In this scenario building and construction would return to growth in 2014. Furthermore, with a recovery in investment in 2015 and 2016, it would be anticipated that the growth in the building and construction sector would accelerate. Nonetheless, even after a recovery in the middle years of the decade,

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[24] This is consistent with a world of small firms where either they succeed in producing a share of world output in Ireland or that production is produced by other firms operating in other competing locations.

[25] As discussed earlier, under the NACE Rev 1 definitions used in this *Review* the IT services and software sector is still largely included in manufacturing. Under the revised NACE Rev 2 it is included in the distribution sector.

[26] The industrial sector comprises manufacturing, building and construction and utilities.

the building sector would still be only a shadow of what it was at the height of the boom. This is to be expected, given the excessive size of the sector that resulted from the property boom.

Productivity growth in manufacturing is expected to remain quite rapid out to 2020. However, as the sector matures in the next decade it is to be expected that the rate of growth in productivity would slow. Productivity growth in services is expected to be a little higher than in the past, reflecting its growing globalisation. Measured as GDP per person employed, the growth in productivity for the economy from 2015 onwards would be in line with the average rate over the period 1990-2010.

Domestic Demand

Recovery in domestic demand would be likely to lag the recovery in tradable sector output. In particular, households have been seriously scarred by the experience of the last five years (Gerlach-Kristen, 2013b). A minority of households are facing major difficulties with the overhang of debt and other households are uncertain about their future employment status or income. The impact of the crisis was to produce a significant rise in the savings rate (Figure 5.4). The consumption function in *HERMES* sees consumers responding to changes in their permanent income. As a result changes in both their net financial assets position and the value of their housing wealth affect consumption. The effect of the dramatic fall in the value of housing wealth has been that households have tended to deleverage, increasing their savings and improving their net financial asset position. The implications of this process for the economy are explored further in Chapter 6.

FIGURE 5.4   Savings Ratio, %
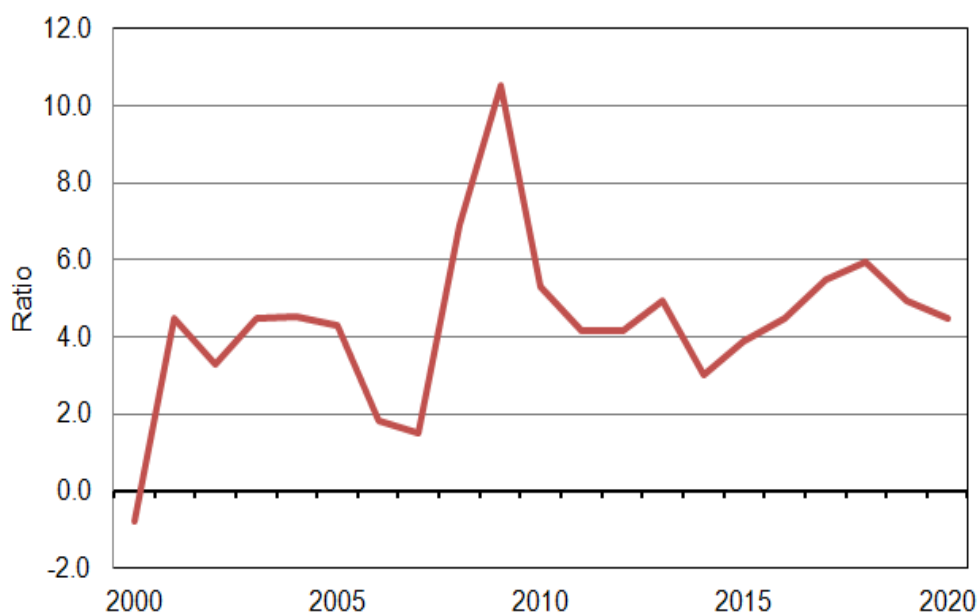
In this scenario employment begins to recover in 2014 with quite strong growth in 2015 and 2016. When combined with a return to growth in real wage rates from 2016 onwards, these favourable developments would result in significant growth in consumption in 2015, which would accelerate from 2017 onwards. However, even in 2020 consumption per head would still be well below its 2007 peak (Figure 5.5).

FIGURE 5.5   Real Consumption Per Head, €
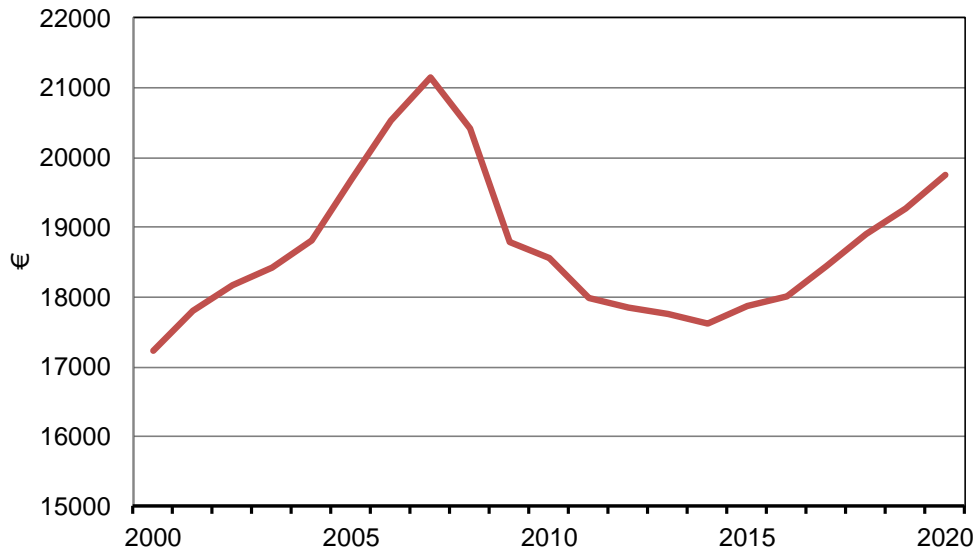
A factor affecting consumption behaviour is the growing size of the cohort of people in their late twenties, and also now their early thirties, who did not buy property at the peak of the boom or in the period since. Today, where they have stable employment they are not suffering from over-indebtedness. Instead their consumption behaviour is constrained by uncertainty about the future. If the economy follows the path set out in the *Recovery* scenario, this uncertainty would diminish over time, with consequences in terms of the future consumption and investment behaviour of this cohort.

The demographic changes that are under way will have important implications for the housing market over the coming decade. The rise in life expectancy will reduce the number of dwellings that become vacant each year through deaths. The pattern of migration has exerted a major influence on domestic demand for housing in recent years – adding to demand in the last decade and reducing demand in the most recent period. If net migration ends later in the decade, as anticipated under the *Recovery* scenario, it will mean that the natural increase in the population would again require the provision of additional dwellings.

Obviously demographic factors are only one element driving demand for dwellings in Ireland. Other economic factors play a crucial role, especially in the short term. In the 1990s and the last decade the high and rising cost of accommodation tended to discourage people from setting up independent households. They shared accommodation or lived at home with their parents to an older age than in many other countries to avoid the costs of establishing an independent household. This effect from the rising cost of accommodation was partially offset by the effects of rising real incomes. As discussed later, in the forecast period the availability of finance is likely to be an important new factor affecting real demand for new dwellings. It was not an issue in the last two decades.

Table 5.2 shows the decomposition of the sources of housing demand in the past and the Demographic model's estimates for the period to 2030. In the *Recovery* scenario we are assuming no change in headship rates[27] over the full period to 2030. (There was little change in headship rates between 1996 and 2006, probably reflecting rising costs. There was a small fall in headship rates between 2006 and 2011 – maybe lower rents more than offset the effect of lower incomes). Currently headship rates in Ireland appear to be similar to the US.[28] This might suggest little change in headship rates in the forecast period. However, rates also seem to be well below British rates today, which would argue for an increase in Ireland in the future. In the absence of more detailed research, in this *Review* we assume unchanging headship rates in the forecast period.

TABLE 5.2   Recovery Scenario – Decomposition of Housing Demand, average per year, (000)

	1991-1996	1997-2002	2003-2006	2007-2011	2012-2016	2017-2021	2022-2026	2027-2031
Natural Increase	16.5	20.0	27.9	31.6	18.7	20.2	19.5	20.2
Migration	0.0	5.9	17.5	5.4	-4.7	-1.0	1.0	1.9
Change in Headship	3.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Vacant	2.4	9.6	21.3	9.6	-6.0	-0.3	-0.7	-1.3
Obsolescence	4.9	11.6	13.4	7.0	5.0	5.0	5.0	5.0
Dwellings Built	27.0	48.0	80.0	53.5	13.0	23.9	24.8	25.7

Table 5.2 shows that migration has limited effects on household numbers in the period after 2016 because of the assumption of limited net migration into and out of Ireland. Most of the change in household numbers is likely to be driven by the natural increase in the population. Over the coming fifteen years the natural increase in the population will result in the formation of around 20,000 new

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[27]   Headship rates are the proportion of each age cohort of the population that are heading up independent households.

[28]   Masnick, G., D. McCue, and E. Belsky (2010), "Updated 2010-2020 Household and New Home Demand Projections", Joint Center for Housing Studies, Harvard University, Working Paper W10-9.

households each year requiring a separate dwelling. In addition to this source of demand each year, a certain number of dwellings disappear each year either through redevelopment or through dilapidation.[29]

In the period to 2016 it is assumed that each year 6,000 vacant dwellings are occupied by new households obviating the need for additional building. However, there are signs in the Dublin area that the stock of vacant dwellings has been largely exhausted.[30] The remaining vacant dwellings in Ireland may not be in locations where new households are being formed so that in the period after 2015 there will be significant demographic pressures for new dwellings to be built in suitable locations.

Housing investment has fallen to an exceptionally low level over the course of the crisis. However, population growth has continued and, as discussed above, in recent years the growth in the number of households has been accommodated through a reduction in the stock of vacant dwellings, especially in the major urban areas. Over the rest of the decade the diminishing stock of vacant dwellings in high demand areas will mean that either headship rates will have to fall rapidly or else more houses will have to be built, as is assumed in this scenario. Housing completions are estimated to remain at around 10 to 12 thousand to 2015. However, the *HERMES* model suggests that, if adequate credit were available, completions could more than double from 2016 onwards to between 20,000 and 25,000 a year. Such a level of investment would be necessary in the next decade if the ongoing demographic change in Ireland is to be accommodated. In Section 3.3, in the *Delayed Adjustment* scenario we consider the implications for the housing market of a failure to reform the banking system so that it can finance such future growth in investment.

Table 5.1 and Figure 5.6 show the investment to GNP ratio for Ireland. In developed EU economies this ratio tends to lie around 20 per cent.[31] This was also the ratio under more normal conditions in Ireland before the boom began. In 2012 this ratio was just over 12 per cent – an historically very low level. In this scenario growth in the volume of investment would gradually return the investment to GNP ratio to around 20 per cent by 2017. This growth in investment would be driven by the profitability of enterprises across the private sector. To accommodate their increasing output, and also to replace decaying assets, firms would have to raise significantly their level of investment.

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[29] For example a dwelling that is let as a number of units may be converted for single household occupancy.

[30] Duffy, D. and J. FitzGerald (2012), "The Irish Housing Market", *Quarterly Economic Commentary*, Summer 2012, pp. 63-76

[31] For other countries it is best expressed a s a percentage of GDP.

FIGURE 5.6   Investment to GNP Ratio, % of GNP
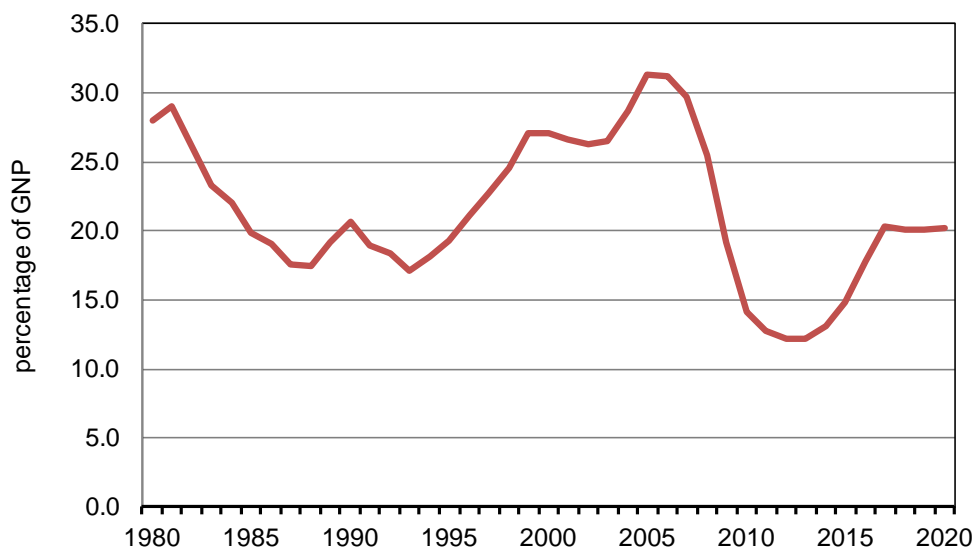
The current level of investment would not sustain significant future growth in the economy. Figure 5.7 shows an index of the ratio of the actual capital stock in the manufacturing sector to the optimal or long run capital stock, as determined in the *HERMES* model. The optimal level of the capital stock is derived in *HERMES* on the assumption that, given time, firms in Ireland choose the capital stock that will allow them to produce their desired level of output in Ireland at minimum cost. Enterprises then adjust their actual capital stock to the long run level through an appropriate level of investment. Figure 5.7 shows that the ratio of actual to optimal capital stock is very low today by historical standards. This would suggest that enterprises in the manufacturing sector will find it profitable to undertake significant investment in the coming years. The precise timing of this investment will be affected by expectations concerning the short-term growth in foreign demand. Thus investment in the tradable sector of the economy is likely to show a significant increase if a recovery in the EU economy becomes well established. This explains the forecast in Table 5.1 of rapid growth in investment in 2015-17, restoring investment to a level that would allow for the likely growth in potential output.

FIGURE 5.7 Ratio of Capital Stock to Optimal Capital Stock, Manufacturing, 2000=1.0
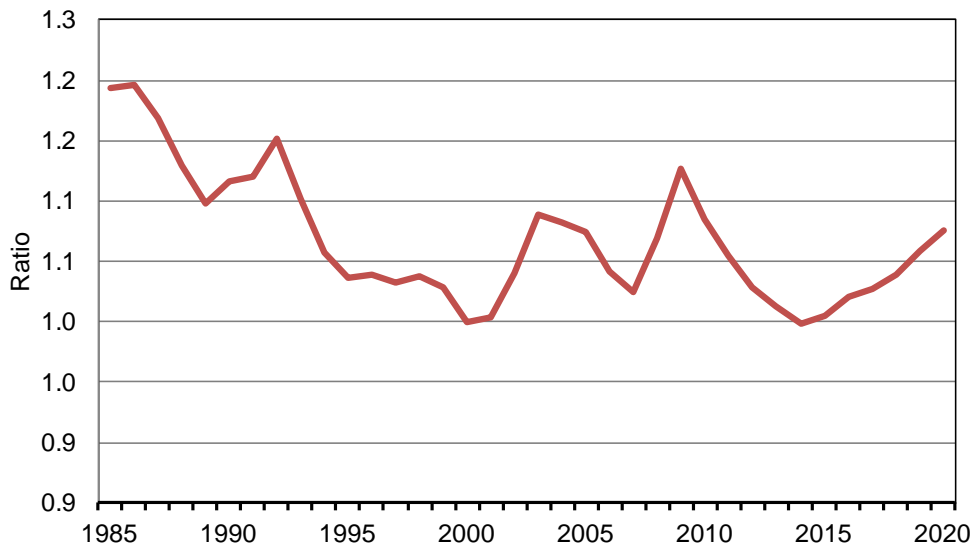
Current Account

As discussed in FitzGerald (2013), the current account balance for the years 2009-2012 has been significantly affected by the retained profits of redomiciled PLCs. Figure 5.8 shows the path of the current account over the last 30 years, with an adjustment to remove these exceptional payments for the years 2009-12. 2012 saw the Irish economy move back into surplus on the current account. This means that, while the government sector borrowed around 7.6 per cent of GDP in 2012, the private sector reduced its level of net foreign indebtedness by a slightly greater amount.

FIGURE 5.8 Current Account Balance, Adjusted, % of GNP
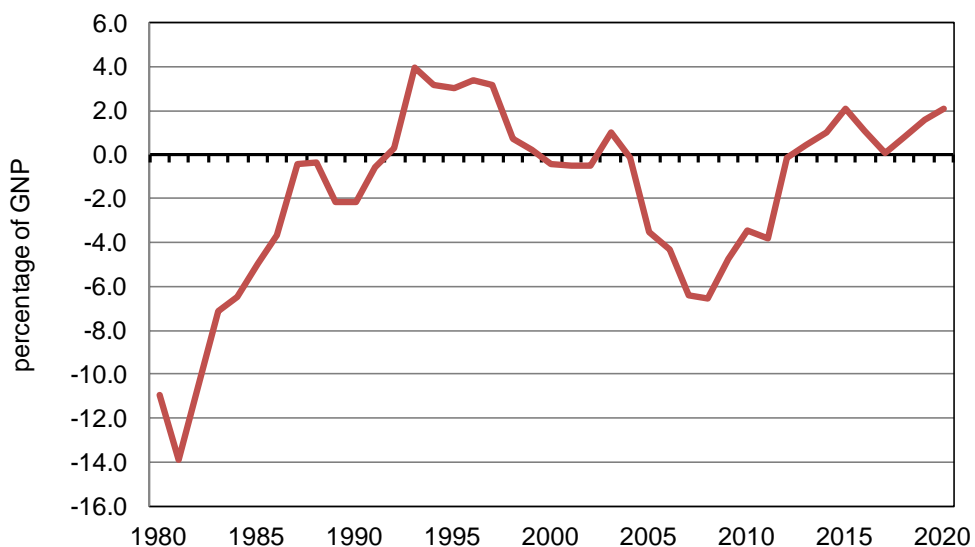
As a result of the strong growth in exports from 2014 onwards, partially offset by the modest growth in consumption and imports, this scenario envisages the current account showing a surplus of under 2 per cent of GNP over the rest of the decade (after adjustment for redomiciled PLCs.). The effect of the increased exports of the tradable sector would be roughly offset by the effects of a rise in domestic demand on imports. This pattern would be fully sustainable in the long term.

Labour Market

While the last five years have been an exceptionally bad period for the labour market, some progress has been made in repositioning the Irish economy. There has been a substantial improvement in competitiveness relative to key competitors.[32] The *HERMES* model suggests that the long-term own price elasticity of demand for labour is around -0.4. This means that a 1 per cent fall in labour costs relative to competitors results in a 0.4 per cent rise in employment. However, even more important than the improvement in competitiveness (including all the other domestic costs other than labour) is the return to growth in the EU and in Ireland envisaged under this *Recovery* scenario.

Once domestic demand begins to recover, especially from 2015 onwards, it is likely that the rate of increase in numbers employed would accelerate (Table 5.1). The recovery in investment from 2015 would be likely to be quite employment intensive as it would see a significant increase in the demand for building and construction. Also, the anticipated recovery in housing output from 2016 onwards would be important, once again calling for increased output and employment in building and construction.

The recovery in domestic demand generally, and in consumption in particular, would be important for employment growth. It would impact on employment in the market services sector. When taken together these changes under the *Recovery* scenario would mean that employment would grow by between 2 per cent and 3 per cent in 2015 and 2016 with an increase of around 2 per cent a year thereafter until 2020.

The implied growth in productivity for the economy (GDP/employment) is 1.5 per cent a year in the period 2015-20. Productivity growth in the manufacturing sector is estimated to grow by 6 per cent a year between 2015 and 2020, broadly the same as in the 2000-05 period (Table 5.1). Productivity growth in market

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[32] Competitiveness has improved on a number of fronts: in Ireland labour costs, property prices and domestic input prices have either remained unchanged in nominal terms or fallen (property prices), while they have risen in many of Ireland's competitors.

services is traditionally much lower, partly because of measurement issues. In the period to 2020 it is expected to grow at around 1.2 per cent a year. This would be within the range experienced over the last three decades.

As discussed above, based on the results from the latest version of the ESRI Demographic model, there is likely to be a significant increase in the size of the labour force in the forecast period. Having fallen over the year 2010-15, it is forecast to grow by around 0.8 per cent a year between 2015 and 2020. This rise is attributable to the likely ending of net emigration once an economic recovery becomes established, and also to a rise in labour force participation, especially by women.

Unemployment is currently at an exceptionally high level and, as discussed earlier, underemployment is also high. Even with some limited growth in the economy this year and next, there is only likely to be a small reduction in the unemployment rate by the end of 2014. The unemployment rate would have gone even higher in the current period were it not for the substantial emigration that has taken place and also due to the reduction in the labour force participation rate that has been observed over the last few years. The limited progress in reducing the unemployment rate this year and next year reflects the fact that the growth in output in the tradable sector is not very employment intensive and that there is considerable slack in the economy.

However, as discussed above, in the *Recovery* scenario employment is expected to grow relatively rapidly between 2015 and 2020 (Table 5.1). This growth would be sufficient to bring about a substantial reduction in the unemployment rate over the period 2015-20. By 2020 the unemployment rate on an ILO basis could be down to between 5 and 6 per cent of the labour force (Figure 5.9). While still above the full-employment level of the last decade, if achieved, it would represent a major improvement on the current situation. The nature of the employment growth would also be favourable. With a substantial increase in employment in the building and construction sector and in the distribution and other market services sector there would be a reasonable prospect that those currently unemployed would find suitable employment. However, to facilitate this process it will be important that appropriate labour market policies are followed (Kelly, McGuinness and O'Connell, 2011). If this were to happen it would have a significant distributional effect, reducing the proportion of the population most likely to face poverty, namely the unemployed (Watson, Maître and Whelan, 2012).

FIGURE 5.9   Unemployment Rate, ILO
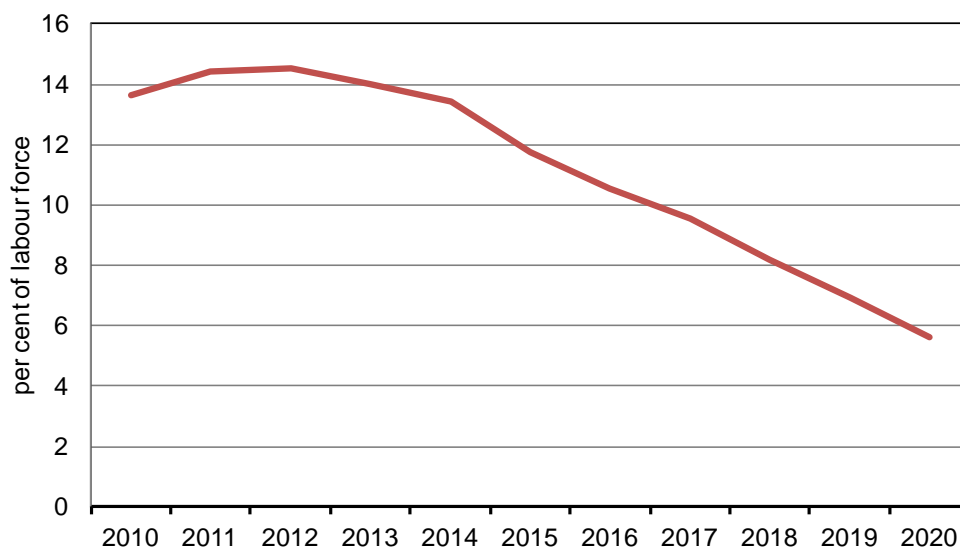
There are serious concerns that the high level of long-term unemployment could result in hysteresis in the labour market. The long-term unemployed may lose skills or expertise, which could make them less employable in an economic recovery. In this scenario we assume that this problem is not too acute, given the relatively high level of education of many of the unemployed. However, in the *Delayed Adjustment* scenario we examine the case where unemployment proves more enduring.

In *HERMES* wage rates in the long run are assumed to adjust to clear the labour market, returning the economy to full employment. However, the adjustment process can take many years. It is particularly problematic when that adjustment involves a fall in nominal wages. As we have seen over the last five years, even in the extreme labour market conditions that we have experienced, private sector wage rates did not fall (Walsh, 2011, and Bergin, Kelly and McGuinness, 2012). In the *HERMES* model the long-run equilibrium wage is a function of the intersection of the demand curve for labour (with an elasticity of -0.4) and the supply curve of labour (assumed to have an elasticity of 1.0).

Figure 5.10 shows the ratio of the actual wage rate (average non-agricultural earnings) to the long run or equilibrium wage rate. This Figure suggests that wage rates were below their long-run equilibrium in the late 1990s – the economy was super-competitive (Blanchard, 2001). By around 2003 actual wage rates were broadly in line with their long-run market clearing value. However, after 2003 wage rates, driven by the excess demand in the economy, grew very rapidly so that by 2008 they were far above their optimal or long-run value. Since then

there has been a gradual restoration of competitiveness, as wage rates rose very slowly in Ireland while they rose more rapidly in competitor economies.

FIGURE 5.10   Ratio of Actual to Long-Run Non-Agricultural Wage Rates
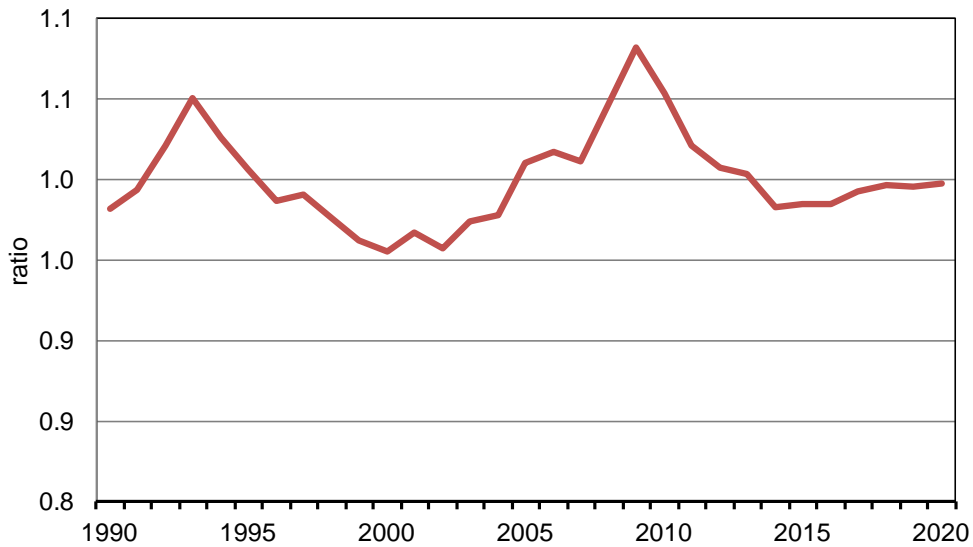
The very limited increase in wage rates in the private sector happened in spite of the big increase in the tax wedge affecting employees. Thus real after tax wages have fallen considerably in recent years. Under normal circumstances, a significant part of the rise in the tax wedge would have been passed on as higher wage rates. However, because wage rates were so far above the equilibrium value in 2008, the full effect of the rising burden of taxation was carried by employees. This also meant that the negative short-term multiplier effects of the tax increases were greater than they would have been under more "normal" economic conditions.

Figure 5.10 suggests that wage rates will have returned to their long-run market clearing rate by the middle of the decade. As a result, we anticipate that private sector wage rates will rise significantly between 2015 and 2020 averaging growth of around 3.8 per cent a year. This rate of increase would roughly compensate labour for expected inflation and the expected growth in productivity. As a result, labour's share of value added (Figure 5.11), which rose rapidly during the crisis, would stabilise at around the level it was in 2003 (Sweeney, 2013).

FIGURE 5.11   Labour Share of Value Added excluding agriculture
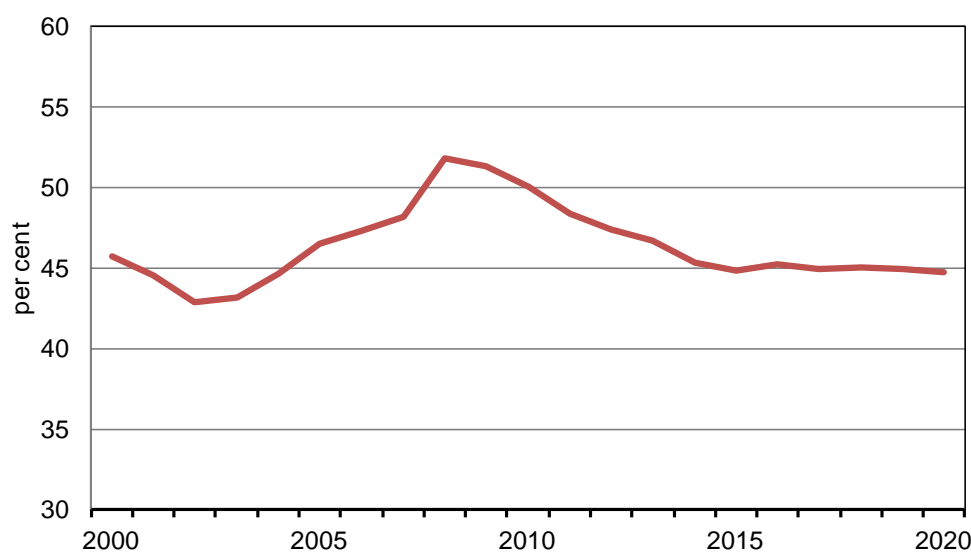
Public Finances

The assumptions underlying the public finances have been set out above. These involve an ending of major cuts and tax increases after the 2014 Budget, followed by three years of continued moderate fiscal tightening through under-indexation. Thereafter a broadly "neutral" fiscal stance is assumed. As a result of these assumptions, and the return to growth in the economy envisaged in this *Recovery* scenario, the general government deficit would be almost eliminated by 2017. Even with a fully neutral fiscal stance over the period 2015-20 there would be a small general government surplus in 2018-20. This would suggest that the bulk, if not all, of the general government deficit of 5 per cent of GDP forecast for 2014 is cyclical in nature; without further fiscal action it would disappear after a period of normal growth.

As well as ensuring that the public finances are restored to a sustainable path within the forecast horizon, the fiscal assumptions also ensure that government expenditure stabilises at around 40 per cent of GNP in the medium term. As can be seen from Figure 5.12, government revenue has oscillated within quite a narrow band around 40 per cent of GNP since the early 1980s. It is government expenditure which has shown more volatility. As a result of the crisis, and especially because of the need to fund the banks, public expenditure as a share of GNP reached an exceptional level at the height of the crisis.

FIGURE 5.12   Government Expenditure and Revenue (excluding expenditure on banks), % of GNP
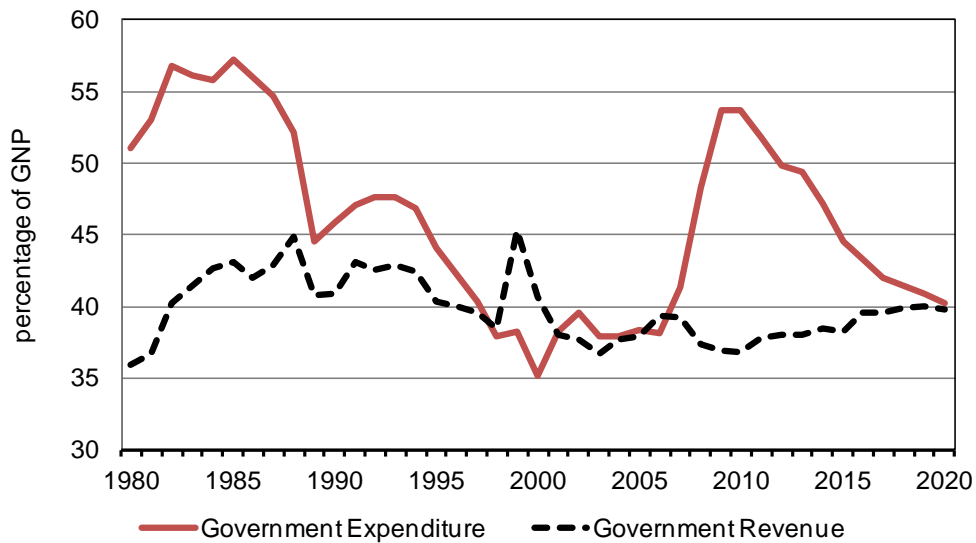
This level of public expenditure (or its composition) is not intended to be normative: it is open to policymakers to choose a higher or lower level of taxation and, hence expenditure, depending on their preferences. Experience over more than 30 years suggests that such a level of revenue of 40 per cent of GNP (and hence of expenditure) can be readily supported by the economy. However, because of the enhanced level of debt interest payments, the public goods and services that can be purchased with that level of expenditure would be lower than in the early years of the last decade. This is one of the costs of a high level of indebtedness.

Government Debt and Financial Assets

Figure 5.13 shows the General Government Debt, net of liquid financial assets,[33] as a percentage of GNP. This is probably the best measure of the burden of the debt on the economy. At the moment, to ensure a smooth re-entry to the financial markets the government is holding an exceptional level of cash which boosts the gross debt. This reassures the markets that the government will not face a major financing hurdle in the foreseeable future. Ignoring this factor seriously exaggerates the debt burden. However, the burden is probably under-estimated if it is expressed as a share of GDP. In Figure 5.13 we show the net debt expressed as a percentage of both GDP and GNP.

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[33]   Holdings of cash and the assets of the National Pension Reserve Fund valued at €5.4 billion.

FIGURE 5.13 General Government Debt, Net, Ratio to GNP and GDP
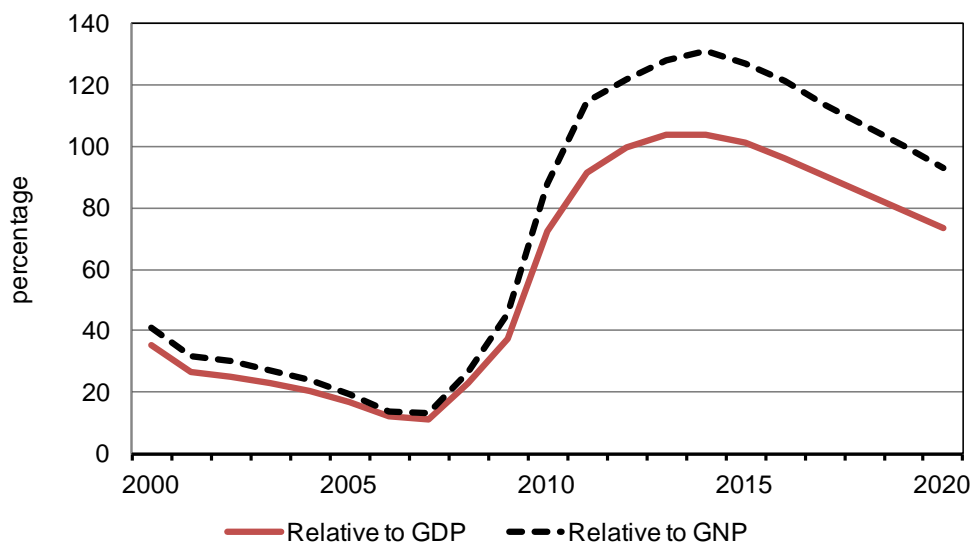
As shown in Figure 5.13, as a share of GNP the debt will peak next year at around 131 per cent. As a share of GDP it will peak this year and next at around 104 per cent. However, with a return to significant growth from 2014 onwards and with the structural deficit being largely eliminated by the end of 2014, the net debt to GNP ratio would fall quite rapidly. By 2020 the ratio would be down to 93 per cent of GNP or 74 per cent of GDP.

Under the *Recovery* scenario, the return to growth in the economy could be expected to have a number of other consequences. As shown in Figure 5.14 the *HERMES* model would suggest that the risk premium on Irish government debt would fall substantially by 2020 (see Box B in Chapter 3 for a discussion of the modelling of the risk premium). While the assumed external environment would see German bond rates recovering to close to 4 per cent by 2020, Irish bond rates would be only 0.8 percentage points higher. This would represent a dramatic reduction in the risk premium. In *HERMES* this reduction is driven by a combination of a steady fall in the debt level and the establishment of a small general government surplus.

A further consequence of a return by the Irish economy to a period of significant growth would be a change in the value and marketability of other state assets. Here we consider just three types of asset: the banks, the Central Bank's holdings of Irish government debt and the establishment of Irish Water. There are other assets which may also be realised over the coming decade, which could also affect the debt level.

FIGURE 5.14   Government 10 year bond rates
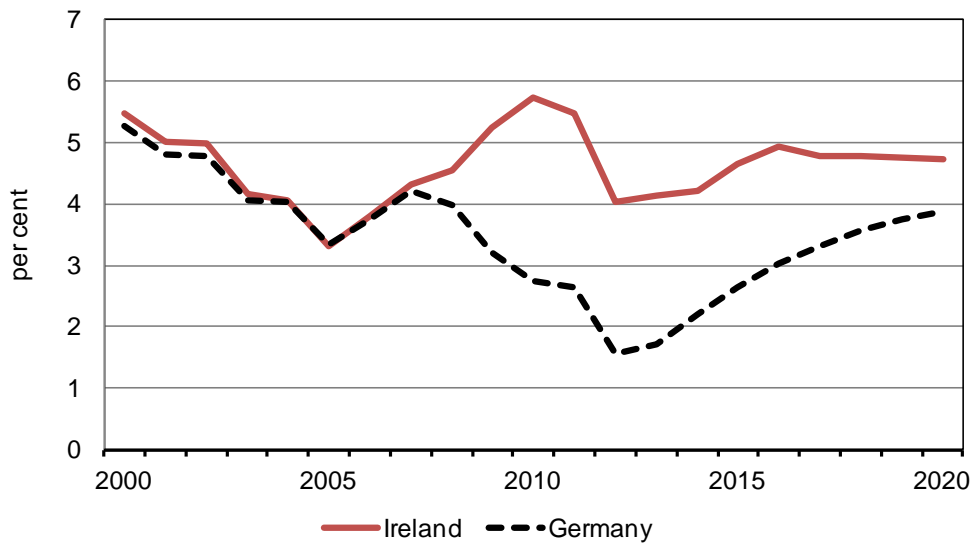
The recovery in the economy, envisaged in this scenario, could see the Irish owned banks eventually return to profitability and recover some momentum by the end of the decade. In addition to the losses by the state on the IBRC, the Government has invested €29 billion in the remaining banks, which it now largely owns. Under this scenario much of the banks' legacy problems should have been dealt with well before the end of the decade. While the exceptional funding costs of tracker mortgages will still remain, the banks should, nonetheless, have returned to profitability. This would be facilitated by the fall in unemployment after 2014, as well as by the growth in the economy.

A recent paper has looked at the profitability of the Irish owned banks and their contribution to value added in the economy over the last twenty years (Everett *et al.*, 2013). This research indicated that in the pre-bubble era of the late 1990s the Irish owned banks' profits were roughly equivalent to 2.5 per cent of GDP. Under those circumstances a possible valuation of the banks would have been around 20 per cent of GDP. However, even after a period of normalisation over the rest of this decade the Irish owned banks will still have legacy costs. However, the objective of the government should be to sell its shareholding in the banks aiming to recover as much as possible of the public funds invested in the banks. If this sale were completed in 2020 one might hope that the proceeds would result in a significant reduction in the level of the national debt.

The Central Bank is currently holding round €28 billion of long dated government debt on its own account (losses and gains accrue to the Central Bank of Ireland, and hence to the Irish government, rather than to the ECB). This holding is

deemed to be for monetary policy purposes. While a limited amount must be sold before the end of the decade the bulk will be held until there is a "normalisation" of the financial environment. A reasonable characterisation of this "normalisation" would be when the risk premium reaches a long-term stable equilibrium – here taken to be 0.7 percentage points. This would be achieved in the *Recovery* scenario by the end of 2020. At that point the Central Bank of Ireland should sell the debt. (Presumably the sale would take place over a sufficient period that it would not significantly affect the market price for the debt.)

The long dated variable rate debt held by the Central Bank was issued earlier this year with a risk premium of 2.7 percentage points. As noted above, under this scenario the risk premium would have fallen to 0.7 percentage points by the end of 2020. If the Central Bank sold the debt under those circumstances it would realise a capital gain of just under 3 per cent of GDP or 3.5 per cent of GNP.

Finally, as discussed by FitzGerald and Morgenroth (2012), establishing Irish Water as a fully self-financed state owned utility would have a number of advantages. One of these would be that it would be self-financing. Under these circumstances it would raise debt to fund part of its needs, debt which would not be part of the government's debt. This would mean that the government could look to a reduction in the national debt (or avoid an increase in debt) of around 2 percentage points, even though it would still remain the owner of the utility.

When taken together, a successful implementation of the *Recovery* scenario could thus see the government being able to further reduce its indebtedness by realising additional financial assets. This could see the net debt to GNP ratio being reduced from the 93 per cent shown in Table 5.1 to between 70 and 75 per cent of GNP by the end of 2020 (c. 60 per cent of GDP).

Conclusions

The scenario set out here is only one of a range of possible outcomes. Even if the EU recovery occurs in line with the assumptions made here, it is quite possible that the Irish economy could still underperform relative to this scenario. The biggest risk of a domestic policy mistake lies with a possible failure to resolve successfully the continuing problems in the financial system. In addition, failure to implement suitable labour market policies could see the opportunity to reduce the level of unemployment being missed.

The recovery envisaged in the domestic economy in this scenario might either suffer a major delay or might be much less robust if the financial system is unable to fund such a recovery. Also if the state fails to maximise its return on the huge sums it has had to put into the banks, this could represent a significant long-term loss to the economy. A failure to ensure that the banks recover as much as possible of their outstanding losses would not only forgo a future return for the state, but it could also require a further capital injection into the banks. Any such outcome could endanger a recovery in the economy. The *Delayed Adjustment* scenario explores the possible consequences of such a policy failure.

5.3   Delayed Adjustment

In the scenario examined in this section, it is assumed that the EU economy recovers along the lines assumed in the *Recovery* scenario. However, the recovery in the Irish economy is assumed to be impaired. As discussed in Chapter 3, there is a range of possible reasons why this might happen. Here we concentrate on how a failure to tackle the ongoing problems in the financial system could seriously impact on the possibility of an economic recovery in the next few years. We concentrate on the possible effects of such a failure over the next five years to 2018.[34]

The *Recovery* scenario assumes that domestic policies will succeed in restoring the banking system to a position where it can fund a recovery in investment and overall economic activity over the medium term. It also assumes that the current high rate of household deleveraging gradually eases by the middle of this decade as households have largely completed the repair of their balance sheets following the financial crisis. Finally, it assumes no further state injection into the banking system.

There are several risks to these assumptions which, if realised, could weigh on domestic demand over the medium term, thereby holding back the recovery in overall activity. The risks include:

- Irish banks' transition from crisis resolution to repair and normal functioning could be delayed, resulting in restricted credit supply to SMEs and households. The lack of available finance could smother business expansion and restrict the recovery in housing and other investment (O'Toole and Gerlach-Kristen and O'Connell, 2013). Box C discusses current evidence on credit conditions in the SME sector).

- Household consumption could remain subdued if the process of deleveraging and balance sheet repair takes longer than anticipated.

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[34]   Data for the years after 2018 are available separately from the authors.

- A failure or delay in resolving the problem of the large number of households currently in mortgage distress could have a scarring effect on consumer confidence and inhibit those households' ability to contribute to the recovery in the economy (Lydon, 2013).

- Any provision of further state funding to cover extra losses in the Irish financial sector would increase government debt and debt interest payments and result in lower growth.[35]

The realisation of one or more of these risks over the coming years has the potential to derail the Irish economy, resulting in a significantly worse outcome than envisaged in the *Recovery* scenario. In the rest of this section, we explore the sensitivity of Ireland's growth prospects to this alternative set of assumptions. Although the *HERMES* model does not contain a detailed treatment of processes such as deleveraging and the impact of credit constraints, by drawing on microeconomic evidence for the Irish economy, it is possible to use the model to mimic the transmission of such shocks to the domestic economy.

In discussing the results of the shock we focus on the implications for output, labour market, public finances and living standards. To illustrate the possible cost of domestic policy failures, the main results of the *Delayed Adjustment* shock are, where relevant, compared to the projections under the *Recovery* scenario.

The demographic assumptions underlying this *Delayed Adjustment* scenario are set out in Chapter 4. In the case of the public finances we assume that the General Government Deficit/Surplus, expressed as a percentage of GDP, is held at the same level as in the *Recovery* scenario. As discussed earlier this is achieved by varying the rate of tax on personal income. This means that the fiscal stance is, de facto, more restrictive under this scenario than under the *Recovery* scenario.

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[35] The need for additional funding could arise for a range of different reasons. Examples would include: unexpected costs in winding up IBRC; possible losses in NAMA; and possible additional capital needs for the banking system.

BOX C: Credit Capacity and Economic Recovery

Conor M. O'Toole

The financial crisis in Ireland has brought to the fore concerns regarding the functioning of financial intermediation. For the real economy to recover, adequate credit must be available to firms and households; firms need financing for investment and working capital while households need credit to smooth consumption and invest in assets. Indeed, international research on recoveries from banking crises notes the existence of post-crisis credit constraints as a considerable drag on growth (Abiad *et al*., 2011; Davis and Stone, 2004). This box provides a summary of the recent research focusing on credit access in Ireland and highlights some concerns for potential recovery scenarios.

As shown in Figure C1, private sector credit in Ireland exploded in the period prior to the financial crisis; lending to households increased from €57 billion in January 2003 to a peak of €157 billion in May 2008; lending to non-financial corporations (NFCs) increased from over €46 billion to just under €170 billion in August 2008. Since the crisis, outstanding credit to households and NFCs has fallen by 33 per cent and 51 per cent respectively from peak to trough. While considerable banking sector deleveraging is necessary, a key question is whether the reduction in loan volumes is causing credit supply constraints for households and firms.

FIGURE C1 Evolution of Credit to Real Economy in Ireland

Monthly Credit Stocks (€ Million)

Peak to Trough Decline (% of Peak)
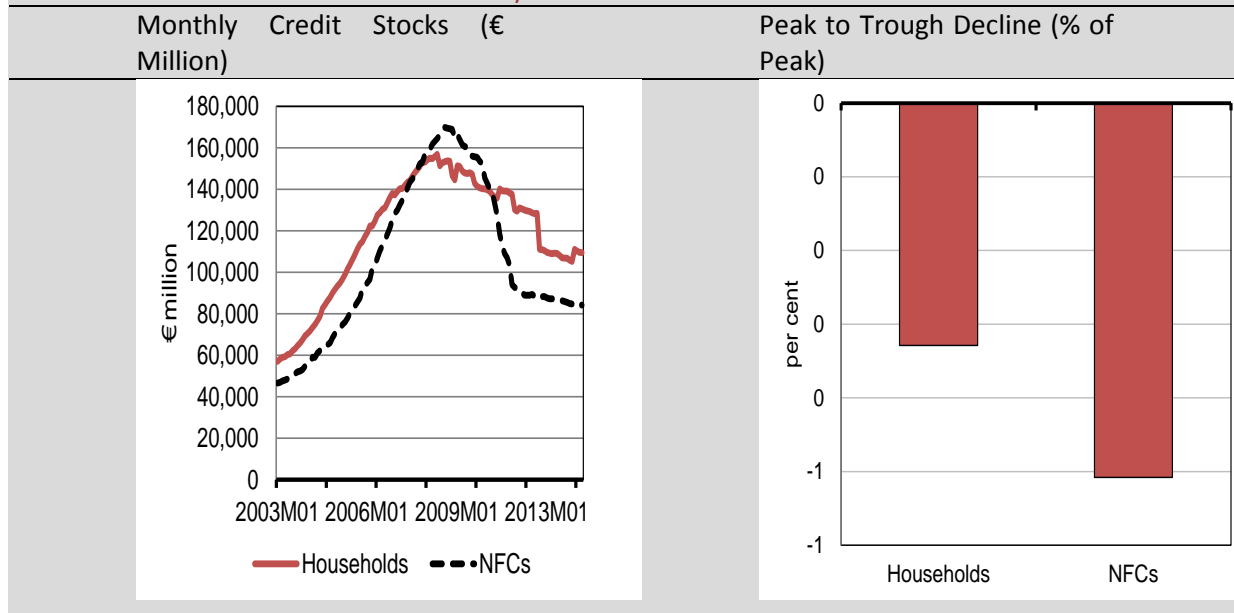
Source: Central Bank of Ireland Table A.5: Loans to Irish Private Sector and authors calculations.
Note: NFCs – Non financial corporations.

The issue of credit access for firms in Ireland, and SMEs in particular, has received much attention since the onset of the crisis. This has resulted in numerous studies, both academic and policy oriented, providing insight into SMEs credit market experience since the crisis (Forfás, 2012; Holton *et al.*, 2012; Holton and McCann, 2012; Lawless and McCann, 2011 and 2012; NESC, 2012; DKM, 2013). In

general this work has established access to finance as a core constraint to SMEs operating in Ireland. Given this backdrop, there has been a very active and engaged policy response with the establishment of the Credit Review Office, setting SME lending targets for the pillar banks, and the many bank and non-bank finance measures outlined as part of the *Action Plans for Jobs* 2012 and 2013.

However, any assessment of the effect of access to finance on SME performance must be conducted within the context of the general problems facing firms in Ireland. Such an evaluation must also be mindful of the role that banks must play in efficiently allocating capital in an environment where borrower specific risk is heightened. Recent research by O'Toole, Gerlach-Kristen and O'Connell (2013) highlights the fact that since the onset of the crisis in 2009 until September 2012, the biggest self-reported problem facing SMEs in Ireland has been finding customers (aggregate demand). Finding customers has also been a larger problem in Ireland than the Eurozone average (as shown in Figure C.2). This is unsurprising given the considerable decline in aggregate consumption since the crisis (O'Connell *et al.*, 2013; Gerlach-Kristen, 2013) and the reliance of a majority of SMEs on the domestic economy.

FIGURE C2 Problems Facing Firms – Ireland – Eurozone - % of Respondents

Problems Facing Firms – Ireland - Eurozone	Loan Rejections and Cost of Finance
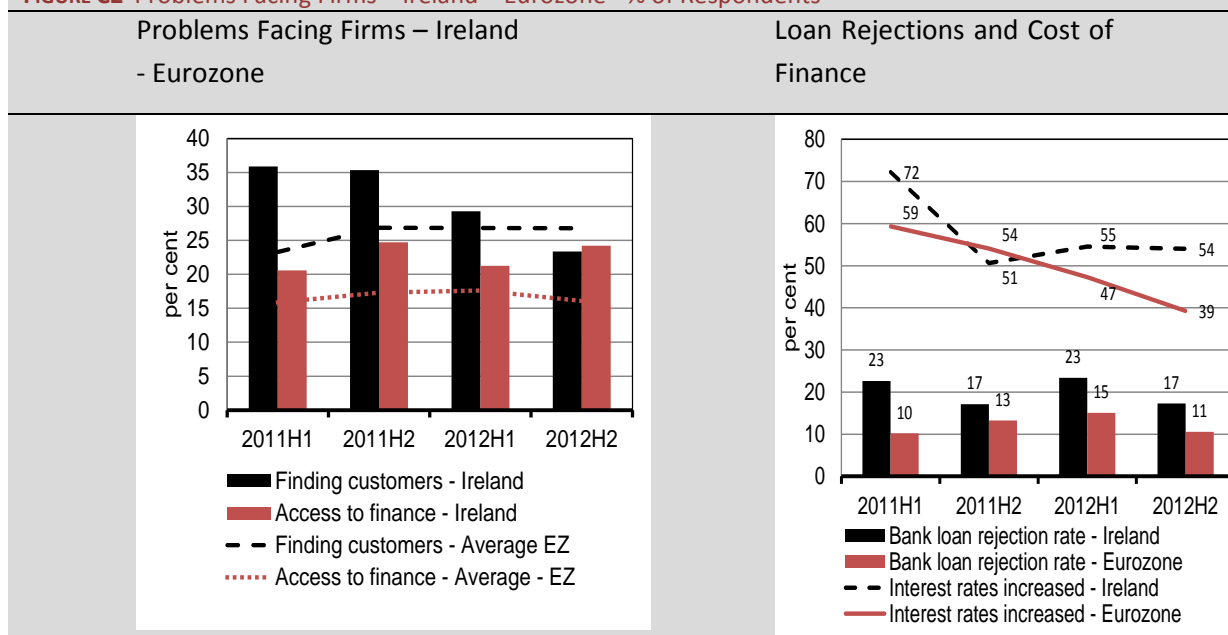
Source: ECB SAFE data.

Up to September 2012, access to finance was the second or third most reported problem facing Irish SMEs. Such firms are also reporting higher loan rejection rates and interest rate increases than European peers (Figure C2). However, this may be reflective of the more challenging operating environment and the inherent borrower risk. To therefore classify enterprises as credit constrained, they must have profitable projects and viable ongoing operations at the current market cost of capital. Applying this definition to recent data from the

Department of Finance/RedC, O'Toole, Gerlach-Kristen and O'Connell (2013) estimate that one in nine Irish firms (11 per cent of total) faced credit constraints between April to September 2012. They find that constraints are most prevalent for younger and smaller firms and for firms operating in the construction, real estate and hotel sectors (Figure C3). Also presented in Figure C3 are the shares of new loans and the stock of outstanding loans by sector. If a sector is experiencing a lower share of new lending to the share in its stock, this indicates that its stock is declining. This is occurring in the construction and hotel sectors, two of the sectors identified as facing higher constraints. While a reduction in lending to these sectors is expected as the banking sector continues deleveraging, this may present challenges to the operation of firms in these sectors. Additionally, given the level of indebtedness of Ireland's NFCs, their continued deleveraging also makes it difficult to ascertain what the optimal credit structure will be in any recovery.

FIGURE C3 Credit Constraints and Lending − Ireland

Share of Constrained Firms per Sector (April – September 2012)	New Lending by Sector (2012)* Vs Stock (Dec 12) - % of Total
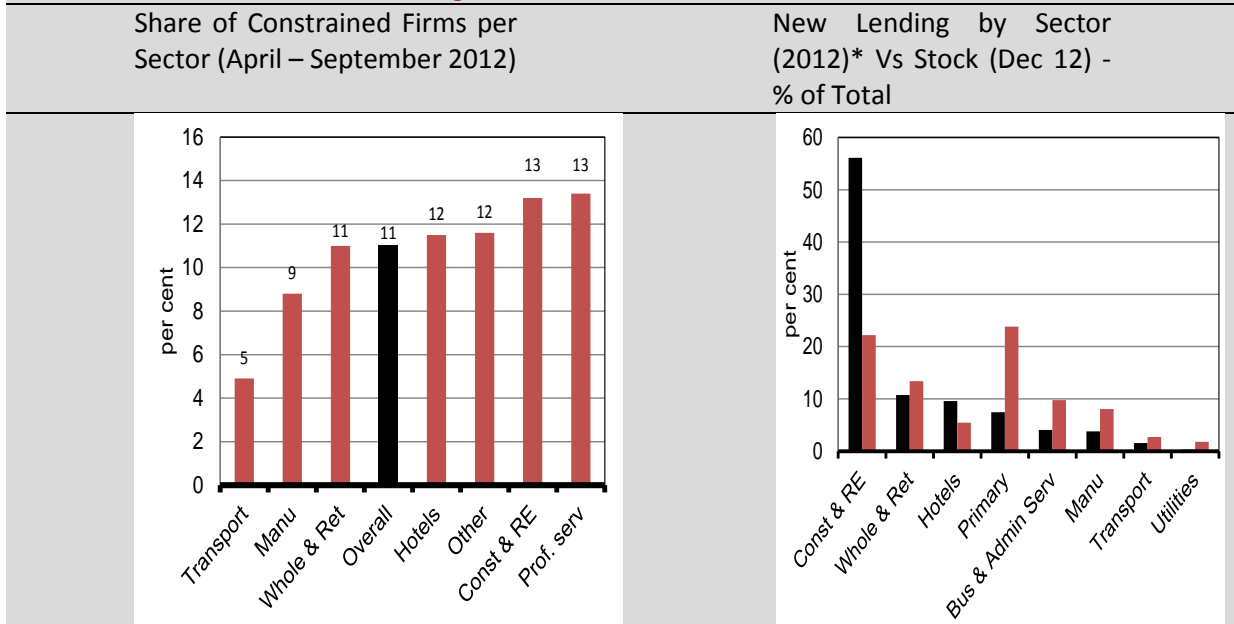
Source: O'Toole et al. (2013), Department of Finance/RedC data and Central Bank of Ireland
* As a percentage of new lending excluding financial intermediation. Chart updated from McCann (2013)

Finally O'Toole, Gerlach-Kristen & O'Connell (2013) note that the most recent ECB SAFE data seem to indicate that concerns about access to finance are increasing and the problem of finding customers is declining in relative importance. If growth picks up, credit demand is sure to increase. Uncertainty remains as to whether the financial system has the capacity to cater for such demand.

On the household side, recent microeconomic research has shown that, since the crisis, credit constraints are having a binding effect on a considerable portion of households in Ireland. Gerlach-Kristen (2013 a;b) finds that young households in Ireland dramatically reduced their consumption below income after the onset of the financial crisis. This fall in consumption stands in stark contrast to the

experience of older households. The research finds that younger households are reducing consumption and building up savings due to the risk of being constrained. This effect is most likely to occur for households in negative equity or for households with an unemployed household head. Given the debt overhang for many households, the requirement to service and pay-down such outstanding balances is also potentially detrimental to their consumption. Recent work by Lydon (2013) shows that households in Ireland with debt problems spend 18 per cent less than those without.

Given the importance of consumption for domestic activity, ensuring adequate credit to households is vital for economic recovery. Providing such financial capacity should also be supportive of SME development, given the reliance of such firms on domestic demand. However, the absence of data on household applications for finance makes it more difficult to provide detailed analysis on credit supply and demand, as can be completed for SMEs. Such survey data would be a welcome complement to the current data available on SMEs.

As Ireland looks towards a medium term recovery, there remain considerable downside risks emanating from the ability of the restructured domestic financial sector to intermediate credit to households and firms. These risks arise due to a number of factors including bank funding, the risk appetite of lenders as well as the lack of competition in the banking sector. In fact, international evidence indicates that a lack of banking sector competition increases credit constraints (Ryan, O'Toole, and McCann, 2013; Chong *et al.*, 2012; Carbo *et al.*, 2009). With only two pillar lenders in the Irish system, the risk of constraints arising from a lack of competition is considerable (McCann and McIndoe-Calder, 2012). Ensuring the system can efficiently and effectively transmit finance to firms and households will be essential for a sustainable domestic recovery.

The Transmission of a Domestic Economy Shock

This scenario examines the effects of persistent credit constraints for households and Small and Medium sized Enterprises (SMEs), prolonged deleveraging by Irish households and higher government debt as a result of a further once-off capital injection related to the financial sector. Beginning in 2013, there is assumed to be a large and continuous rise in the household savings rate until 2018 (Figure 5.15). By the end of this decade the savings ratio would remain elevated at over 10 per cent, higher than the rate recorded in 2009 and substantially above its long-run historical average. This would reflect the fact that the normal repayment of debt by some households would not be offset by significant new lending to other households, resulting in increased saving in national accounting terms. To proxy the impact of credit constraints, output in the distribution sector (which has a high concentration of SMEs) is reduced by 2.5 percentage points per annum until 2017. We assume that distribution sector investment (a proxy for the overall services sector) is held unchanged until 2020.

FIGURE 5.15 Savings Rate, Percentage of Disposable Income
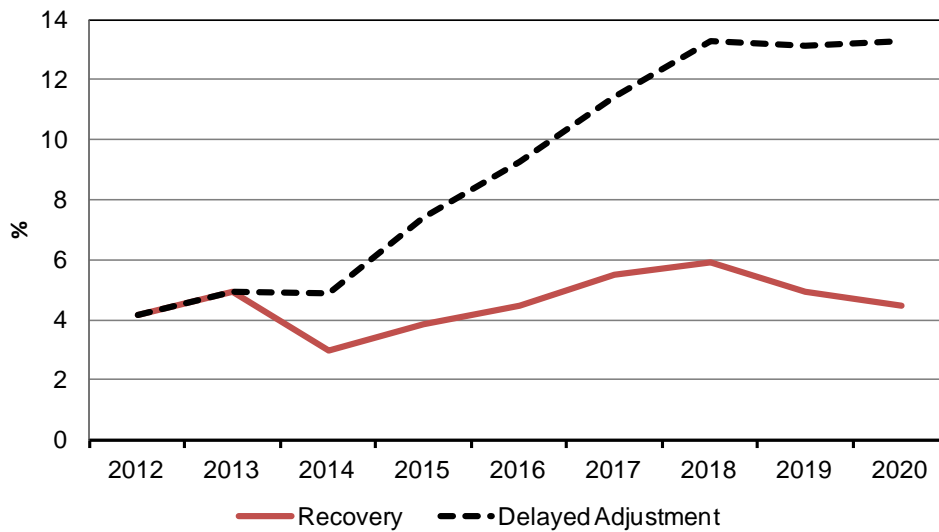
In the *Recovery* scenario, the level of housing completions is projected to increase to the level consistent with long-run demand by around 2016. This assumes that the banking system will have been fully resuscitated and will be in a position to fund a return to more normal levels of housing completions. It is possible that the adjustment back to more sustainable levels of housing completions could be postponed well into this decade if mortgage credit is restricted. We have calibrated the impact of such a shock, arising from credit constraints, by assuming that housing completions remain unchanged at 10,000 per annum for the period 2013 to 2018.

On the public finances, we assume there is a once-off capital injection for the financial sector in 2014 of €7.5 billion, adding to borrowing in that year. [36] This is a purely illustrative assumption and is not based on any analysis of the likely capital needs of the financial sector over the coming years. It is simply designed to show, in a stylised fashion, the impact of an increase in government indebtedness on the economy's medium-term growth path. Using the calibration in *HERMES*, the rise in government debt following the capital injection would produce a spike in the risk premium in 2015. This increase in the government risk premium would feed through to the cost of capital in manufacturing and the other sectors of the economy in subsequent years, thereby further impairing the supply of credit in the economy.

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[36]   The need for additional funding could arise for a range of different reasons. Examples would include: unexpected costs in winding up IBRC; possible losses in NAMA; and possible additional capital needs for the banking system.

TABLE 5.3   Delayed Adjustment Scenario, Major Aggregates

	2012	2013	2014	2015	2016	2017	2018
GDP	0.9	1.8	1.9	2.7	1.9	2.7	3.0
GNP	3.3	1.3	-0.9	3.0	1.1	2.8	3.1
Consumption	-0.9	-0.2	-3.5	-1.3	-2.7	-0.1	1.1
Investment	-2.3	2.6	3.0	10.6	8.0	15.7	1.6
Employment	-0.6	0.6	0.3	1.2	0.4	0.4	1.3
Output, Industry	0.3	1.6	5.8	6.3	4.0	4.6	4.2
Output, Market Services	3.9	0.7	1.2	2.2	1.5	2.6	2.9
Productivity, Manufacturing	3.9	2.4	5.4	7.3	5.5	5.8	7.7
Productivity, Market Services	4.1	0.1	0.2	0.0	1.2	3.2	0.4
Prices, Consumption	1.8	1.4	2.0	2.2	2.5	2.6	2.4
Prices, Housing	-2.0	2.1	-0.5	3.8	-2.2	1.3	2.5
Non-Agricultural Wage Rates	1.4	0.8	1.0	2.3	4.4	5.4	4.8
Personal Savings Ratio	4.1	5.0	4.9	7.4	9.3	11.4	13.3
General Govt. Deficit (including banks)	7.6	7.3	9.2	3.2	1.2	0.3	-0.4
General Govt. Deficit (excluding banks)	7.6	7.3	4.9	3.2	1.2	0.3	-0.4
General Government Debt, Net, % of GNP	122	128	139	135	132	124	117
Current Account (adjusted), % of GNP	-0.1	0.2	2.0	4.7	6.4	6.9	8.7
Unemployment Rate, % of Labour Force	14.5	13.9	13.8	12.9	13.5	13.1	11.9
Net Emigration, 000s	34	35	20	19	10	20	18
Housing Completions (000)	8.5	10.0	10.0	10.0	10.0	10.0	10.0
Investment/GNP ratio	12.2	12.5	13.0	14.0	14.9	16.9	16.6
	85-90	90-95	95-00	00-05	05-10	10-15	15-20
GDP	3.3	4.0	9.2	4.8	0.1	1.8	3.3
GNP	2.8	3.8	8.4	4.0	-0.3	0.9	3.2
Consumption	3.0	3.0	8.3	4.5	0.8	-1.7	1.1
Investment	4.4	3.0	12.7	6.7	-12.0	0.1	8.1
Employment	1.0	1.9	4.9	3.2	-0.7	-0.1	1.4
Output, Industry	6.7	7.6	11.9	5.0	1.4	3.1	5.0
Output, Market Services	3.5	3.1	9.2	4.1	-0.1	2.0	3.1
Prices, Consumption	3.5	2.9	3.4	3.5	0.3	1.8	2.4
Prices, Housing	7.1	3.5	16.8	10.3	-3.7	-0.2	3.2
Productivity, Manufacturing	7.3	7.1	8.6	6.3	8.2	4.9	6.6
Productivity, Market Services	1.8	0.0	2.7	0.4	-0.6	1.4	1.5
Non-Agricultural Wage Rates	5.1	4.4	5.9	5.8	1.5	1.3	4.5
General Government Deficit (including banks), % of GDP	3.7	2.5	-2.2	-0.8	9.9	8.0	-0.2
Current Account (adjusted), % of GNP	-1.6	1.8	1.3	-0.6	-5.1	0.6	8.1
Unemployment Rate, % of Labour Force		0.0	14.8	8.1	4.4	8.1	13.9
Housing Completions (000)	22.0	24.2	42.2	67.4	52.8	9.8	12.7
Investment/GNP ratio	18.8	18.4	24.5	27.9	23.9	12.9	16.8

In this scenario we have also assumed that the government would react to the adverse impact on the Budget arising from the loss of output by raising income taxes to ensure that the borrowing requirement would be unchanged in the

longer term compared to the *Recovery* scenario. We also discuss a scenario where the government allows the deficit to rise.

Results for the *Delayed Adjustment* Scenario

Figure 5.16 shows the path of GNP under the *Delayed Adjustment* and under the *Recovery* scenarios. The cost of domestic policy failures, resulting in a prolonged domestic slump, is reflected in a fall in the average growth rate of GNP to 1.7 per cent over the period 2013 to 2018 compared to 2.8 per cent in the *Recovery* scenario (Table 5.3). By 2018, the level of both GNP and GDP would be over 6 per cent lower than in the *Recovery* scenario.

FIGURE 5.16   Alternative Scenarios for Real GNP
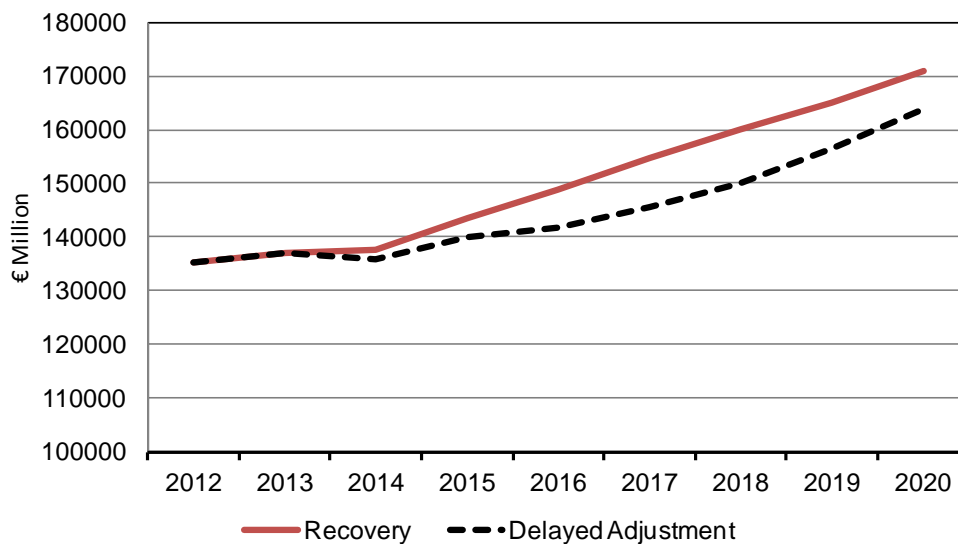
The elevated level of the savings rate, well above that in the *Recovery* scenario, would result in substantially lower consumption. In the *Recovery* scenario, consumption improves gradually by the middle of this decade and then grows at a stronger pace out to 2020. In contrast, a recovery in consumption would fail to materialise under the *Delayed Adjustment* scenario, leaving the level of real consumption 14 per cent below the *Recovery* scenario by the end of this decade.

Under the *Delayed Adjustment* scenario, access to credit for SMEs is assumed to remain constrained over the forecast horizon. As a result, the recovery in investment from the trough reached during the financial crisis would be significantly more subdued than in the *Recovery* scenario. Figure 5.17 shows the path of the investment/GNP ratio under both scenarios. As the manufacturing sector is predominantly foreign-owned and, therefore, has less reliance on the domestic banking system for access to finance, the lack of credit would

predominantly affect indigenous firms in the traditional and services sectors of the Irish economy.

FIGURE 5.17 Alternative Scenarios for Investment/GNP Ratio
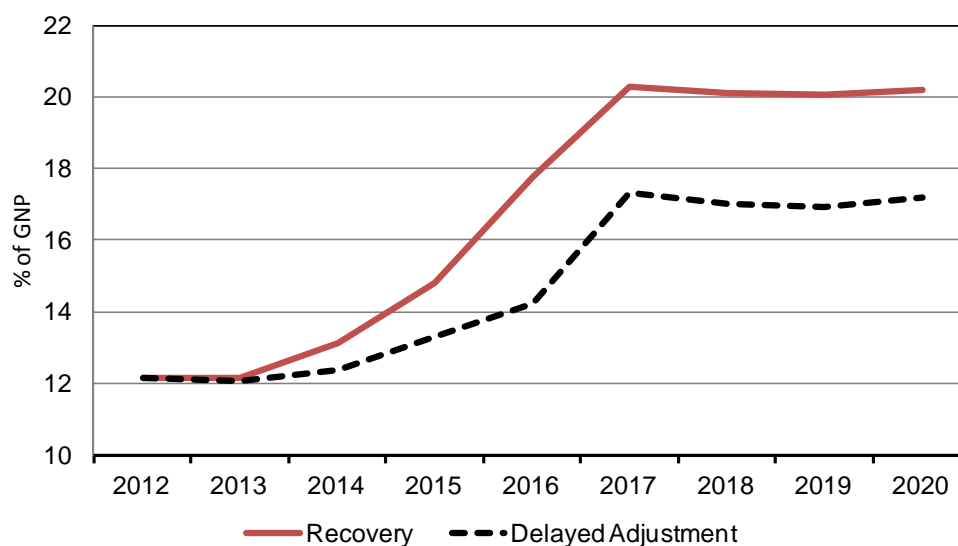
With insufficient bank lending to fund the recovery, investment and output in both manufacturing and services would be lower compared to the *Recovery* scenario. Annual average growth in market services would be close to one percentage point lower over the period 2013 to 2018 compared to the *Recovery* scenario. This would reflect, in particular, the subdued performance of the distribution sector, with investment and output both substantially weaker than profiled in the *Recovery* scenario.

Investment would also be negatively impacted by the increase in the risk premium on government debt arising from the assumed state-funded capital injection into the banks in 2014. This increase in the government risk premium would make the cost of borrowing for both households and firms, more expensive than in the *Recovery* scenario. As a result, credit constraints are assumed to work through both the price and quantity channel.

Tight credit conditions would also impact on the building and construction sector, with the level of housing completions out to 2018 remaining close to the record low recorded in 2012. The demand for housing is particularly sensitive to changes in disposable income and the high unemployment and weak balance sheet position of households under this scenario, in addition to a lack of mortgage credit, could precipitate a further lengthy period of low activity in the housing market.

The underperformance of the economy, the loss of output in the industrial and services sectors and the absence of any sustained improvement in consumer spending would have serious implications for employment under this scenario. By 2018, total employment would be 6 per cent (or 118,000) lower than in the *Recovery* scenario. The scale of this loss of employment would further erode confidence and increase uncertainty about the future.

Whereas under the *Recovery* scenario the unemployment rate declines gradually to just over 8 per cent by 2018, the protracted weakness of the economy in this scenario would result in a long drawn out episode of high unemployment (Figure 3.33). The overall unemployment rate would remain close to 13 per cent until 2017. This would occur in spite of substantial emigration, with the outward flow of labour continuing uninterrupted until 2020.

FIGURE 5.18   Alternative Scenarios for the Unemployment Rate
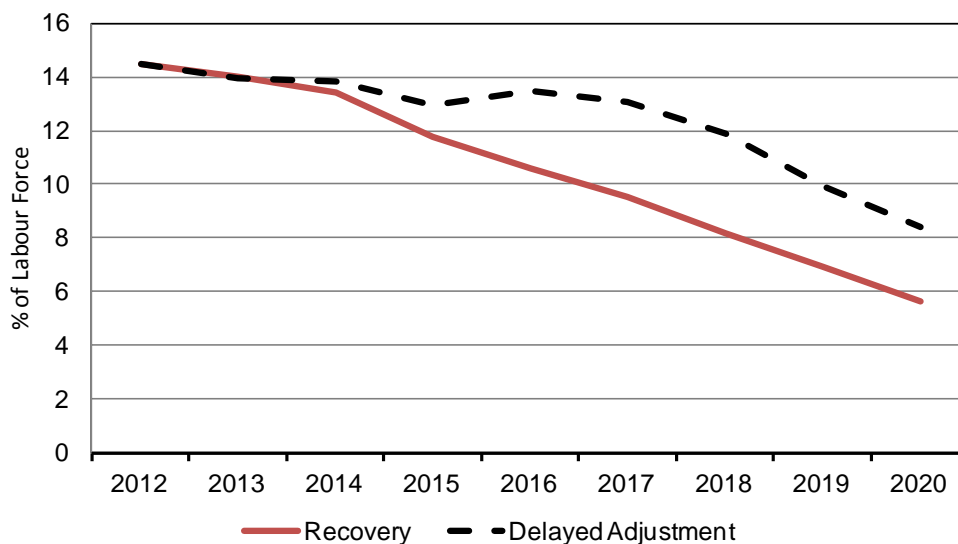
Faced with this very unfavourable situation, as discussed in Chapter 4, we make the technical assumption that the government would react to the severe loss of revenue and the increase in transfers to the unemployed by increasing the personal income tax rate.[37] As a result, there would be no increase in government borrowing, despite the decline in government revenue. To keep the budget balance at the same level as in the Recovery scenario would imply a very large rise in the personal income tax rate if all of the adjustment was concentrated on this measure. The imposition of this additional fiscal consolidation in a pro-cyclical manner, which would be necessary to prevent government borrowing

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[37]   In the *HERMES* model we need to assign the task of keeping the deficit on track to one fiscal instrument. It would be possible to also achieve this task by cutting employment or public investment. Use of other instruments would make some difference to the results but would not change the headline effects of the fiscal tightening.

from rising further, would aggravate the difficulties faced by the economy under this scenario.

If, instead, the government allowed the deficit to rise without responding, the impact on the public finances would be quite large. By 2018 the deficit would be over 3 percentage points of GDP higher than in the *Recovery* scenario. Such a "neutral" fiscal policy would provide some insulation to the economy from the shock to the domestic demand, and GNP would be 2 per cent higher by 2018 than in the scenario where the borrowing requirement does not rise. Given the high levels of debt and the fragility of the state's overall financial position, such a neutral fiscal policy stance would not be feasible. Furthermore, with the government's cost of borrowing linked to the overall level of debt, extra fiscal consolidation might be necessary to prevent a damaging increase in the interest rate for both government and the private sector.

This scenario shows that a failure to maintain policy vigilance in a number of key areas, for example in relation to on-going efforts to remedy the problems in the financial system, could mean that the Irish economy would fail to realise its potential over the next decade. This would result in lower growth and higher unemployment and emigration. Income per head, as measured by GNP, would also improve more slowly than in the *Recovery* path set out in Section 5.2, a scenario which already embodies a significant permanent loss of output. This outcome would constitute an expensive and irredeemable loss to the economy and society and these results highlight the urgency of implementing the necessary domestic policy measures in banking, the labour market and the public finances. We return to this theme in the conclusions.

5.4   Stagnation Scenario

This scenario was generated by taking the *Recovery* scenario in the *HERMES* model and changing the external assumptions as outlined in Chapter 4. The model then generated the changes in the domestic economy that the revised external assumptions would imply.

In this scenario the economy would still record some growth in GNP each year from 2015 onwards. However, in contrast to the *Recovery* scenario, the pace of recovery would be extremely sluggish (Table 5.4). Over the period 2010-15 growth in GNP would average only 0.8 per cent a year followed by growth of 1.1 per cent a year to 2020 (Figure 5.19). Thereafter growth might average between

TABLE 5.4 Stagnation Scenario, Major Aggregates

	2012	2013	2014	2015	2016	2017	2018	2019	2020
GDP	0.9	1.7	3.5	1.3	1.1	2.0	0.8	1.3	2.0
GNP	3.3	1.2	0.0	1.9	0.6	2.1	0.4	0.9	1.7
Consumption	-0.9	-0.2	1.8	0.0	1.4	1.1	-0.8	0.4	1.3
Investment	-2.3	-0.5	6.3	9.5	7.1	23.1	-1.1	0.2	2.5
Employment	-0.6	0.4	1.2	0.8	-0.3	0.9	0.2	0.0	0.4
Output, Industry	0.3	1.3	8.9	4.6	2.5	4.3	2.4	2.8	3.2
Output, Market Services	3.9	0.6	2.0	-0.2	0.3	1.3	-0.1	0.7	1.7
Productivity, Manufacturing	3.9	2.4	8.2	7.3	5.9	5.0	6.6	7.0	6.1
Productivity, Market Services	4.1	0.1	-0.3	-1.9	0.5	2.1	-1.6	-0.5	0.4
Prices, Consumption	1.8	1.4	3.2	2.2	2.1	2.0	2.0	2.0	1.9
Prices, Housing	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
Non-Agricultural Wage Rates	1.4	0.8	0.8	2.3	3.3	2.8	2.6	3.4	3.0
% of GDP									
Personal Savings Ratio	4.1	4.9	3.5	4.1	4.7	5.6	5.4	4.1	3.5
General Govt. Deficit (including banks)	7.6	7.3	4.5	2.7	2.5	2.0	0.6	0.6	0.7
General Govt. Deficit (excluding banks)	7.6	7.3	4.5	2.7	2.5	2.0	0.6	0.6	0.7
% of GNP									
General Government Debt, Net	122.1	128.4	126.0	124.4	124.7	122.3	120.4	118.1	115.3
Current Account (adjusted)	-0.1	0.5	2.9	4.2	3.1	1.0	2.1	2.3	2.2
Unemployment Rate, % of Labour Force	14.5	14.1	13.1	12.5	13.4	12.8	12.5	12.3	11.8
Net Emigration, 000s	34	35	25	22	22	22	22	22	22
Housing Completions (000)	8488	9503	8405	10000	10000	16527	16075	14207	12588
Investment/GNP ratio	12.2	12.1	12.4	13.3	14.3	17.3	17.0	16.9	17.2

Average Annual % Change									
	85-90	90-95	95-00	00-05	05-10	10-15	15-20	20-25	25-30
GDP	3.3	4.0	9.2	4.8	0.1	1.8	1.4	1.4	1.8
GNP	2.8	3.8	8.4	4.0	-0.3	0.8	1.1	1.5	2.0
Consumption	3.0	3.0	8.3	4.5	0.8	-0.4	0.7	1.5	1.3
Investment	4.4	3.0	12.7	6.7	-12.0	-0.1	6.0	2.5	3.2
Employment	1.0	1.9	4.9	3.2	-0.7	-0.1	0.3	0.3	0.8
Output, Industry	6.7	7.6	11.9	5.0	1.4	3.4	3.0	2.6	2.4
Output, Market Services	3.5	3.1	9.2	4.1	-0.1	1.7	0.8	0.6	1.8
Prices, Consumption	3.5	2.9	3.4	3.5	0.3	2.0	2.0	2.1	2.0
Prices, Housing	7.1	3.5	16.8	10.3	-3.7	-1.2	0.5	3.3	3.3
Productivity, Manufacturing	7.3	7.1	8.6	6.3	8.2	5.5	6.1	3.1	-0.5
Productivity, Market Services	1.8	0.0	2.7	0.4	-0.6	0.9	0.2	0.4	0.8
Non-Agricultural Wage Rates	5.1	4.4	5.9	5.8	1.5	1.3	3.0	2.6	1.8
Average annual									
General Govt. (including banks), % of GDP	3.7	2.5	-2.2	-0.8	9.9	7.0	1.3	0.8	1.0
Current Account (adjusted), % of GNP	-1.6	1.8	1.3	-0.6	-5.1	0.7	2.1	1.3	2.3
Unemployment Rate, % of Labour Force		14.8	8.1	4.4	8.1	13.7	12.6	10.5	6.8
Housing Completions (000)	21982	24189	42248	67405	52838	9375	13879	15757	16376
Investment/GNP ratio	18.8	18.4	24.5	27.9	23.9	12.5	16.5	18.1	19.3

1.5 per cent and 2.0 per cent a year. This means that the economy would not emerge from the current period of low growth, high unemployment and high debt – the legacy of the crisis. The debt to GNP ratio would show only a limited decline and emigration would persist out to the end of the decade. The impact of the low growth on the public finances would mean that fiscal policy would continue to be contractionary over the rest of the decade.

FIGURE 5.19 GNP, *Stagnation* Scenario, Average Annual Change, %
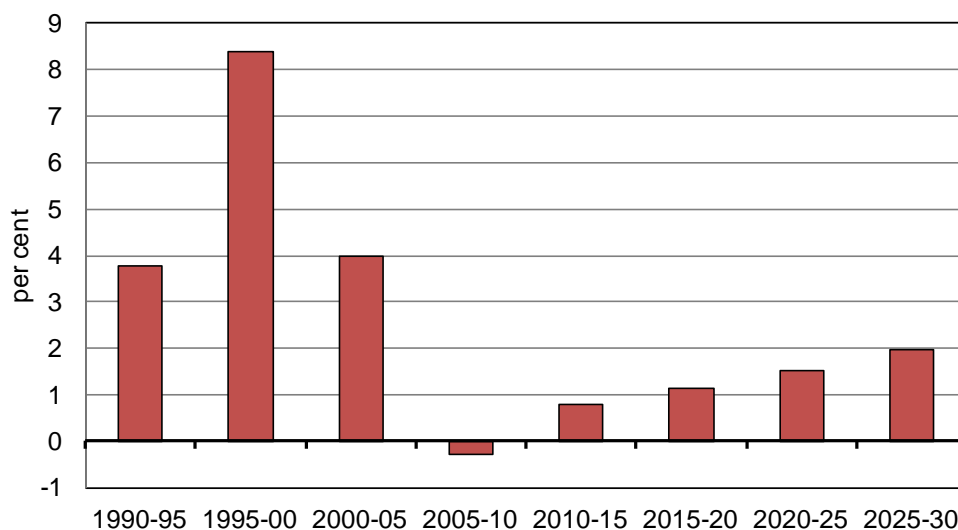
Prolonged stagnation in the international economy would stifle the performance of the tradable sector in this scenario. Merchandise exports would grow at only 1.3 per cent a year between 2015 and 2020 and total exports would grow at around 2 per cent a year. Reflecting the weakness in the international economy and the subdued export performance, the recovery in consumption would be weak and shortlived. There would be some growth in investment from its current exceptionally low level, not least because of a need to replace the existing capital stock as it depreciates.

Subdued growth in output would mean that employment would fail to regain its 2007 level over the period to 2030. Unemployment would fall slightly from its current level of over 14 per cent but it would still stand at just under 12 per cent in 2020. The improvement in the unemployment rate would be driven by the continuing significant outflow of emigrants. Net emigration would be even higher were it not for the fact that, with no growth in the rest of Europe, alternative labour markets would not be much more attractive than the Irish market.

Output

The pattern of growth in industrial output, illustrated in Table 5.4, is rather erratic. This reflects timing issues involving the limited recovery in building output (included in the industrial sector) and also some volatility in the response of the manufacturing sector to the unfavourable external environment. It is probably more useful to look at the average annual growth rates; from 2010-15 industry is likely to have grown by an average of 3.4 per cent a year and this would fall first to 3 per cent a year from 2015-20 and then to around 2.5 per cent a year thereafter. By historical standards this would be a very poor performance and it would not sustain significant growth in domestic demand.[38] This is reflected in the growth rate of 0.8 per cent a year for the market services sector over the rest of this decade.

Domestic Demand

The impact of the low growth in output in the tradable sector, the very poor employment performance and the need to maintain a restrictive fiscal policy would impact on personal incomes under this scenario. Thus, even with a relatively unchanged savings ratio over the rest of the decade, there would be very little change in the volume of consumption. At the end of the decade consumption would still be around 10 per cent below its peak 2007 level. It would only be later in the next decade that the 2007 peak would again be achieved.

In the case of investment the situation would also be very different than under the *Recovery* scenario. The investment to GNP ratio would show some limited rise from its current very low level. However, by 2020 it would only be around 17 per cent of GNP (Figure 5.20). This lower level of investment would reflect the lower desired level of output in Ireland for companies in the tradable sector, as well as the effects of a very weak domestic demand profile impacting on the market services sector. Because of the continuing fiscal tightening, public investment would continue to fall in volume out to 2018.

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[38] As noted in Chapter 3, here we include the fast growing IT services sector in manufacturing.

FIGURE 5.20 Investment/GNP Ratio
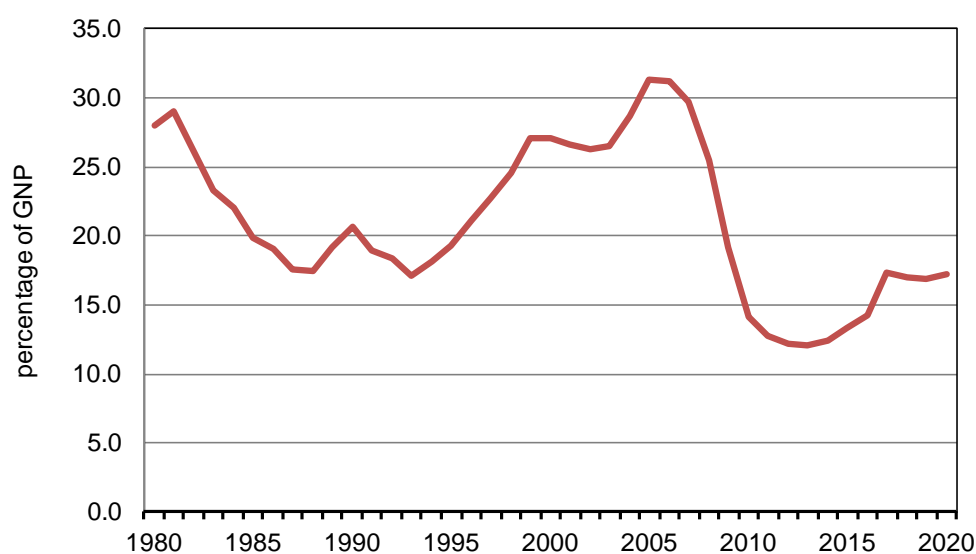
As discussed above, in the *Stagnation* scenario there would be a much higher level of emigration and, hence, a lower adult population in the forecast period. In turn, this would have important implications for the demand for housing. Table 5.5 shows the decomposition of the sources of housing demand in the past and the Demographic Model's estimates for the period to 2030 consistent with the *Stagnation* scenario.

TABLE 5.5 Stagnation Scenario – Decomposition of Housing Demand, Average Per Year, (000)[39]

	1991-1996	1997-2002	2003-2006	2007-2011	2012-2016	2017-2021	2022-2026	2027-2031
Natural Increase	16.5	20.0	27.9	31.6	18.7	20.2	19.5	20.2
Migration	0.0	5.9	17.5	5.4	-6.7	-9.2	-10.5	-11.1
Change in Headship	3.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Vacant	2.4	9.6	21.3	9.6	-7.7	-0.9	0.4	-0.3
Obsolescence	4.9	11.6	13.4	7.0	5.0	5.0	7.0	7.0
Dwellings Built	27.0	48.0	80.0	53.5	9.3	15.0	16.4	15.7

Similar to the *Recovery* scenario, over the coming fifteen years, in the absence of migration, the natural increase in the population would result in the formation of around 20,000 new households each year requiring a separate dwelling. Table 5.5 shows that under the *Stagnation* scenario this increase in demand would be modified by expected emigration, reducing the number of new households formed each year by around 10,000. However, the natural increase in the adult

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[39] The periods used are based on the years when the Census was taken – a key source for the data.

population will still more than offset the effect of this outflow. In addition to this source of demand each year, a certain number of houses disappear either through redevelopment or through dilapidation (obsolescence).

In the period to 2016 it is assumed that each year almost 8,000 vacant dwellings are occupied by new households obviating the need for additional building. However, by 2016 most of the vacant dwellings in high demand locations would have been occupied and new dwellings would be needed to accommodate new household formation.[40] When all of these factors are put together, these results suggest that just under 10,000 new dwellings a year will be needed out to 2016. Thereafter, the number needed under this scenario would rise to around 15,000 a year.

The implication of this analysis is that output in the 2015-20 period would need to be 50 per cent higher than it is today to meet the needs of the likely growing number of households. Because of the limited nature of this demand, it would be likely that house prices would show little change in nominal terms in the forecast period, implying some limited further fall in real terms.

Current Account

Having moved into surplus in 2012, the current account, adjusted for the profit of redomiciled PLCs, is likely to remain in surplus over the rest of the decade (Figure 5.21). While borrowing by the government would be largely eliminated under this scenario, the high burden of debt would see the private sector continuing to deleverage. The implications of this process for domestic demand have already been considered. This would imply a significant surplus in the private sector flow of funds as debt is paid down. It would only be in the next decade that this private sector deleveraging would begin to ease.

Labour Market

As discussed in the context of the *Recovery* scenario, domestic demand tends to be more employment intensive than the export-related output of the tradable sector. Thus the very limited growth in domestic demand in this *Stagnation* scenario would result in very little growth in employment in the period to 2020. The high level of emigration would be likely to result in the labour force showing little change over the course of the second half of this decade.

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[40] As discussed earlier many dwellings may remain vacant in low demand regions.

FIGURE 5.21   Current Account Balance, Adjusted, % of GNP
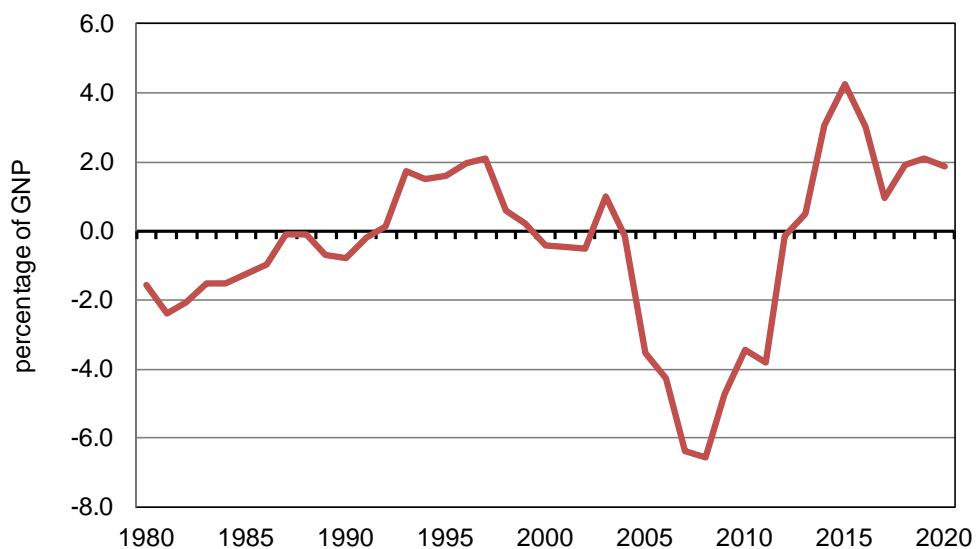
As shown in Figure 5.22, the result of these forecast developments in employment and the labour force would be a very slow reduction in the proportion of the labour force that is unemployed, with a high proportion of those who are out of work being long-term unemployed. While in previous crises the high level of unemployment provoked an increasing level of emigration, in this scenario the EU labour market would be equally unattractive, so that migration is assumed to be stable over the forecast horizon, albeit at a substantial level of outflow.

FIGURE 5.22   Unemployment Rate, ILO
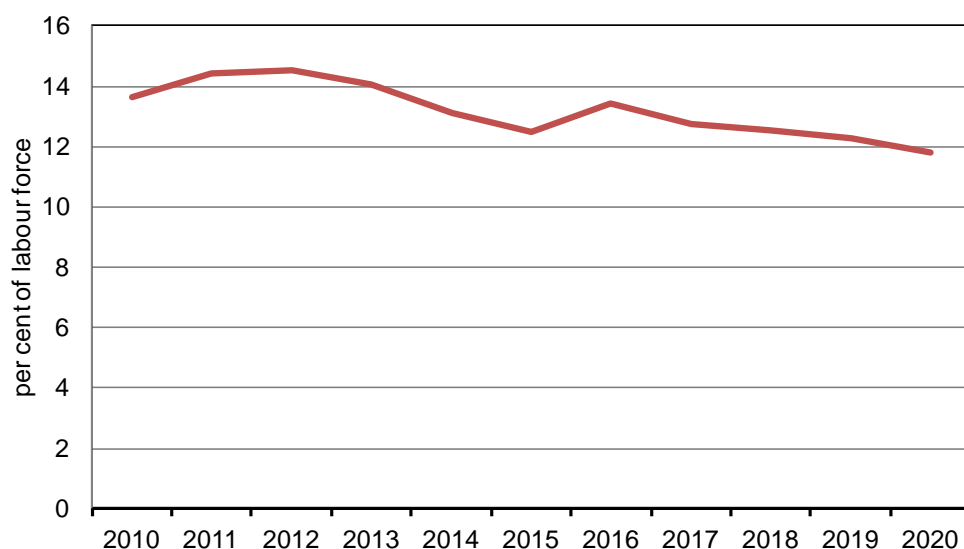
Productivity growth in the manufacturing sector would not be very different from that anticipated in the *Recovery* scenario. It would reflect the long-term trend for high productivity growth in the sector in the past. However, the productivity growth in the market services sector might be somewhat lower as firms hold onto labour with stagnant demand. Generally, productivity in the next decade would grow quite slowly reflecting, inter alia, much more limited investment.

The poor labour market circumstances would have a dampening effect on the growth in non-agricultural wage rates (Table 5.4) over the period to 2020. This slower growth in wage rates than in the *Recovery* scenario would occur in spite of the fact that the tax burden on employees is assumed to rise at the end of the decade to ensure that the budgetary target is met. (Because of the very elastic supply of labour, much of the incidence of taxes on labour is passed through to employers.) This absorption of the tax increase by labour would be unusual by the standards of the past behaviour of the labour market and it would reflect the extremely unfavourable labour market circumstances of this scenario.

As a result of the weakness of the labour market, labour's share of added value would tend to stabilise at a slightly lower level than in the *Recovery* scenario (Figure 5.23). However, with weak external demand this lower labour share would not be sufficient to produce substantial additional growth in the tradable sector through enhanced competitiveness. (Of course if wage rates were higher than shown in this scenario employment would perform even worse – see the analysis in Chapter 6.)

FIGURE 5.23 Labour Share of Value Added (excluding agriculture)
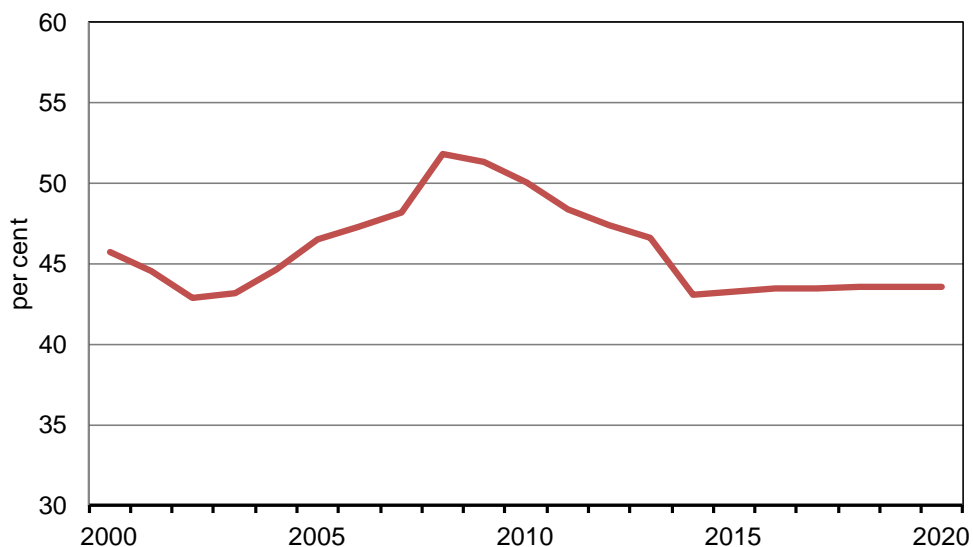
Public Finances

The assumptions underlying the public finances were set out above. Following on the planned tough 2014 Budget these involve a very substantial fiscal tightening towards the end of the decade to get the General Government Deficit down to a target of roughly 0.5 per cent of GDP. The path for the deficit is shown in Figure 5.24. As explained above, in spite of the fact that this target is less stringent than in the *Recovery* scenario in terms of the deficit, it would still involve a much tougher fiscal stance. This is because of the very negative effects on the public finances of the low growth in this scenario.

FIGURE 5.24   General Government Balance, % of GDP
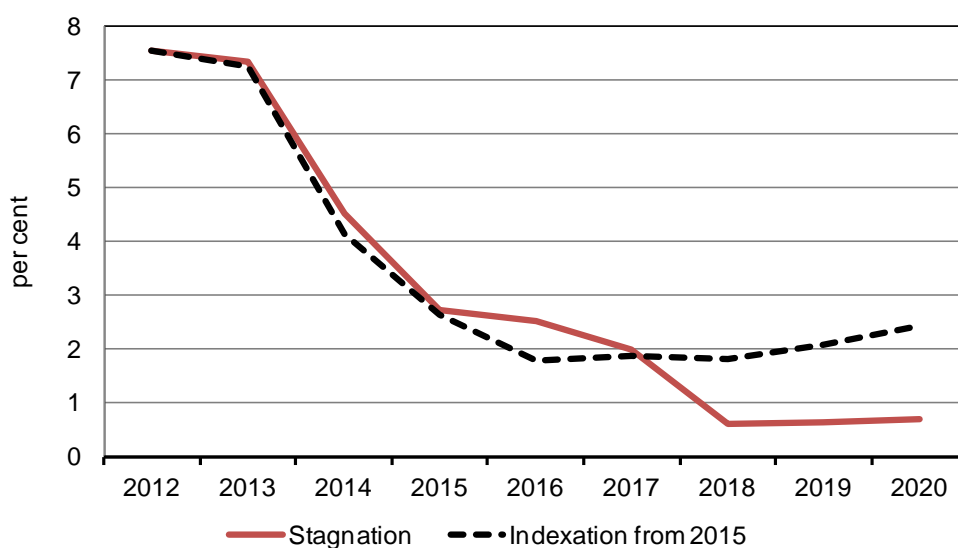
Figure 5.24 also shows the profile the deficit would follow towards the end of the decade if a neutral fiscal stance (indexation) were adopted from 2015 onwards. This indexation assumption would mean that there was no change in the personal tax rate in the period 2018-20. The consequence of such a neutral fiscal policy would be that the deficit would be over 2 per cent of GDP by the end of the decade and on a rising trend. The difference between the indexed deficit and the deficit targeted in this S*tagnation* scenario is a measure of the further fiscal tightening between 2018 and 2020 implied by our assumptions.

Under the *Stagnation* scenario, where there is very little growth in the economy over the rest of the decade, fiscal tightening would have to continue well beyond 2015 if the public finances were to be put on a sustainable path. If the *Stagnation* scenario were fairly certain to happen then possibly a better course might be to implement a much tougher fiscal stance in 2014 and 2015 to meet the sustainability target, avoiding a decade-long period of budgetary cuts. However, as outlined earlier, to take such a policy stance when there is no certainty that

this scenario will actually happen, would be problematic. This issue is discussed in more detail later in Section 5.5.

Figure 5.25 shows government expenditure and revenue as a percentage of GNP. In this scenario government expenditure would stabilise at just over 40 per cent of GNP at the end of the decade. This would be rather similar to the outcome set out in the *Recovery* scenario. Of course the level of public services that this expenditure would buy would be much lower, reflecting the lower level of output in this *Stagnation* scenario.

FIGURE 5.25   Government Expenditure and Revenue, % of GNP
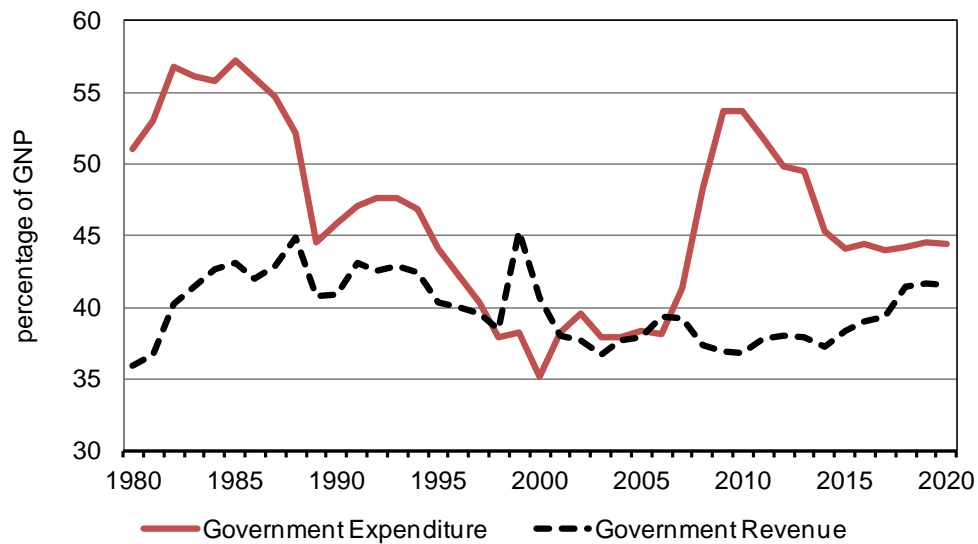
A good measure of the sustainability of the public finances is the ratio of the government debt, net of liquid financial assets, relative to GNP. Figure 5.26 shows the ratio of net debt to GDP and GNP out to 2020. After peaking in 2013/14, under the *Stagnation* scenario the debt ratio would fall quite slowly over the rest of the decade. However, in 2020 it would still be close to 120 per cent of GNP. Under these circumstances any major shock, which reduced the level of GNP below that envisaged in this scenario and which increased the government's debts, could see the debt ratio dis-improving rather than improving. Such an outcome could push the economy onto a steadily deteriorating path towards financial collapse. Thus, while this scenario is potentially sustainable, it would not take a massive shock to render it unsustainable.

FIGURE 5.26 Net Debt/GNP Ratio, %
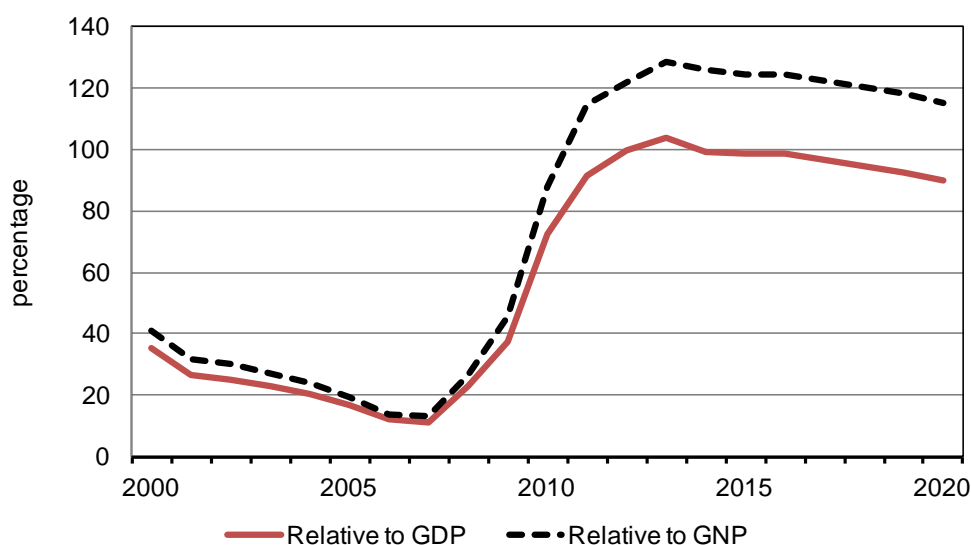
State's Financial Assets and Liabilities

In the *Recovery* scenario we discussed how successful management of the economy could produce a "virtuous circle"; the success of the economy could enhance the potential value of the state's financial assets. In turn, this could lead to a once off reduction in indebtedness, further assisting in the recovery process. However, under this *Stagnation* scenario there is the possibility that the economy could find itself in a "vicious circle"; the poor performance of the economy could, directly or indirectly, increase indebtedness. For example, the banking system, instead of returning to profitability, could require a constant drip feed of additional capital. Unless that was provided by the EU, the consequences would be serious for Ireland. In addition, some of the other potential assets that might be used to reduce debt, such as Irish Water, could prove difficult to realise in weak economic conditions. All of these factors render the *Stagnation* scenario an unstable equilibrium; any major shock to the economy could have very serious consequences.

5.5   Implications for Fiscal Policy

The difficulty for policymakers is that the uncertainty about the future path of the economy also makes for considerable uncertainty about the optimal path for future fiscal policy. As shown in Figure 5.27, in the three scenarios examined here the General Government Deficit to GDP ratio is constrained to follow broadly similar paths through assuming rather different fiscal policy stances. In the case of the *Delayed Adjustment* scenario the deficit follows an identical path to that in the *Recovery* scenario. However, this implies a much more stringent fiscal policy stance in the *Delayed Adjustment* scenario. These paths for the deficit potentially lead to a possible exit from crisis. The *Stagnation* scenario would still be on the

border lines of being sustainable in 2020. However, as discussed earlier, there is no certainty as to which of these scenarios is most likely to be closest to the actual outturn. This poses problems for formulating policy; the policy that will be appropriate for one scenario will not be appropriate for the other scenarios.

FIGURE 5.27   General Government Deficit, excluding banks, % of GDP
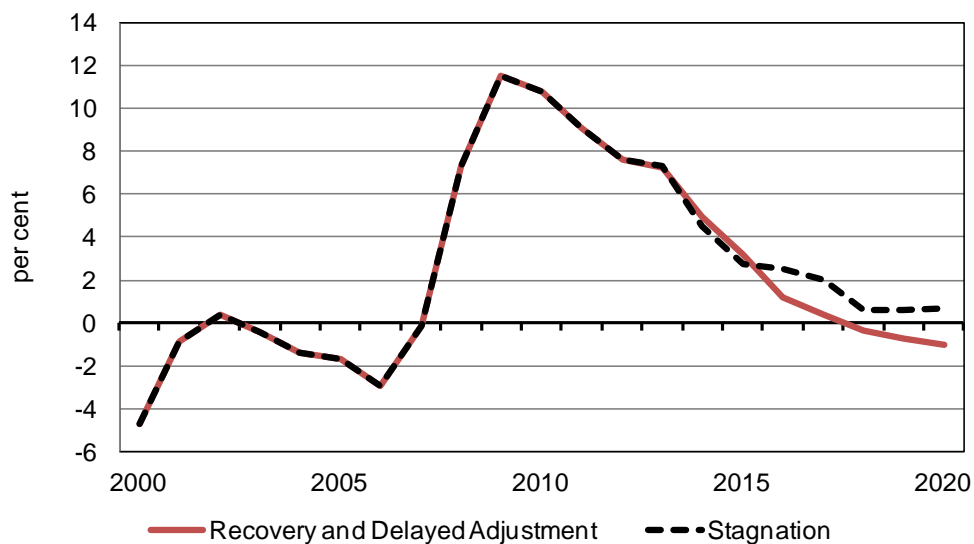
The *Recovery* scenario, if it proves to be close to the actual outturn, would leave the government with more choices. These are illustrated in Figure 5.28, which shows the General Government Deficit under three possible fiscal policy paths. The first path, set out in the *Recovery* scenario, assumes that the €3 billion in planned fiscal adjustment is implemented in the 2014 Budget. It is assumed that the planned adjustment of €2 billion in the 2015 Budget is not implemented but that a less contractionary policy is implemented in 2015-17, followed by a broadly neutral fiscal policy implemented over the rest of the decade. The second path, assuming formal indexation from 2015 onwards, is very similar in character. In both cases the deficit would move into surplus in 2018. This suggests that the structural deficit would effectively be eliminated by the 2014 Budget. The move into surplus would arise from the "cyclical" upturn in the *Recovery* scenario.

The third path considered involves implementing a neutral fiscal policy in 2014 rather than the planned contractionary policy (involving an adjustment of €3 billion). This scenario, where a neutral budget was implemented for 2014, would mean that the deficit would not be eliminated until 2020. This would increase Ireland's vulnerability to shocks. Such shocks, if they were to occur, would require an immediate return to a tough fiscal policy stance.

FIGURE 5.28   General Government Deficit as % of GDP
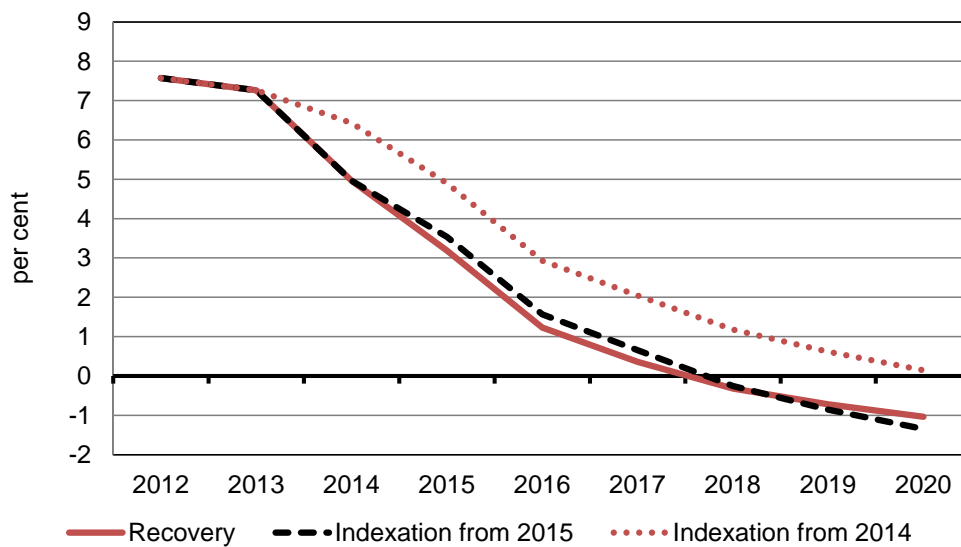
Figure 5.29 shows the *HERMES* model estimate of the risk premium under these three different paths for fiscal policy. Effectively there is no difference between the case of the *Recovery* scenario and the case of the indexation of fiscal policy from 2015. However, the model suggests that a failure to implement the planned fiscal adjustment in 2014 would raise the risk premium on Irish government debt by around 0.4 percentage points by 2020. By 2020 the level of GNP would be very similar under the *Recovery* scenario and the scenario where fiscal policy was indexed from 2014. However, the interest rate and the burden of debt (Figure 5.30) would both be significantly higher in 2020 under the indexation scenario. Thus a failure to make the 2014 budgetary adjustment as planned buys little in the way of higher activity and employment in the medium term but it would result in higher debt and a more vulnerable economy in the long term.

FIGURE 5.29   Interest Rate, 10 year government, per cent
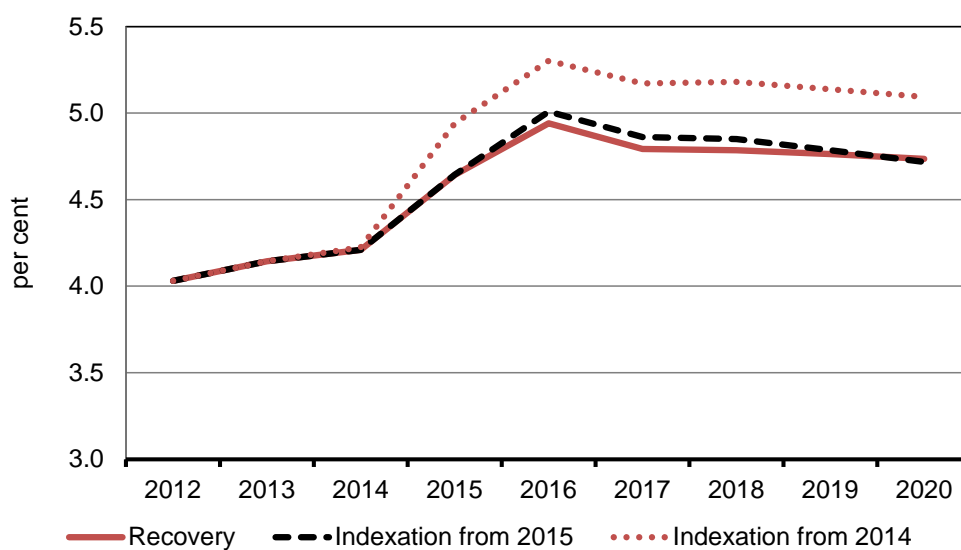
FIGURE 5.30   General Government Debt (Gross) as percentage of GNP
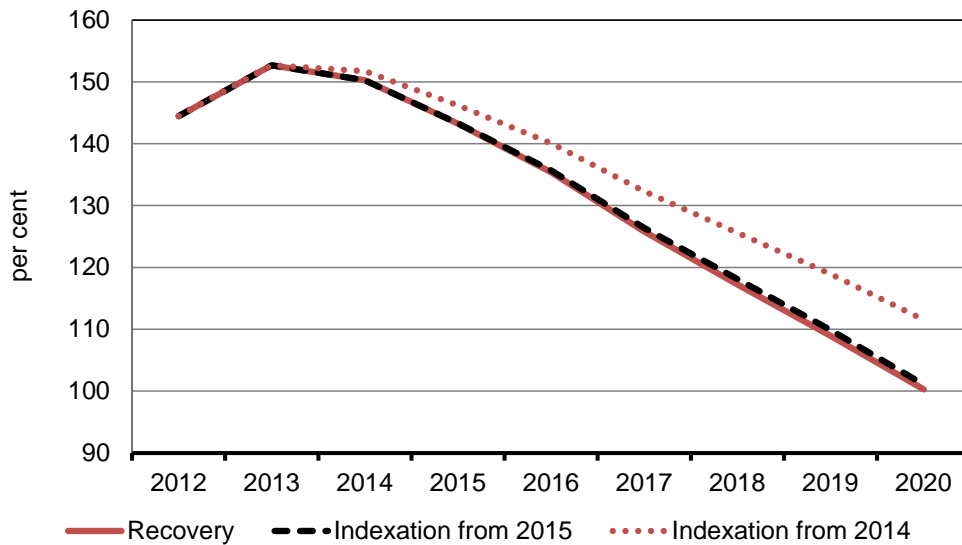
It would still theoretically be possible to avoid making the planned cuts in 2014 and then to make a slightly bigger adjustment in 2015 or 2016. However, having to return to tough Budgets again in 2015 or 2016, after one or two years of neutral fiscal policy, would be very difficult. It would also be likely to damage confidence in the private sector, with other possible knock on effects.

If the economy proves to be on a path close to the *Stagnation* scenario or the *Delayed Adjustment* scenario, then the planned adjustment in 2014 would be the minimum needed for sustainability. In addition, the budgetary adjustment for 2015 would need to be at least the €2 billion currently envisaged by the government.

In the light of this analysis, the best course of action would be to implement the planned €3 billion adjustment in the 2014 Budget. Then, if the EU economy shows signs of returning to growth before the middle of 2015 and if the problems with the domestic financial system are clearly being resolved, there would be a reasonable prospect of the *Recovery* scenario being achieved. Under these circumstances it would be appropriate to implement a neutral fiscal policy in 2015. However, if the EU economy has not begun to recover by mid-2015 or if the financial system's problems are still persisting, it would instead be appropriate to implement the €2 billion adjustment currently envisaged for that year.

Whatever the outcome in the EU economy, there is a real possibility that domestic policy errors could lead to a worse outcome under either scenario. This possibility is discussed further in the next chapter.

5.6 Conclusions

In this chapter we have set out three very different scenarios for the Irish economy. In the *Recovery* scenario GNP per head would return to its 2007 peak by 2017. However, in the case of the *Stagnation* scenario it would be near the end of the next decade before the previous peak level of GNP would be achieved. (The path of the *Delayed Adjustment* scenario would lie between that of the *Recovery a*nd that of the *Stagnation* scenarios.) The path of GNP under the two extreme scenarios is illustrated in Figure 5.31.

FIGURE 5.31   GNP and Trend GNP
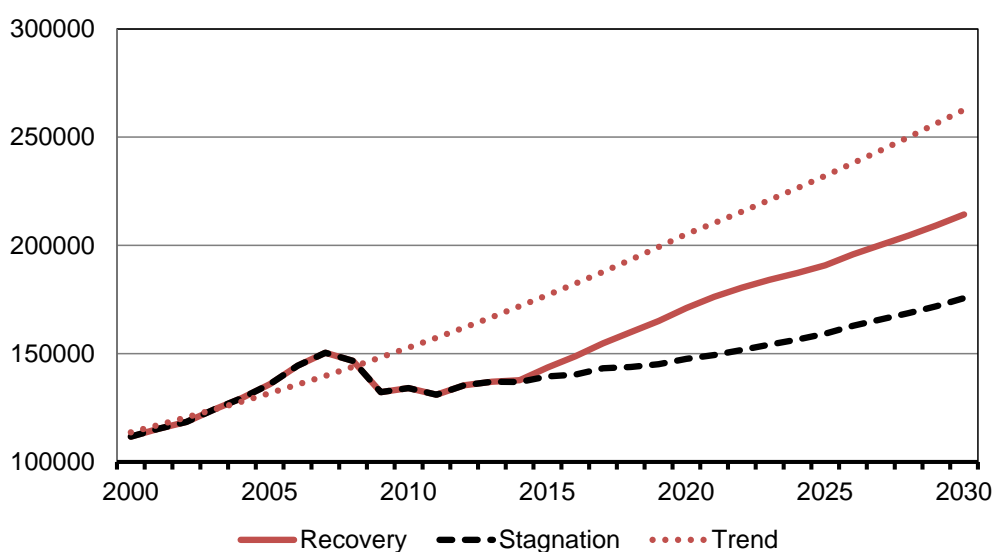
Figure 5.31 also includes the "trend "growth in output. This is taken to be the average growth rate between 1985 and 2005 (3 per cent). After 2020 it is assumed to be 2.5 per cent. In this case trend output is calibrated to be equal to actual output in 2003.[41] This crude measure suggests a huge loss of output as a result of the crisis. This loss would be measured by the difference between the line showing trend output and the lines showing GNP under the other scenarios.

The three scenarios discussed in this chapter would see Ireland moving towards sustainability in terms of its ability to service its debts. However, in the case of the *Stagnation* scenario it could be a close run thing. In the case of the *Recovery* scenario the current problem of indebtedness could be dramatically reduced by 2020 if appropriate domestic policies were pursued.

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[41]   As discussed earlier, 2003 was the year when the current account changed from a surplus to a deficit and it was also the year when actual wage rates were equal to the *HERMES* model estimate of long-run wage rates. Thus it is a suitable year to take when the economy was not too far from a long-term equilibrium.

Any major shock in the *Stagnation* scenario could throw the economy off course in a way that would see the debt burden start to rise again. In particular, if the financial sector required major additional finance from the Irish government over the course of the decade (e.g., to meet Basel III regulations) and if there were some other shock, this could push the economy onto a path towards financial collapse. Related to this, the reaction of the financial markets to a "shock" could also easily destabilise this situation. The modelling of the risk premium under more "normal" circumstances would be likely to be inappropriate for extreme conditions. A situation, that initially looked sustainable, could suddenly prove to be unsustainable because of a shock resulting in a major jump in interest rates.

In the case of the *Stagnation* scenario the first priority for policy would be to address the failure of the Eurozone economy. This would not be something an Irish government could do on its own but would rather be an essential task for Europe as a whole. While particularly unpleasant for Ireland, this scenario would also see huge losses of potential output and a major waste of resources from unemployment across the whole EU.

Domestically, the first priority would be to ensure that commitments from the EU on recapitalising banks are crystallised so that any future funding needs of Irish banks would be met from the EU ESM. This would minimise the risk to Ireland from future "shocks" in the financial sector. In the case of domestic fiscal policy, it would probably be essential to undertake a substantial further fiscal adjustment after 2014. The necessary adjustment would be greater than that envisaged today for 2015.

In the case of the *Recovery* scenario the 2014 Budget would probably be the last really restrictive Budget. It would still be essential to go through with the full planned set of cuts and revenue increases. However, if implemented, it would probably allow for an easing in the fiscal stance from 2015 onwards, avoiding the need for the further planned cuts in the 2015 Budget. With a recovery in Europe and reasonable growth in Ireland the public finances would significantly improve. By 2020 the debt burden would be substantially reduced and very clearly sustainable. In addition, if properly managed, the state's financial assets could be used to reduce the debt burden by a further significant amount.

Under this scenario the labour market would also show significant improvement. The move back towards full employment (though still some distance away in 2020), would be facilitated by the fact that such a trajectory for the economy would involve quite a rapid growth in investment, including investment in housing. Whether this growth in employment would be fully translated into the

envisaged reduction in unemployment would depend on the labour market policies deployed over the next few years. There must remain a considerable danger of hysteresis in the labour market as a result of the current high level of long-term unemployment.

In the *Recovery* scenario it is assumed that the government manages to deal with the current problems in the banks in an effective and speedy manner. The government as the major shareholder in the banks must ensure that it maximises its return from the banks through ensuring that, wherever possible, all debt outstanding is repaid. A failure to maximise the return to the banks on their loans could see a very serious further loss of money by the state. While the banks have been given a huge amount of capital by the government they hold it in trust for the people of Ireland who are major shareholders in the banks. Every billion euro of capital not recovered by the banks for the shareholder is a billion euro that will have to be raised in future taxes.

In addition to the danger of frittering away the government's financial assets in the banks, a second danger lies in the fact that the recovery of the economy will only take place if the necessary finance is available to fund investment. While there may not be that much demand for funding today (O'Toole, Gerlach-Kristen and O'Connell, 2013) the volume of future investment under this *Recovery* scenario will require a major increase in financial resources over the rest of the decade. The *Delayed Adjustment* scenario illustrates the possible macro-economic consequences of a failure to address the continuing problems in the financial sector.

While the *Delayed Adjustment* scenario has concentrated on the need to tackle the problems of the financial sector, Chapter 3 discussed a range of other factors that could lead to a serious underperformance by the Irish economy over the rest of the decade. Some of these risks are amenable to domestic policy action in the short term. However, the risks to the tradable sector, which might render the current Irish industrial model increasingly obsolete at some date in the future, can only be addressed by policy over a long time horizon. The vulnerability of the economy to policy changes externally that might affect the corporate tax regime cannot be countered quickly. Instead a shift in industrial policy is needed to diversify the tradable sector away from dependence on individual sectors or a specific tax regime.

Finally, it is not clear today which of the different paths, traced out in this chapter, will be followed by the economy over the coming decade. Under these circumstances it is important to try and choose a "no regrets" policy stance that

will be robust whatever the outcome. In the light of this analysis the key elements of such a response are that:

- EU policy, including EU fiscal policy, needs to be supportive of a return to growth. With some countries, such as France, missing fiscal targets because of low growth, the appropriate fiscal response is to allow automatic stabilisers to take effect. This policy has been agreed for France in the late spring of 2013. If implemented earlier across the EU, such a response would already have resulted in higher growth this year.

- The 2014 Budget should be implemented as planned; if the economy proves to be following the *Recovery* scenario then further fiscal adjustment should not be necessary. If it is following the *Stagnation* scenario then that Budget would also prove to have been appropriate.

- It is essential to ensure that the continuing problems in the financial sector are tackled rapidly so that they do not derail any recovery in the economy.

- It is very important to implement labour market policies today which would facilitate the orderly reduction in unemployment in the event that the *Recovery* scenario proves close to the actual outturn.

Chapter 6

Exploring the Response of the Economy to Shocks and Surprises

Because of the uncertainty about the future path of the economy it is useful to explore the possible effects on the future growth path of changes in a selection of key variables. This exploration can help us gain a better understanding of what drives the economy in the medium term and what are the important factors that will affect the actual outturn.

In this chapter we use the most recent version of the *HERMES* model to examine the medium-term behaviour of the Irish economy. A description of the model is available in a separate Working Paper (Bergin *et al.,* 2013).

By changing the values of key variables in the model we can trace how these changes percolate through the economy. This in turn throws light on how the economy is likely to behave in the face of changes in key driving variables, such as world growth, and important policy variables, such as taxes and public expenditure.

6.1   Methodology Adopted

In this chapter the baseline used for the shocks is the *Recovery* scenario presented in Chapter 5. Experience has shown that the results obtained are relatively invariant with respect to the precise base used.[42]

To consider the impact on the economy of changes in chosen variables, the relevant aggregates are changed one at a time by a fixed amount, for example by 1 per cent of GDP or €1 billion. In the case of variables that are endogenous in the model (e.g. house prices and wage rates) they are first exogenised at the value which they take on in the benchmark run before they are perturbed. Then the model is simulated with this one change, holding all other exogenous variables unchanged at their baseline levels. The resulting simulation results are then

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[42]   An alternative approach to developing a benchmark, which is sometimes adopted, is to forecast forward all exogenous variables (including time) unchanged to generate the base. Then the changes are superimposed on this artificial base. While this approach has the advantage that the results are not affected by changing levels of key variables in the base, it raises difficulties as to how to handle inflation rates and rates of return, including interest rates. Generally, in such cases interest rates and rates of return should be held fixed in real terms. Because of these problems we favour the benchmark approach – superimposing shocks to the model on a baseline forecast. In that regard, past experience in using the model indicates that the results of shocks or perturbations are relatively invariant to changes in the benchmark.

compared to the baseline thereby isolating the effect of a change in the relevant variable.

In carrying out these simulations all exogenous variables and parameters, other than those being perturbed, are held at benchmark levels. Of course, in the real world many exogenous variables change continuously. For example, when examining the effects of a particular government budget package many different exogenous variables may change and some crucial parameters may also be affected, such as through the effect of fiscal policy on consumer confidence. As a result, when using the model to examine real life policy changes or exogenous shocks to the Irish economy, it is necessary to carry out a full simulation, considering the effects of the policy change (or shocks) on all the exogenous variables and parameters in the model.

Finally there are two technical considerations which are important when interpreting the results:

1. Unless otherwise specified, it is assumed that the government borrowing requirement will change as a result of the perturbation in the model. For example, where a tax rate is increased it is assumed that the additional revenue is used to reduce borrowing rather than to reduce other taxes. Instead all key government expenditure or revenue items, other than the one being changed, are held constant in real terms according a set of indexation rules described in Bergin *et al.* (2013).

2. The risk premium on government debt is endogenous in the latest version of the model. This means that changes in the debt/GDP ratio can impact on this risk premium. However, in implementing the shocks presented here we assume that the risk premium is exogenous. This makes it easier to identify the effects of the changes coming through the other channels in the model. (It also facilitates comparisons with results from previous versions of the model in Bergin *et al.,* 2009a and Conefrey *et al.*, 2012.)

The results for each of the different shocks are presented for a standard set of variables in a series of tables.[43] In each case the results are presented as changes compared to the benchmark, e.g., the change in GNP resulting from the shock. Unless otherwise specified, each shock is initiated in 2013 and the results are then examined for the period to 2018, holding the shock unchanged over that period. Generally, the discussion centres on the medium-term impact of the different shocks, concentrating on the results for 2018. However, each of the tables shows the impact effects for 2013 and the results for the intervening years.

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[43]   The effects on all the other variables in the model are available, on request, from the authors.

For a shock implemented in 2013, the first full year impact is in 2014, given lags in the model.

The variables for the current account and the General Government Balance are both defined as being positive when there is a surplus. Hence, in interpreting the results, it should be noted that a positive sign denotes a reduction in the current account deficit (or, equivalently, an increase in the surplus) and a reduction in the government borrowing requirement (or, equivalently, an increase in the financial surplus).

6.2   Summary of Shocks

Table 6.1 summarises the medium-term results of the shocks reported on in detail in this chapter. It gives an opportunity to compare the results from shocks of a similar character – e.g. the public finance shocks. The detailed results are then presented separately for each shock.

TABLE 6.1:   Change in GDP, Unemployment Rate and Deficit 6 years after Initial Shock

	GDP		Unemployment Rate	Deficit as % of GDP
	The shock	% change	Absolute change	
Key Behavioural Variables				
World growth	+1%	1.1	-0.4	-0.3
International competitiveness				
- foreign prices	+1 %	0.8	-0.1	-0.2
- domestic wage rates	+1 %	-0.1	0.5	0.1
Domestic interest rates	+1 pp	-0.5	0.2	0.4
House Prices	-10%	-0.2	0.3	0.4
Key Policy Variables:				
Income tax	+€1bn	-0.3	0.2	-0.5
Current expenditure				
- Public service wage	-€1bn	-0.2	-0.3	-0.4
- Public service employment	-€1bn	-0.7	0.6	-0.2
- Current transfer Payments	-€1bn	-0.2	0.1	-0.4
Capital expenditure	-€1bn	-0.2	0.2	-0.4

In relation to the key behavioural variables, the results suggest that a positive external shock to the economy, whether through an increase in world growth or an increase in competitors' prices, has a significant effect on GDP over the medium-term. By contrast, an improvement in competitiveness through a reduction in domestic wages, an internal devaluation, has a much lower effect on GDP. In relation to public policy variables, for the same initial ex ante saving of €1

billion, the results suggest that cuts in public service employment have the biggest negative effect on GDP over the medium term, while cuts in public service wages or transfer payments have a much less severe impact on GDP over the medium-term. In relation to the deficit, a €1 billion increase in income tax has the strongest effect in reducing the deficit over the medium-term.

6.3 Results for Key Variables

World growth

The sensitivity of the Irish economy to developments in the rest of the world is illustrated clearly by the stark differences between the performance of the economy in the *Recovery* and the *Stagnation* scenarios. In the *Recovery* scenario, the Irish economy benefits from an assumed pick-up in international trade and returns to reasonable growth by the middle of this decade. In contrast, the absence of growth in Ireland's key trading partners in the *Stagnation* scenario results in a prolonged period of stuttering growth and high unemployment. Given this dependence on external demand, one of the most important sources of uncertainty with regard to projections for the Irish economy relates to the prospects for the world economy.

FIGURE 6.1   Value added, industry and services, % change compared to base
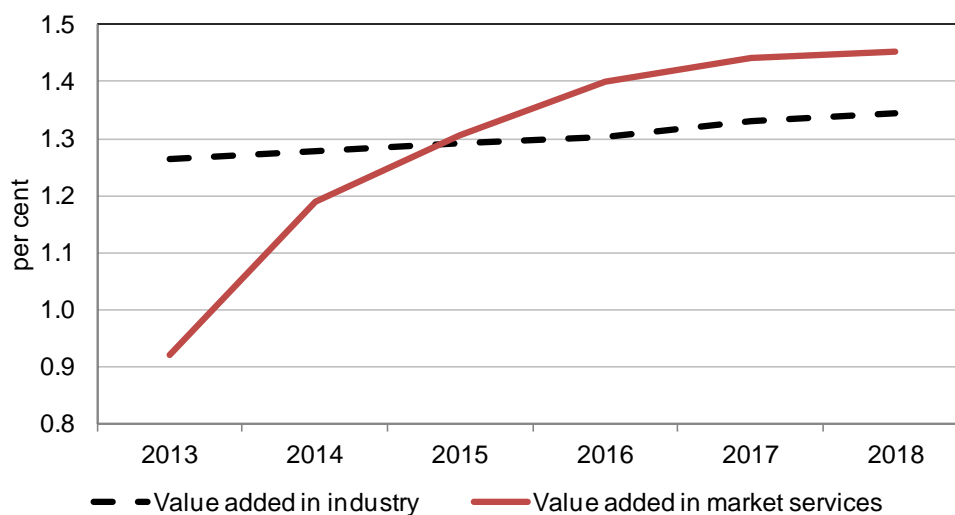
In this shock we simulate the effects of an increase in world output of one percentage point from 2013. This shock illustrates how a recovery in world output would impact on the Irish economy. The results of this shock are presented in Table 6.2 which shows the deviations of variables from their benchmark values. The shock to world output would increase the volume of output in the industrial and market services sectors in Ireland. With the bulk of output in the manufacturing sector being destined for export, the increase in

world demand would have a large effect on output in that sector which would rise by around 1.3 per cent over the medium term (Figure 6.1).[44] With a growing share of services sector output now exported, the impact of the shock on the output of the market services sector would be similar to that for manufacturing at +1.5 per cent. This represents a change in the behaviour of the economy compared to previous results (Bergin *et al.*, 2009a) when a shock to world demand was transmitted to the Irish economy primarily through its impact on the manufacturing sector.

TABLE 6.2   World growth shock, change from baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	0.8	0.9	1.0	1.1	1.1	1.1
GNP	%Δ	0.5	0.7	0.8	0.9	1.0	1.0
Value added in industry	%Δ	1.3	1.3	1.3	1.3	1.3	1.3
Value added in market services	%Δ	0.9	1.2	1.3	1.4	1.4	1.5
Consumption	%Δ	-0.1	0.2	0.3	0.5	0.6	0.6
Investment	%Δ	1.1	1.6	1.4	1.3	1.3	1.3
Exports of Goods and Services	%Δ	3.2	3.4	3.5	3.6	3.7	3.8
Consumption deflator	%Δ	0.0	0.1	0.1	0.1	0.1	0.1
Wages (non-agricultural)	%Δ	0.0	0.3	0.4	0.5	0.6	0.7
Total employment	%Δ	0.3	0.4	0.5	0.6	0.6	0.6
Employment in services sector	%Δ	0.2	0.4	0.4	0.5	0.5	0.5
Balances							
Unemployment Rate (ILO)	Δ	-0.2	-0.4	-0.4	-0.4	-0.4	-0.4
Current account of BOP as % of GDP	Δ	0.1	0.2	0.2	0.2	0.2	0.3
General Government Deficit as % of GDP	Δ	-0.1	-0.2	-0.2	-0.3	-0.3	-0.3
General Government Debt as % of GDP	Δ	-0.9	-1.3	-1.6	-2.0	-2.2	-2.4
Welfare							
GDP per capita	%Δ	0.8	0.9	0.9	1.0	1.0	1.0
Consumption per capita	%Δ	-0.1	0.2	0.3	0.5	0.5	0.5
Net Emigration	Δ	0.0	-0.7	-1.5	-1.2	-1.1	-0.8
The shock							
Foreign Demand *		1%	1%	1%	1%	1%	1%

* GDP in UK, USA, EU and OECD.

The overall increase in employment arising from the shock to world output would be less than the increase in output. Total employment would be increased by 0.6 per cent in 2018 compared to the base while the unemployment rate would fall by 0.4 percentage points. As a result of the tightening in the labour market, wage rates would end up around 0.7 per cent higher than in the base. This would have some offsetting effect on Irish output and employment, through reducing Irish

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[44]   The industrial sector includes both manufacturing and building and construction.

competitiveness. However, if a similar rise took place in prices and wages outside Ireland this negative offset would not occur.[45]

It is assumed that there is no change in fiscal policy other than through indexation. The increase in output and employment in the economy would increase government revenue from a range of taxes while the fall in the unemployment rate would reduce government welfare payments. The net effect on the public finances would be a substantial reduction in the government borrowing requirement as a percentage of GDP of 0.3 percentage points by 2018.

There would also be a positive impact on the current account (a 0.3 percentage points reduction in the deficit or increase in the surplus) as a result of the foreign stimulus. While such an improvement in the current account could endure for quite a number of years, in the long term it would result in higher domestic consumption. If this long-term wealth effect on consumption were taken into account, so that the current account of the balance of payments was unchanged, then the positive impact on growth and the public finances would be enhanced.

Consumer prices would increase by 0.1 per cent as a result of higher wage rates in the economy. This would act as only a partial offset to the rise in wage rates, so that real personal disposable income would be substantially increased. This would sustain an increase in consumption of 0.6 per cent compared to the base in 2018.

Overall, GDP in Ireland would be increased by 1.1 per cent in 2018 as a result of this shock to world output.

International Competitiveness I: Foreign Prices

In this exercise we simulate an improvement in Irish competitiveness by increasing wage rates and prices in Ireland's main competitor economies, including the US, the UK and the EU, by 1 percentage point compared to the benchmark. This can be seen as replicating a change in the external value of the currency. Changing external prices affects the economy in two ways. First, as a result of the rise in foreign prices the output price of manufacturing firms in Ireland would also increase as they are price takers on the world market. This would increase their profitability by more than a similar reduction in Irish wage rates. Second, it would affect the relative returns to working in Ireland and abroad and, hence, it would affect labour supply through migration.

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[45] Under normal conditions a positive shock to word output would see some increase in wage rates in our competitors.

TABLE 6.3 International competitiveness, foreign prices shock, change from baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	0.5	0.6	0.7	0.8	0.8	0.8
GNP	%Δ	0.0	0.2	0.3	0.4	0.5	0.5
Value added in industry	%Δ	1.6	1.7	1.7	1.8	1.8	1.7
Value added in market services	%Δ	0.1	0.3	0.4	0.5	0.5	0.5
Consumption	%Δ	0.0	0.2	0.3	0.5	0.6	0.6
Investment	%Δ	0.4	0.6	0.8	0.8	0.7	0.7
Exports of Goods and Services	%Δ	0.0	0.3	0.4	0.4	0.4	0.4
Consumption deflator	%Δ	0.2	0.2	0.3	0.3	0.3	0.3
Wages (non-agricultural)	%Δ	0.0	0.2	0.4	0.5	0.6	0.6
Total employment	%Δ	0.1	0.2	0.2	0.2	0.2	0.2
Employment in services sector	%Δ	0.1	0.2	0.2	0.2	0.2	0.2
Balances							
Unemployment Rate (ILO)	Δ	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1
Current account of BOP as % of GDP	Δ	0.2	0.3	0.4	0.4	0.4	0.5
General Government Deficit as % of GDP	Δ	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2
General Government Debt as % of GDP	Δ	-1.5	-1.9	-2.1	-2.4	-2.5	-2.6
Welfare							
GDP per capita	%Δ	0.5	0.6	0.7	0.8	0.8	0.8
Consumption per capita	%Δ	0.0	0.2	0.3	0.5	0.5	0.5
Net Emigration	Δ	0.0	0.1	-0.4	-0.7	-0.7	-0.5
The shock							
Foreign Prices *		1%	1%	1%	1%	1%	1%

* Output prices in Germany, UK, EU and USA; consumption prices in Germany and UK; wage rates in UK.

It is chiefly through the output of the industrial and market services sectors that the improvement in competitiveness would affect the Irish economy. As shown in this simulation (Table 6.3), in the medium term (2018) industrial output would increase by 1.7 per cent when faced with a one percentage point improvement in competitiveness. The market services sector would still produce the majority of its output for the domestic market and it would, thus, show less responsiveness to an improvement in Irish competitiveness. Net output (GDP arising) in services would increase by 0.5 per cent in 2018 as a result of the shock.

The increase in output in both industry and services would feed through to an increase in total employment of 0.2 per cent and a reduction in the unemployment rate of 0.1 percentage points in 2018. As a result of this improvement in labour market conditions, Irish wage rates would be around 0.6 per cent above base by 2018.

Higher levels of output and employment would increase government revenue from taxation with the result that the government borrowing requirement as a percentage of GDP would fall by 0.2 percentage points. Overall, GNP would increase by 0.5 per cent in volume terms by 2018 while GDP would be up by around 0.8 per cent (Figure 6.2). Higher exports would lead to a significant improvement in the current account of the balance of payments of close to 0.5 percentage points, while consumer prices would increase slightly by 0.3 per cent.

FIGURE 6.2   GDP and GNP compared to base, % change
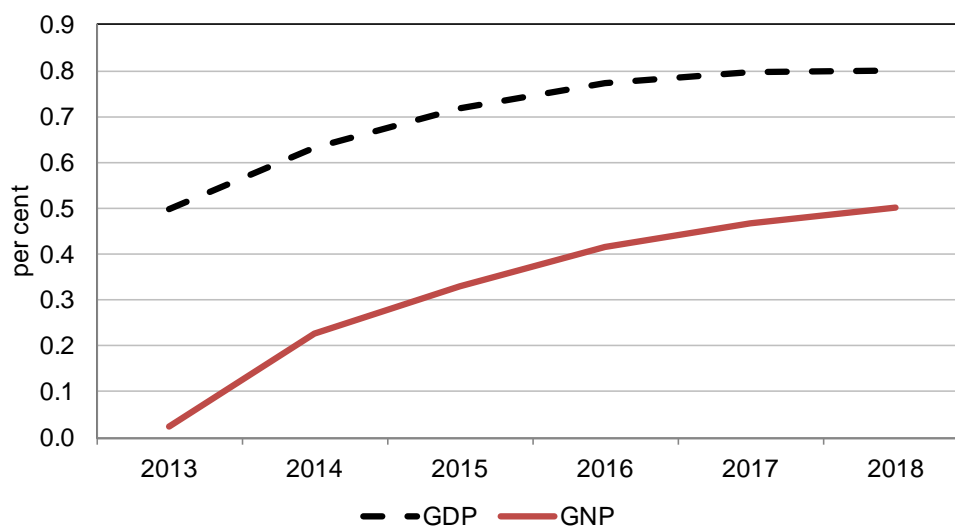
International Competitiveness II: Domestic Wage Shock

In the years preceding the current crisis there was extensive evidence that Ireland was losing competitiveness on world markets. Labour costs had risen continuously relative to Ireland's neighbours and the current account began to move into deficit after 2003. As a result of strong domestic demand and the building boom, the damage caused by the economy's loss of competitiveness was largely masked. However, once the building bubble burst the cumulative effects of the deterioration in competitiveness became clear and left the economy particularly exposed to the world recession which hit in 2008.

With the exception of the public service, wage rates are not a policy variable that the government can control or vary. On past experience, wage bargaining in the Irish labour market takes place in terms of real after tax wages and wage rates adjust over two or three years to their equilibrium value (Curtis and FitzGerald, 1996 and FitzGerald, 1999). With a very low background rate of inflation in recent years (in Ireland prices actually fell) to achieve a fall in real wage rates there would also have to be a fall in nominal wage rates.

While on the basis of the past behaviour of the labour market, periods of high unemployment have resulted in reductions in real wage rates through under-indexation to prices, there has been little evidence over recent years of widespread reductions in nominal wages, particularly in the private sector (Walsh, 2011; Bergin, Kelly and McGuinness, 2012). There is also very limited experience in other OECD countries of this happening in the post-war years.

As a result, there is considerable uncertainty as to how the adjustment in the labour market will operate in the current circumstances. It could be argued that a delay in adjustment in wage rates would shift the burden of adjustment onto employment leading to higher unemployment. In addition, given Ireland's membership of EMU, the importance of improving competitiveness through internal devaluation is heightened.

In this simulation we consider the impact of an increase in the level of non-agricultural wage rates in 2013 of 1 per cent relative to the base, with this increase in the level of wage rates of 1 per cent relative to the base being maintained for the full period to 2018.

The potential impact of this increase in wage rates on a range of key variables is shown in Table 6.4. The economy would take time to adjust to such a sudden change. It would take time for the rise in wage rates to feed through into the prices of domestic inputs and, hence, Irish and foreign firms would be slow to react to the change. The full implications for investment in new capital equipment would also only materialise with a lag. As a result, the long-term effects are best considered by concentrating on the results for 2015-2018.

The rise in wage rates would have a negative impact on economic activity, employment and the public finances in the medium term. The simulation indicates that the deterioration in competitiveness brought about by the wage increase would reduce GDP by around 0.1 per cent by 2018 while GNP would fall by a similar amount. As indicated above, the initial impact would be small as it would take time for the economy to adjust.

The damage to Ireland's competitiveness would result in lower output in manufacturing and market services. GDP arising in industry would fall by around 0.4 per cent as a result of the wage shock.

TABLE 6.4   International Competitiveness, Domestic Wage Shock, Change from Baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	0.0	0.0	0.0	-0.1	-0.1	-0.1
GNP	%Δ	0.0	0.1	0.1	0.0	0.0	-0.1
Value added in industry	%Δ	-0.3	-0.3	-0.3	-0.3	-0.3	-0.4
Value added in market services	%Δ	0.0	0.0	0.0	0.0	0.0	-0.1
Consumption	%Δ	0.3	0.4	0.4	0.4	0.3	0.2
Investment	%Δ	-0.1	0.1	0.2	0.2	0.0	-0.1
Exports of Goods and Services	%Δ	0.0	-0.1	-0.2	-0.3	-0.3	-0.4
Consumption deflator	%Δ	0.2	0.2	0.2	0.2	0.2	0.2
Wages (non-agricultural)	%Δ	1.0	1.0	1.0	1.0	1.0	1.0
Total employment	%Δ	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3
Employment in services sector	%Δ	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2
Balances							
Unemployment Rate (ILO)	Δ	0.2	0.3	0.3	0.4	0.4	0.5
Current account of BOP as % of GDP	Δ	0.0	-0.1	-0.1	-0.1	-0.1	0.0
General Government Deficit as % of GDP	Δ	0.0	0.0	0.0	0.0	0.1	0.1
General Government Debt as % of GDP	Δ	-0.3	-0.3	-0.3	-0.2	0.0	0.1
Welfare							
GDP per capita	%Δ	0.0	-0.1	-0.1	-0.1	-0.2	-0.2
Consumption per capita	%Δ	0.3	0.3	0.4	0.3	0.2	0.2
Net Emigration	Δ	0.0	-1.5	-0.7	-0.3	0.0	0.2
The shock							
Non Agricultural Wages		1%	1%	1%	1%	1%	1%

In turn, the reduction in output would give rise to a fall in employment. Total employment would be down by 0.3 per cent by 2018. The effect on labour supply would be quite uncertain because of the unusual external environment – a recession in many other labour markets. The model assumes that the higher unemployment rate would partly offset the increase in real after tax wage rates in Ireland, moderating the impact on migration.

The rise in the unemployment rate of around 0.5 percentage points by 2018 would increase government welfare payments. The economy-wide increase in wage rates would also increase the cost of the public service pay bill, as public service wage rates are assumed to adjust in line with wage rates in the private sector.[46] On the revenue side, while initially higher incomes would increase income tax receipts, this would be offset by lower employment and business activity. The government borrowing requirement as a percentage of GDP would rise by around 0.1 percentage point by 2018. If the government were to react to

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[46]   If, government expenditure on pay was held constant, with services and numbers employed being cut instead, the negative impact on GNP and employment would be magnified.

hold the general government deficit unchanged, the negative impact on GNP and employment would be magnified.

Finally, the increase in wage rates would result in higher consumer prices of around 0.2 per cent.

Interest Rates

The years leading up to the crisis saw a significant increase in private sector indebtedness as households and companies borrowed heavily to fund investment in building and construction. The collapse of the property bubble coincided with a rapid increase in government indebtedness as the large gap which opened up between government spending and revenue was exacerbated by the need for state funded recapitalisation of the Irish banks. The elevated level of private sector indebtedness, as well as the size of the national debt, makes the economy particularly vulnerable to changes in interest rates.

In this simulation we examine the impact of a 1 per cent increase in domestic interest rates. The shock is implemented by increasing the rate of interest on government bonds which, in turn, determines all domestic interest rates in the model. There are several channels through which the shock to interest rates is transmitted to the Irish economy. In the manufacturing sector, a rise in interest rates would result in an increase in the cost of capital, leading to a shift away from domestic value added as firms increase their imports at the expense of domestic production. The shift away from domestic value added would be influenced by the relative profitability of production in Ireland versus the rest of the world. The volume of value added arising in the industrial sector would decline by 1.8 per cent in the long run (Table 6.5).

The increase in the cost of capital would lead to a reduction in the optimal capital stock in the manufacturing sector. As the actual capital stock adjusts to this lower optimal stock, investment would fall relative to the baseline. As a result, the rise in the cost of capital following the interest rate shock would lead directly to a reduction in investment by firms in the manufacturing sector. Overall, investment would decline by around 1.5 per cent after four years, falling to 0.9 per cent after six years.

TABLE 6.5   Interest Rate Shock, Change from Baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	0.0	-0.2	-0.4	-0.5	-0.5	-0.5
GNP	%Δ	0.0	-0.3	-0.4	-0.4	-0.4	-0.3
Value added in industry	%Δ	-0.1	-0.4	-0.9	-1.3	-1.6	-1.8
Value added in market services	%Δ	0.0	-0.1	-0.2	-0.2	-0.1	0.0
Consumption	%Δ	0.0	-0.3	-0.3	-0.4	-0.1	0.2
Investment	%Δ	-0.1	-0.8	-1.5	-1.5	-1.2	-0.9
Exports of Goods and Services	%Δ	0.0	-0.1	-0.2	-0.2	-0.3	-0.2
Consumption deflator	%Δ	0.0	0.0	0.0	0.0	-0.1	-0.1
Wages (non-agricultural)	%Δ	0.0	0.0	-0.1	-0.2	-0.3	-0.4
Total employment	%Δ	0.0	-0.1	-0.2	-0.3	-0.3	-0.3
Employment in services sector	%Δ	0.0	0.0	-0.1	-0.1	0.0	0.0
Balances							
Unemployment Rate (ILO)	Δ	0.0	0.1	0.2	0.3	0.2	0.2
Current account of BOP as % of GDP	Δ	0.0	0.0	0.1	0.1	-0.1	-0.2
General Government Deficit as % of GDP	Δ	0.0	0.3	0.4	0.4	0.5	0.4
General Government Debt as % of GDP	Δ	0.0	0.5	1.1	1.7	2.1	2.4
Welfare							
GDP per capita	%Δ	0.0	-0.2	-0.4	-0.5	-0.5	-0.5
Consumption per capita	%Δ	0.0	-0.3	-0.3	-0.3	0.0	0.3
Net Emigration	Δ	0.0	0.0	0.1	0.7	0.8	0.6
The shock							
Interest Rate*		1	1	1	1	1	1

There are several important caveats to note when interpreting the results of the interest rate simulation. In the current specification of *HERMES*, an increase in interest rates does not affect the cost of capital for the services sector; hence, the results described here do not capture all of the likely effects of a rise in interest rates on the economy. The simulation assumes that foreign-owned multinationals in the manufacturing sector are affected by the rise in domestic interest rates. Given these firms' access to other sources of finance outside Ireland, this assumption overstates the impact of the shock on manufacturing output.

For households, the higher interest rate would make borrowing to fund investment in dwellings more expensive. Housing completions would fall by around 1.4 per cent and house prices would be reduced by over 2 per cent after five years. The decline in house prices, affecting housing wealth, would contribute to a fall in consumption of around 0.4 per cent after four years. There would also be a negative impact on mortgage arrears (Kelly and McQuinn, 2013).

Lower output, investment and consumption would lead to a deterioration in labour market conditions. Overall employment would fall by 0.3 per cent, mostly as a result of lower manufacturing employment, giving rise to an increase in the unemployment rate of around 0.2 per cent.

Lower output and profitability in the manufacturing sector would reduce government revenue from taxation while government spending would increase to fund the rise in unemployment transfers. The increase in the cost of borrowing would also result in higher government debt interest payments abroad. As a consequence, the government borrowing requirement would rise by around €950 million or close to 0.4 per cent of GDP by the end of the period.

House Prices

Reinhart and Rogoff (2009) and Reinhart and Reinhart (2010) identify five systemic crises in advanced economies since World War II, crises which also involved falls in house prices. The countries identified are Sweden, Finland, Norway (1990s Nordic crisis), Japan (1997-2001) and Spain (1977). Since reaching their peak in the third quarter of 2007, Irish house prices have declined by 50 per cent. As shown in Woods and O'Connell (2012), the depth and speed of the decline in Irish house prices has exceeded that recorded during any of these previous five episodes of systemic crisis.

With Irish banks heavily exposed to property-related lending, rapidly falling prices led to a deterioration in banks' asset quality and an escalation in loan losses. At the same time, the collapse in house prices resulted in a severe reduction in Irish households' housing wealth. Lydon and O'Hanlon (2012) show that in 2005 and 2006 at the height of the property bubble, one-third of mortgage drawdowns, accounting for 15 per cent or €5.5 billion of lending per annum, were top-up or equity withdrawal loans. The erosion of housing wealth as a result of the fall in house prices is likely to have contributed directly to the fall in consumption during the crisis, an effect aggravated by the elimination of the housing equity withdrawal channel. Finally, the reduction in house prices coincided with a dramatic decline in housing output and employment. Taken together, this combination of effects indicates the extent to which many of the problems in the Irish banking system, public finances, domestic economy and labour market have their roots in the substantial fall in house prices which occurred between 2008 and 2012.

Given the importance of house price movements to developments in the macro economy, this simulation examines the impact of a 10 per cent fall in house prices from 2013. Consumption is one of the key channels through which the fall in house prices influences the economy. In considering the effect on consumption, it is important to distinguish between the short-run and long-run response. In response to a decline in house prices, which erodes housing wealth, households would initially react by reducing their consumption and increasing their savings. Consumption would fall by close to 1.3 per cent in year one (Table 6.6). The increase in the savings rate would cause households to accumulate a larger stock of financial assets. In the long run the build-up of financial assets would be slowly unwound, which would eventually feed through to stronger consumption. As a result, the initial negative effect on consumption arising from the fall in house prices would gradually dissipate and, as households begin to consume out of accumulated financial wealth, the consumption effect would finally turn positive after around six years (Table 6.6).

TABLE 6.6   House Price Shock, Change from Baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	-0.5	-0.6	-0.6	-0.4	-0.3	-0.2
GNP	%Δ	-0.7	-0.7	-0.6	-0.3	-0.1	0.0
Value added in industry	%Δ	-0.5	-1.1	-1.1	-0.8	-0.7	-0.5
Value added in market services	%Δ	-0.6	-0.5	-0.4	-0.3	-0.2	-0.2
Consumption	%Δ	-1.3	-0.5	-0.4	-0.4	-0.2	0.0
Investment	%Δ	-4.3	-8.1	-7.2	-4.2	-3.4	-3.3
Exports of Goods and Services	%Δ	0.0	0.0	0.0	0.0	0.1	0.1
Consumption deflator	%Δ	0.0	0.0	-0.1	-0.1	-0.1	-0.1
Wages (non-agricultural)	%Δ	0.0	-0.2	-0.3	-0.4	-0.4	-0.4
Total employment	%Δ	-0.5	-0.9	-0.8	-0.6	-0.5	-0.5
Employment in services sector	%Δ	-0.2	-0.2	-0.2	-0.1	-0.1	0.0
Balances							
Unemployment Rate (ILO)	Δ	0.4	0.7	0.7	0.4	0.3	0.3
Current account of BOP as % of GDP	Δ	0.6	0.6	0.6	0.6	0.5	0.5
General Government Deficit as % of GDP	Δ	0.5	0.9	0.8	0.5	0.5	0.4
General Government Debt as % of GDP	Δ	1.3	2.1	2.9	3.2	3.4	3.5
Welfare							
GDP per capita	%Δ	-0.5	-0.6	-0.5	-0.3	-0.2	-0.1
Consumption per capita	%Δ	-1.3	-0.5	-0.3	-0.3	-0.1	0.1
Net Emigration	Δ	0.0	1.0	1.7	1.6	0.7	-0.1
The shock							
House Prices		-10%	-10%	-10%	-10%	-10%	-10%

With a large proportion of the output of the services sector being sold domestically, lower household consumption would reduce services sector output by around 0.6 per cent in the short run and 0.2 per cent in the medium term (Figure 6.3). The fall in house prices would have a significant impact on output and investment in the building and construction sector. Housing completions would decline by between 5 and 6 per cent by the end of the period, which would contribute to a fall in overall industrial output of around 0.5 per cent in the short run. Total investment would be around 3.3 per cent lower by the end of the period.

FIGURE 6.3   Value Added, Industry and Services, Compared to Base, % Change
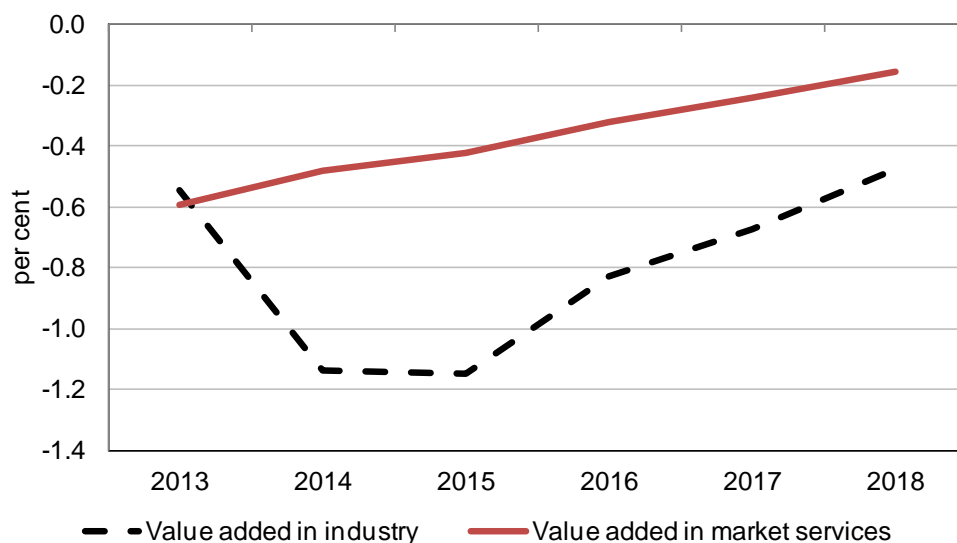
Lower consumption, output and investment would reduce the demand for labour so that total employment would fall by around 0.5 in the long-run and the unemployment rate would increase by 0.3 percentage points. The fall in house prices would have a sizable employment impact, given the labour intensity of the building and construction and services sectors.

The public finances would deteriorate due to a combination of lower taxation receipts from VAT, company taxes and a range of other sources as well as higher current expenditure due to the increase in unemployment. The borrowing requirement would increase by around 0.9 per cent at peak after 2 years but would narrow thereafter as the negative drag from consumption would ease.

The overall impact of this shock to house prices would be to reduce GDP by around 0.2 per cent by 2018 while GNP would be relatively unaffected. In the long run, consumption and services sector output would recover sufficiently to

offset the impact of lower construction output resulting in a small increase in overall GDP after around 10 years.

This simulation does not take account of the impact on banks' balance sheets or on NAMA of the decline in house prices. To the extent that the fall in house prices gave rise to additional bank losses or to losses on NAMA's portfolio, the impact on the public finances could be much more severe than presented in Table 6.6 (Kelly and McQuinn, 2013).

6.4   Standardised €1 billion Fiscal Shocks

Estimates of Fiscal Multipliers

In this section we present the results of implementing a set of standardised fiscal shocks using the *HERMES* model. Each shock is calibrated to ensure an *ex ante* effect of €1 billion adjustment to the government balance. For example, when looking at tax multipliers, the income tax rate is adjusted to ensure that the total income tax bill will yield an additional €1 billion in 2013 (0.74 per cent of GNP and 0.6 per cent of GDP). Alternatively, for the public service wage shock the public service wage rate in public administration, health and education is adjusted so that the total public service wage bill falls by €1 billion in 2013. In each case the shocks are implemented in 2013 and then held unchanged in subsequent years.

In Table 6.7 we summarise the results of these shocks. The table shows both the impact and cumulative multipliers that pertain to each shock. The impact multiplier is defined as:

$$\frac{\Delta Y(t)}{\Delta X(t)}$$

where X is the fiscal instrument and Y is GDP. So for example in the case of income taxes, X is total income tax revenue.

The cumulative multiplier[47] is defined as:

$$\frac{\sum_{j=0}^{N}(1+i)^{-t}\Delta Y(t+j)}{\sum_{j=0}^{N}(1+i)^{-t}\Delta X(t+j)}$$

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[47]   See Spilimbergo *et al.* (2009). The interest rate used was 5 per cent.

TABLE 6.7   Estimates of Fiscal Multipliers

	Impact		Cumulative	
	Nominal GDP	Real GDP	Nominal GDP	Real GDP
TAXATION (Income Tax)	-0.4	-0.4	-0.3	-0.6
Current Expenditure				
Wages	1.3	0.3	1.5	0.5
Employment	1.2	1.2	1.5	1.2
Transfers	0.4	0.4	0.5	0.5
CAPITAL EXPENDITURE	0.5	0.6	0.8	0.6

The results suggest that *ceteris paribus* a reduction in government current transfers has the smallest effect on output, while a reduction in public service employment has the largest effect on output. The range is very wide, from 0.4 of real GDP for current transfers or income tax, to 1.2 for public service employment.

An Increase in Personal Tax Rate

In this shock the average rate of income tax was increased by an amount sufficient to raise €1 billion in income tax revenue in 2013 (0.6 per cent of GDP). Table 6.8 shows the results for the period 2013-2018. The peak impact would be in 2015. The increase in the personal income tax rate would reduce purchasing power and consequently the volume of consumption would be 1.1 per cent below the base (Table 6.8) in 2015. As a result output in market services would be reduced by 0.5 per cent and GNP would fall by 0.5 percentage points in 2015. The effects by 2018 would be somewhat lower.

The model assumes that workers bargain in terms of their real after-tax wage rate. As a result, under normal circumstances some of the increase in the tax rate would be passed on to employers in terms of higher wage demands. By 2018 wage rates would rise by 0.8 per cent.[48] This would result in a loss of competitiveness in the Irish economy and consequently output in the industrial sector would fall by 0.4 per cent by 2018. Lower levels of activity in manufacturing and market services would reduce total employment by 0.5 per cent by 2018 and this would lead to an increase in the unemployment rate of 0.2 percentage points.

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[48]   However, as discussed in Chapter 5, actual wage rates may be above their long-term equilibrium level with the adjustment to that equilibrium slowed by the stickiness of nominal wage rates in a downward direction. Under these circumstances a rise in taxation may not be passed on in terms of higher wage rates. In turn, the negative labour market effects might be slightly less than shown here.

TABLE 6.8   Income Tax Shock, Change from Baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	-0.2	-0.4	-0.4	-0.4	-0.4	-0.3
GNP	%Δ	-0.3	-0.4	-0.5	-0.4	-0.3	-0.3
Value added in industry	%Δ	-0.1	-0.3	-0.4	-0.4	-0.4	-0.4
Value added in market services	%Δ	-0.3	-0.4	-0.5	-0.5	-0.4	-0.4
Consumption	%Δ	-0.8	-1.0	-1.1	-1.0	-0.8	-0.7
Investment	%Δ	-0.9	-1.6	-1.7	-1.3	-0.9	-0.7
Exports of Goods and Services	%Δ	0.0	0.0	-0.1	-0.1	-0.2	-0.2
Consumption deflator	%Δ	0.0	0.1	0.1	0.1	0.1	0.1
Wages (non-agricultural)	%Δ	0.0	0.4	0.6	0.7	0.7	0.8
Total employment	%Δ	-0.1	-0.3	-0.5	-0.5	-0.5	-0.5
Employment in services sector	%Δ	-0.1	-0.2	-0.3	-0.3	-0.3	-0.4
Balances							
Unemployment Rate (ILO)	Δ	0.1	0.1	0.2	0.2	0.2	0.2
Current account of BOP as % of GDP	Δ	0.3	0.4	0.5	0.4	0.4	0.3
General Government Deficit as % of GDP	Δ	-0.5	-0.4	-0.3	-0.4	-0.4	-0.5
General Government Debt as % of GDP	Δ	-0.2	-0.6	-0.9	-1.2	-1.7	-2.1
Welfare							
GDP per capita	%Δ	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2
Consumption per capita	%Δ	-0.8	-0.9	-1.0	-0.9	-0.7	-0.6
Net Emigration	Δ	0.0	3.4	1.7	0.8	0.5	0.1
The shock							
Income Tax Receipts	€bn	1.0	1.1	1.1	1.2	1.3	1.4

The increase in the tax rate would lead to a lower level of demand in the economy and would reduce consumption and output. As a result, there would be a reduction in tax revenue due to lower profits and consumption. However, the increase in the tax rate would lead directly to an increase in government revenue. The overall impact would be a net improvement in the government borrowing requirement of 0.5 per cent of GDP.

In the long run the current account would improve by 0.3 percentage points of GDP as a result of the shock. This would reflect the deflationary impact of the tax increase. In the long run this improvement in the current account would hold out the potential for offsetting gains in terms of GDP. With government foreign indebtedness falling each year (compared to the baseline) as a result of the improvement in the deficit, there would be a related saving in foreign debt interest, with positive implications for GNP.

A Reduction in Public Service Wages

In this simulation we consider the impact of a fall in nominal wage rates in the public service that would reduce the public service pay bill by €1 billion in 2013. Wage rates in the private sector are assumed to be unaffected by the fall in public service rates. The cut in public service wage rates would result in lower incomes and would reduce government tax revenue. The overall impact would be a net improvement in the government deficit of 0.4 per cent of GDP by 2018 (Table 6.9).

TABLE 6.9   Public Service Wage Shock, Change from Baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2
GNP	%Δ	-0.3	-0.4	-0.4	-0.4	-0.3	-0.2
Value added in industry	%Δ	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1
Value added in market services	%Δ	-0.3	-0.4	-0.4	-0.4	-0.3	-0.3
Consumption	%Δ	-0.7	-0.9	-1.1	-1.0	-0.9	-0.8
Investment	%Δ	-0.8	-1.3	-1.5	-1.1	-0.8	-0.5
Exports of Goods and Services	%Δ	0.0	0.0	0.0	0.0	0.0	0.0
Consumption deflator	%Δ	0.0	0.0	0.0	0.0	0.0	0.0
Wages (non-agricultural)	%Δ	0.0	0.0	-0.1	-0.1	-0.1	-0.1
Total employment	%Δ	-0.1	-0.2	-0.3	-0.2	-0.2	-0.2
Employment in services sector	%Δ	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1
Balances							
Unemployment Rate (ILO)	Δ	0.1	0.0	-0.1	-0.1	-0.2	-0.3
Current account of BOP as % of GDP	Δ	0.3	0.4	0.4	0.4	0.3	0.3
General Government Deficit as % of GDP	Δ	-0.3	-0.3	-0.2	-0.3	-0.3	-0.4
General Government Debt as % of GDP	Δ	0.6	0.3	0.1	-0.2	-0.6	-1.1
Welfare							
GDP per capita	%Δ	-0.2	-0.2	-0.2	-0.1	-0.1	0.0
Consumption per capita	%Δ	-0.7	-0.8	-0.9	-0.9	-0.7	-0.6
Net Emigration	Δ	0.0	4.3	2.5	1.3	0.6	0.1
The shock							
Public Service Wage Bill	€bn	-1.0	-1.0	-1.0	-1.0	-1.1	-1.2

The fall in wage rates would lead to a reduction in consumption and a lower level of demand in the economy. In turn, this would impact on the output of the market services sector. Assuming that there was no response by private sector wages, there would be no direct impact on competitiveness. As a result, output in the rest of the economy would not respond and the cut in wage rates would lead to a reduction in GNP of 0.2 per cent by 2018. With tax rates held constant there

would be no impact on consumer prices. The reduction in consumption would see an improvement in the current account by 2018 of 0.3 percentage points of GDP.

As shown below, the negative effects on GNP of cutting public expenditure through reducing pay rates for the public service are likely to be significantly smaller than would be the case if a similar improvement in the borrowing requirement were achieved through cutting public service employment and the related services.

A Decrease in Public Service Employment

In this simulation the numbers employed in the public service were reduced so that the total public service wage bill fell by €1 billion in 2013 (Table 6.10). The reduction in employment is assumed to be maintained relative to the benchmark level until 2018. This shock would directly affect the volume of GNP and GDP by reducing public consumption by the amount of the fall in the public service wage bill. This would reflect the loss of public welfare as a result of the major reduction in the level of public services.

As shown in Table 6.10, the shock would have a significant impact on the volume of GNP and GDP, which would fall by 0.7 and 0.8 per cent respectively by 2018. The second round effects of this shock would arise from the reduction in purchasing power due to the reduction in the public service pay bill. As a result, the volume of consumption would fall by 0.7 per cent by 2018.

The reduction in health and education employment would affect the economy through a range of channels. First, the unemployment rate would initially rise by 1 percentage point. However, with emigration it would eventually fall back to 0.6 percentage points by 2018. The effect on the labour supply would be uncertain because of the unusual international environment. If the external environment were to continue to be very difficult such a level of emigration might not materialise resulting in higher unemployment in the medium term.

The reduction in wage rates of 0.6 per cent in 2018 as a result of the higher unemployment would improve competitiveness, resulting in a gradual increase in the volume of exports.

TABLE 6.10   Public Service Employment Shock, Change from Baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	-0.7	-0.8	-0.8	-0.8	-0.7	-0.7
GNP	%Δ	-0.8	-1.0	-1.0	-1.0	-0.9	-0.8
Consumption	%Δ	-0.2	-0.7	-0.8	-0.9	-0.8	-0.7
Investment	%Δ	-0.3	-0.8	-1.0	-0.9	-0.7	-0.5
Exports of Goods and Services	%Δ	0.0	0.0	0.0	0.1	0.1	0.1
Consumption deflator	%Δ	0.0	0.0	-0.1	-0.1	-0.1	-0.1
Wages (non-agricultural)	%Δ	0.0	-0.3	-0.3	-0.4	-0.4	-0.5
Total employment	%Δ	-1.2	-1.2	-1.2	-1.2	-1.1	-1.1
Balances							
Unemployment Rate (ILO)	Δ	1.0	0.9	0.8	0.8	0.7	0.6
Current account of BOP as % of GDP	Δ	0.1	0.2	0.3	0.3	0.3	0.2
General Government Deficit as % of GDP	Δ	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
General Government Debt as % of GDP	Δ	0.6	0.5	0.4	0.2	0.0	-0.3
Welfare							
GDP per capita	%Δ	-0.7	-0.7	-0.7	-0.6	-0.5	-0.4
Consumption per capita	%Δ	-0.2	-0.6	-0.7	-0.7	-0.6	-0.4
Net Emigration	Δ	0.0	4.0	3.3	1.8	1.1	0.5
The shock							
Public Service Wage Bill	€bn	-1.0	-1.1	-1.1	-1.1	-1.2	-1.2

By 2018 the reduction in the government borrowing requirement arising from the cut in employment would amount to around 0.2 percentage points of GDP.

A reduction in transfers

Cuts to current expenditure have accounted for close to 60 per cent of the overall fiscal consolidation measures introduced by the government since 2008. This simulation examines the impact of a €1 billion reduction in government current expenditure on transfers. The cut in government transfers would reduce household disposable income and, as a result, consumption would fall by 1.1 per cent by 2015 falling to 0.6 per cent by 2018. Lower consumption would reduce the level of demand in the economy with the result that output in market services would fall by around 0.5 per cent in 2015 falling to 0.2 per cent by 2018. Lower imports would result in an improvement in the current account as a percentage of GDP of around 0.2 per cent in the medium run (Table 6.11).

TABLE 6.11   Government Transfers Shock, Change from Baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	-0.2	-0.3	-0.4	-0.3	-0.3	-0.2
GNP	%Δ	-0.3	-0.4	-0.4	-0.4	-0.3	-0.2
Value added in industry	%Δ	-0.1	-0.2	-0.3	-0.2	-0.2	-0.1
Value added in market services	%Δ	-0.3	-0.4	-0.5	-0.4	-0.3	-0.2
Consumption	%Δ	-0.8	-1.0	-1.1	-1.0	-0.8	-0.6
Investment	%Δ	-0.9	-1.5	-1.7	-1.2	-0.7	-0.4
Exports of Goods and Services	%Δ	0.0	0.0	0.0	0.0	0.0	0.0
Consumption deflator	%Δ	0.0	0.0	0.0	0.0	0.0	0.0
Wages (non-agricultural)	%Δ	0.0	0.0	0.0	0.0	0.0	0.0
Total employment	%Δ	-0.1	-0.2	-0.3	-0.3	-0.2	-0.2
Employment in services sector	%Δ	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2
Balances							
Unemployment Rate (ILO)	Δ	0.1	0.2	0.2	0.2	0.1	0.1
Current account of BOP as % of GDP	Δ	0.3	0.4	0.4	0.4	0.3	0.2
General Government Deficit as % of GDP	Δ	-0.5	-0.4	-0.3	-0.3	-0.4	-0.4
General Government Debt as % of GDP	Δ	-0.2	-0.5	-0.7	-1.0	-1.4	-1.8
Welfare							
GDP per capita	%Δ	-0.2	-0.3	-0.3	-0.3	-0.2	-0.1
Consumption per capita	%Δ	-0.8	-1.0	-1.1	-1.0	-0.7	-0.5
Net Emigration	Δ	0.0	1.0	0.8	0.6	0.3	0.0
The shock							
Transfers	€bn	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0

As a consequence of the fall in output, and also because of the fall in consumption, total employment would fall by 0.2 per cent, due mainly to a reduction in service's sector employment. The unemployment rate would increase slightly by 0.1 percentage points in the long run.

The reduction in government spending would lead directly to a reduction in the government deficit of 0.4 per cent of GDP. However, the deficit would not improve by the full amount of the reduction in government spending (€1 billion, or 0.6 per cent of GDP) as some of the savings from reduced transfers would be offset by lower taxes from other sources as a result of the decline in services output and consumption.

In the medium term, both GNP and GDP would be reduced by around 0.2 per cent. Regarding economic welfare, the reduction in transfers would result in

consumption per head being 0.5 per cent lower by the end of the period. Here we take no account of the distributional effects.

A Reduction in Public Sector Investment

In this simulation we consider the impact of a €1 billion reduction in expenditure on public investment. These results only take account of the demand side impact of the change in investment. They take no account of the longer-term supply side impact, reducing national output and productivity as a result of the reduced stock of infrastructure. If the investment were in productive infrastructure this supply side effect could dominate the short-term demand effects (FitzGerald and Morgenroth, 2006; Bradley and Untiedt, 2012).

TABLE 6.12   Public Sector Investment Shock, Change from Baseline

		2013	2014	2015	2016	2017	2018
Growth, prices, employment							
GDP	%Δ	-0.3	-0.4	-0.4	-0.3	-0.3	-0.2
GNP	%Δ	-0.4	-0.4	-0.4	-0.3	-0.3	-0.2
Value added in industry	%Δ	-0.9	-0.9	-0.8	-0.7	-0.5	-0.3
Value added in market services	%Δ	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2
Consumption	%Δ	0.0	-0.2	-0.2	-0.3	-0.2	-0.2
Investment	%Δ	-6.6	-5.9	-4.8	-3.6	-2.8	-2.5
Exports of Goods and Services	%Δ	0.0	0.0	0.0	0.0	0.1	0.1
Consumption deflator	%Δ	0.0	0.0	0.0	0.0	-0.1	0.0
Wages (non-agricultural)	%Δ	0.0	-0.2	-0.2	-0.3	-0.3	-0.2
Total employment	%Δ	-0.6	-0.6	-0.6	-0.5	-0.4	-0.4
Employment in services sector	%Δ	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Balances							
Unemployment Rate (ILO)	Δ	0.5	0.5	0.4	0.4	0.3	0.2
Current account of BOP as % of GDP	Δ	0.4	0.4	0.4	0.4	0.3	0.3
General Government Deficit as % of GDP	Δ	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
General Government Debt as % of GDP	Δ	0.0	-0.3	-0.6	-0.9	-1.3	-1.7
Welfare							
GDP per capita	%Δ	-0.3	-0.3	-0.3	-0.3	-0.2	-0.1
Consumption per capita	%Δ	0.0	-0.1	-0.1	-0.2	-0.2	-0.1
Net Emigration	Δ	0.0	1.3	1.3	0.8	0.4	0.1
The shock							
Public Sector Investment	€bn	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0

Table 6.12 shows that the demand side impact of this shock would have a relatively minor effect on output and employment in the economy in the short to medium term. The primary incidence of the shock would be on the building

sector where output, employment and investment would fall. The lower level of demand in the building sector would lead to a reduction in total employment of 0.6 per cent in 2013 and 2014, falling to 0.4 per cent by 2018. The unemployment rate would end up 0.2 percentage points higher in 2018. As a result there would be a slight reduction of 0.2 per cent in wage rates by 2018 (Table 6.12).

Over the medium term, GNP and GDP would fall by 0.2 percentage points. The €1 billion cut in investment expenditure would have a big effect on the public finances, with the government deficit as a percentage of GDP falling by around 0.4 percentage points in the long run.

6.5   Conclusions

The analysis in this chapter helps explain how the Irish economy behaves and it provides the basis for many of the results in earlier chapters in this *Review*. A good understanding of the behaviour of the economy will allow readers to assess new information that becomes available on the progress of the world economy and how it will affect Ireland. The results in this chapter also provide a tool to assess how domestic policy measures can best be targeted to raise the performance of the economy in the medium term.

There are still some important gaps in our understanding of how the economy works. In particular, work is under way to develop a model of how the financial sector interacts with the rest of the economy. Pending the completion of such a complete model of the economy, the authors have used their judgement to incorporate the results of the latest available research on this topic in the analysis in this *Review*.

Chapter 7

Conclusions

The experience of the last five years has been truly exceptional, involving the worst economic crisis in Ireland since the Second World War. The true magnitude of the problems facing the country took some time to become manifest and the cumulative cost to Ireland of dealing with the fall-out of the crisis has been immense. The legacy effects of the crisis include a dramatic increase in the indebtedness of the state as well as an exceptionally high level of unemployment. From having a very low level of public debt in 2007 the position has been dramatically transformed, so that the level of public debt pushed the limits of sustainability. A key factor in the increase in indebtedness was the decision to guarantee, and ultimately to pay for much of the losses in the banks – this added around 40 percentage points of GDP to the debt. At least as serious as the problem with the public debt is the fact that the economy has been moved from a position of near full employment to one where around 14 per cent of the labour force is unemployed. This has major consequences, in terms of the incidence of poverty, and it is also a key factor driving the banks' problems with mortgage default (Kelly and McQuinn, 2013). These legacy problems will, at best, take some considerable time to be resolved.

Because of the uncertainty about the future, in this *Review* we consider three different possible scenarios or paths for the economy over the rest of the decade.

In the first scenario, which we considered in detail in Chapter 5, the EU economy is assumed to return to a reasonable rate of growth over the rest of the decade; this would provide a rather different environment for the Irish economy from the current situation. Under these circumstances, the tradable sector of the economy would see its markets grow. With its improved competitive position, this would allow a significant growth in the output and employment of the tradable sector. In turn, this growth in foreign demand would help produce a turnaround in domestic demand.

With firms increasing their sales and their profitability, they would need to invest to facilitate a continuation of this process. With a return to rising real incomes and some growth in employment, consumption would also begin growing again. Demographic pressures would also mean that more dwellings would need to be built later in the decade and a recovery in household circumstances would mean that this investment could, in theory, be financed.

When all of these factors are combined in the *Recovery* scenario they would result in a picture of significant progress over the rest of the decade. The return to significant growth, including growth in employment-intensive domestic demand, would see employment increase at a reasonable pace. In this scenario unemployment would fall in the second half of the decade. While the economy would not be likely to reach full employment by 2020 in this scenario, the level of unemployment could be dramatically reduced from its current level.

In the past a major constraint on rapid growth in domestic demand came from the public finances and the current account of the balance of payments. However, in the case of the *Recovery* scenario, because the initial stimulus would come from a recovery in the EU economy and, therefore, a recovery in Irish tradable sector output, there would be no problem with the current account of the balance of payments and, hence, no need to fund the recovery through foreign borrowing. The recovery itself would play a major role in restoring the public finances to a sustainable path. This would allow a change to a fiscal stance that would be much more supportive of growth in the economy, in contrast to the necessary contractionary impact of fiscal policy over the period 2009-13.

The second scenario, discussed in Chapter 5, the *Delayed Adjustment* scenario, considers what would happen if the EU economy recovered but domestic policy did not rapidly resolve the ongoing problems in the Irish financial system or if some other event or policy failure prevented the domestic economy from benefiting from a wider economic recovery. Such a scenario could see the economy seriously underperform its potential.

In the third case, what we have termed the *Stagnation* scenario, we have considered the circumstances where the EU economy does not return to growth in the near future. The result would be a "zombie" decade for the EU and this would have serious consequences for Ireland. As analysed in Chapter 6, world growth, including growth in the EU, is a key driver for the Irish economy. Under this *Stagnation* scenario, where the EU economy would fail to grow for the rest of the decade, there would be very little scope for the Irish economy to grow on its own. Any attempt to use domestic policy to increase growth through stimulating domestic demand would rapidly run into twin constraints: the need to keep the government debt within bounds where it would be sustainable and also the need to maintain broad balance on the current account of the balance of payments (rising domestic demand would drive up imports).

7.1   Policy Implications – Public Finances

The wide range of possible outcomes, encompassed in the three scenarios presented in Chapter 5, make it difficult to formulate a medium-term fiscal policy. Under these circumstances the best approach is to choose policy options which are likely to be reasonably robust in the face of different outcomes. As new information becomes available, the policy approach taken will need to be tailored to meet the changing circumstances.

The three scenarios discussed in Chapter 5 would see Ireland moving towards sustainability in terms of its ability to service its debts. However, in the case of the *Stagnation* scenario, it could be a close run thing. By contrast, in the case of the *Recovery* scenario the current problem of indebtedness could be dramatically reduced by 2020 if appropriate domestic policies were pursued.

Any major adverse shock to the *Stagnation* scenario could throw the economy off course in a way that would see the debt burden start to rise. In particular, if the financial sector required major additional capital from the Irish government over the course of the decade (e.g., to meet Basel III regulations) this could push the economy onto a path towards financial instability. Related to this, the reaction of the financial markets to such a "shock" could contribute to further destabilising the situation. The consequence might be that the economy was set on an unsustainable course, where the debt burden was rising continuously.

In the case of the *Stagnation* scenario the first priority for policy would be to address the failure of the EU economy to grow. This would not be something an Irish government could do on its own but would, rather, be an essential task for Europe as a whole. While particularly unpleasant for Ireland, this scenario would also see huge losses of potential output in the EU and a major waste of resources from unemployment across the EU; other EU governments would also want to see growth restored.

In Chapter 5 we considered the implications for the *Stagnation* scenario of pursuing a neutral fiscal policy from 2015 onwards where the government was neither stimulating the economy nor taking deflationary action. This showed that this policy would result in the public finances remaining on an unsustainable path for the foreseeable future. This simulation makes it clear that in the *Stagnation* scenario it would be essential to undertake a substantial further fiscal adjustment after 2014. The necessary adjustment would be even greater than that envisaged today for 2015 (around €2 billion), continuing on into the second half of the decade.

If the *Recovery* scenario proves to be closest to actual outturn, the planned 2014 Budget, with cuts of €3.1 billion, would probably be the last really restrictive Budget that would be needed to restore the public finances to a stable path. If implemented, and if the *Recovery* scenario proved correct, it would probably allow for an easing in the fiscal stance from 2015 onwards, avoiding the need for the further planned cuts in the 2015 Budget. With such an approach to fiscal policy, the general government balance would move into surplus in 2017 or 2018 and the debt burden would be substantially reduced by 2020.

If it was certain that the economy was on the *Recovery* path, then a postponement of some of the measures planned for the 2014 Budget might even be possible. However, as there is no certainty as to what path the economy will follow over the rest of the decade it would be imprudent to delay the 2014 adjustment. If, instead, the path the economy followed was closer to the *Stagnation* scenario then the delayed adjustment could prove very costly. In addition, even if the economy followed the *Recovery* scenario, delaying the fiscal adjustment would have a cost, reflecting the high real interest rate on government borrowing, even under these more favourable circumstances. Also, from a political economy point of view, if a halt were called to fiscal adjustment in 2014 it could be difficult to return to the necessary, albeit limited, fiscal tightening needed in 2015 or 2016 to finally ensure that the public finances were on a sustainable path. Finally, under current Irish and EU legislation the government has, in any event, little choice but to implement the 2014 Budget as planned.

Over the coming year it is hoped that the EU economy will turn the corner and return to growth. If, by this time next year, it becomes clear that this has happened, then it would be appropriate to abandon the planned €2 billion in cuts in the 2015 Budget. Even without these cuts the Budget for 2015 would still be restrictive but it would have a less negative impact on output and, crucially, under the *Recovery* scenario it would be consistent with the public finances moving into surplus in 2017 or 2018. However, if the EU economy continues to stagnate next year then there will be little choice but to implement €2 billion of cuts in the 2015 Budget as currently panned.

7.2   Policy Implications - The Banking Sector

As discussed in Chapter 5, in the case of the *Stagnation* scenario there would be a serious danger that the banking system might need an injection of additional capital before the end of the decade. Under these circumstances, the first priority for policy would be to ensure that commitments from the EU on recapitalising banks are crystallised, so that any future capital needs of Irish banks would be

met from the EU ESM. This would minimise the risk to Ireland from future "shocks" in the banking sector. Without such an insurance against "shocks", the economy could easily slide into a vicious circle of a rising debt burden and rising interest rates. Even with continuing fiscal tightening well into the second half of the decade, this danger would still exist under this scenario.

As discussed in Chapter 5, in the case of the *Recovery* scenario, if appropriate policies were followed, there would be a good chance of the state realising a gain from its financial assets around the end of the decade, reducing the debt burden by a further significant amount. However, this will only happen if appropriate policies are followed: the banking system must be returned to profitability in a tight time-scale, while minimising the sector's losses on its outstanding loans, and the banking system must be able to fund a recovery in the economy by providing adequate credit.

In the *Recovery* scenario it is assumed that the government manages to deal with the current problems in the banks in an effective and speedy manner. The government, as the major shareholder in the banks, must ensure that it maximises its return from the banks (minimising its cumulative losses) through ensuring that, wherever possible, debt outstanding is repaid to the banks. A failure to maximise the return to the banks on their loans could see a serious further loss of money by the state.[49] While the banks have been given a huge amount of capital by the state, they hold it in trust for their owner, the Irish people. Every billion euro of capital not recovered by the banks for the shareholder is a billion euro that would have to be raised in future taxes or through future expenditure cuts. Even with good management there will be further major write-offs in the banks reflecting the fact that a substantial number of mortgage-holders and businesses will never be able to service their loans.

In addition to the danger to the government's financial position that further losses in the banks would entail, a second danger lies in the fact that the recovery of the economy will only take place if the necessary finance is available to fund investment. While there may not be that much demand for funding today (O'Toole, Gerlach-Kristen and O'Connell, 2013) the volume of future investment under the *Recovery* scenario will require a major increase in financial resources over the rest of the decade. (Under the *Stagnation* scenario, with limited investment the funding needs of the economy would be much lower.)

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[49] For example, through failing to ensure that those who can repay their loans do so.

Chapter 5 considered a third, *Delayed Adjustment*, scenario where Europe returned to growth but the challenges in the banking sector were not addressed effectively. In that case, it was assumed that the financial sector could require an input of further funds that might not be forthcoming from the EU ESM. This would put the public finances under further pressure. The risk premium on government borrowing would rise, causing additional negative feedback effects. Possibly more serious would be the case where the domestic banking sector proved unable to fund a possible recovery in economic activity. This could seriously delay a real recovery in the economy and, especially, a recovery in the domestic labour market. In turn, this could add to the banks' losses (Kelly and McQuinn, 2013).

7.3   Labour Market Policies

The Irish economy is currently experiencing an exceptionally high level of unemployment. The problem would be even worse, were it not for the extent of net emigration and the fall in labour force participation experienced in recent years. This high level of unemployment is a major factor in the increasing number of households experiencing poverty. It is also a major factor in the rapidly rising number of households that are unable to service their mortgages. Tackling this problem over the coming years will be a key task for domestic economic policy.

Under the *Recovery* scenario the labour market would show significant improvement over the rest of the decade. The move back towards full employment (though still some distance away in 2020), would be facilitated by the fact that such a trajectory for the economy would involve quite a rapid growth in investment, including investment in housing. Whether this growth in employment would be fully translated into the envisaged reduction in unemployment would depend on the labour market policies deployed over the next few years.

As discussed in Chapter 2, the educational profile of the unemployed is much more favourable than the last time Ireland experienced such high unemployment in the early 1990s. With the vast bulk of the unemployed having at least a Leaving Certificate, and many of them having third level education, those with a good education are quite likely to find jobs in a recovering labour market. However, for those with limited education and skills, access to the new jobs that would be created under this scenario might not be easy. Labour market policy should be targeted at these more vulnerable unemployed with a view to equipping them with the skills that will be needed in a recovering economy (Bergin, Kelly and McGuinness, 2012).

However, the experience of the 1990s is also salutary. High levels of long-term unemployment in the early 1990s resulted in the skills and training of the unemployed being eroded. The effects of this deskilling were reflected in significant hysteresis in the labour market; unemployment continued to be high in the mid-1990s in the face of rapid growth. A very important task for labour market policy today is to try and ensure that the experience of the 1990s is not repeated and that a recovery in output is reflected rapidly in a reduction in unemployment.

In the case of the *Stagnation* scenario, the level of unemployment would remain high out to the end of the decade. One of the reasons that it would remain high would be that, under this scenario, the wider EU labour market would also be experiencing major difficulties so that opportunities for emigration would be limited. Under these circumstances active labour market policies may be less effective as the number of new jobs occurring in the economy would be quite restricted. Those with the most limited education or skills would be particularly disadvantaged under these circumstances.

7.4   EU policy

One of the big problems facing Ireland over the last three years has been the inappropriate stance of aggregate fiscal policy in the Eurozone. As discussed in *EUROFRAME, 2013*, the effect of EU fiscal policy has been to bring about a major reduction in the growth rate in 2012 and 2013, with a smaller reduction in prospect for 2014. This has meant that fiscal policy has operated in a strongly pro-cyclical manner, making the necessary adjustment process in Ireland, Spain, Portugal and Greece even more difficult.

For countries such as France, Belgium and the Netherlands, where their budget deficits were primarily due to cyclical factors, delaying the limited fiscal adjustment needed to eliminate any structural deficit was both possible and sensible. However, EU rules, instead of enjoining sensible policies, required a strongly pro-cyclical approach to fiscal policy in those countries.

It is only in the last few months that this approach has changed. The French government recently decided that existing fiscal policy would not be tightened because of a prospective rise in the cyclical deficit. This has been approved by the EU Commission and by other EU members, a welcome change in approach.

On the basis of current plans, as long as EU governments do not implement a further tightening of their fiscal policy for next year, the overall stance of fiscal

policy in the EU will be less contractionary in 2014 than it is today. This holds out the prospect that the EU economy could, as a result, return to growth in 2014 in a situation where the negative drag of fiscal policy is very much reduced from what it is in 2013.

The effect of the current crisis has been to fragment the Single Market in financial services in a way that few had previously contemplated. The cost and availability of capital for business differs to a very considerable extent depending on the country in which a firm is located. A significant part of the excess cost of capital for individual households and firms in countries such as Spain, Ireland and Italy represents country risk rather than the inherent risk of the individual loan. If this were to persist for long it would see firms in the disadvantaged countries, such as Ireland, Italy, and Spain, rendered very much less competitive than identical firms in more favoured locations.

If financial markets were operating competitively then this problem would be gradually eroded by market forces. Better funded banks would open up in the less favoured locations, gradually equalising the terms on which finance was made available. However, the financial system is broken in Europe and developments in regulation have reinforced this trend rather than ameliorating it. If this disintegration of the Single Market were to persist for long it could do major damage to the growth of the EU economy and, especially, to growth in those countries that have financial difficulties (Barrell, *et al.*, 2011).

The only solution to this crisis is to press ahead very rapidly with banking union in the EU. This must involve a common supervisory regime as well as common rules on resolution of banks in difficulties. To the extent that there are costs for taxpayers arising from any future resolution of bust banks, these must be socialised within the EMU.

This legislative framework should provide the necessary infrastructure to allow a proper EU banking system to develop. Such a development will take some considerable time, even with a speedy implementation of banking union. When it is fully operational it should see firms' access to finance being determined by individual firm (or household) risk rather than by national risk. This would level the playing field within the Single Market.

7.5   Future growth strategy

Ireland has evolved its long-term economic strategy over the last 40 years. Consideration needs to be given today as to how it should evolve over the next

two decades. A number of challenges face the country. Probably the most dangerous was the tempest in the Eurozone over the last five years. However, it now looks as if we are reaching calmer waters and a break-up is looking increasingly unlikely.

The current crisis will eventually pass and issues, which may seem to be crucial today to Ireland's economic survival, will be superseded by new priorities, new problems and new opportunities over the coming decade. As a result, when considering the appropriate long-term economic strategy for Ireland there is a need to stand back from current problems and visualise an Ireland without an economic crisis.

There are new economic challenges that will need to be addressed over the coming decade:

- Over the last 40 years Ireland's competitive advantage has evolved and to some extent this evolution has been moulded by public policy. The task now is to identify how it should evolve over the coming decades and to adjust domestic policy to facilitate this evolution.

- The future configuration of the European financial system will affect Ireland. Banking Union is a necessary but not a sufficient condition for the restoration of the Single Market in financial services, something that is important for Ireland.

- The future shape of the EU, including questions about the UK's future membership and extensions of membership beyond the current 28, will have implications for the Irish economy.

- While Ireland's demographics remain favourable relative to our EU partners, it is clear that future decades will see a major increase in the burden on the state arising from the ageing of the population.

- However, the first priority for public policy remains the need to restore order to the Irish public finances and to ensure that the burden of the debt falls over the rest of the decade.

- A growing population will require additional infrastructure and it will put additional pressure on public services such as education. Managing this development in an economically and environmentally sustainable manner has implications for spatial planning over the coming decade.

- The growing diversity of the population will provide a stimulus to innovation and new thinking. However, managing integration effectively will also provide a challenge for public policy.

However, the first priority for public policy remains the need to restore order to the Irish public finances and to ensure that the burden of the debt falls over the rest of the decade.

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Appendix 1: Forecasting Record of the *Medium-Term Review*

As discussed in the Introduction to this *Review*, the purpose of this publication is to provide analysis that can inform policy rather than providing forecasts for the economy in the medium term. The objective of each *Review* is to answer the question of how best macroeconomic policy can influence the future growth path of the economy. To undertake this task it is essential to prepare scenarios for the possible trajectory of the economy in the medium term. The scenarios should be realistic and should, if possible, encompass the actual outturn for the economy in the medium term. However, the most important test of the value of this exercise is whether it provides a useful input for policymakers. This issue is addressed in FitzGerald (2012a) and FitzGerald (2012b).

In this Appendix we review the reliability of the scenarios published in the last 11 *Reviews*. We also include the results of two more limited exercises published in 2009 and 2010. This exercise is useful in providing guidance as to how we can improve this *Review* and future similar exercises. One of the key lessons drawn in this publication is that the range of the scenarios considered in previous *Reviews* was too narrow. As a result, in this *Review* the difference between the growth rates in the highest and the lowest scenarios is greater than in the past. To some extent this reflects the greater uncertainty arising from the experience of the recent crisis.

TABLE A1.1   Forecast Growth Rate of GNP, Annual Average, per cent

Number	Period	Forecast	Actual, including latest forecast	Error	Absolute Error
1	1986-90	3.0	2.8	0.2	0.2
2	1987-92	2.6	3.0	-0.4	0.4
3	1989-94	5.1	3.8	1.3	1.3
4	1991-96	3.7	5.0	-1.3	1.3
5	1994-00	5.3	8.1	-2.8	2.8
6	1997-03	4.6	5.8	-1.2	1.2
7	1999-05	5.4	4.9	0.5	0.5
8	2001-07	4.5	4.5	0.0	0.0
9	2003-10	2.8	1.1	1.7	1.7
10	2005-12	3.5	0.0	3.5	3.5
11	2008-15	3.2	-0.3	3.4	3.4
12	2009-15	3.7	1.4	2.4	2.4
13	2010-15	3.0	1.4	1.6	1.6
				Average	
	Reviews 1-7			-0.5	1.0
	Reviews 1-13			0.7	1.6

Table A1.1 shows the forecast for GNP growth over the horizon used in each *Review*. Taking the 13 forecasts made over a period of 25 years the average error in forecasting GNP was an overestimate of 0.7 percentage points. Taking the first seven *Reviews* – those that did not span the crisis years of 2008-13 – the average error was an underestimate of the growth rate of 0.5 percentage points.

However, in using the average forecasting error the underestimation of the growth in the first two decades offsets the very substantial forecasting error in the recent period. As a result, a much more useful measure of the forecasting performance is the average absolute error. In the period before the crisis this error was 1 per cent of GNP. However, once the recent period is included the average error rises to 1.6 percentage points.

TABLE A1.2   Forecast of Unemployment Rate, Annual Average, Per Cent of Labour Force

Number	Period	Forecast	Actual, including latest forecast	Error	Absolute Error
1	1986-90	17.9	15.9	2.0	2.0
2	1987-92	18.7	15.6	3.1	3.1
3	1989-94	13.8	15.2	-1.4	1.4
4	1991-96	15.9	14.7	1.2	1.2
5	1994-00	14.9	11.0	3.9	3.9
6	1997-03	10.1	7.9	2.2	2.2
7	1999-05	7.0	6.7	0.3	0.3
8	2001-07	7.2	6.4	0.9	0.9
9	2003-10	10.9	8.7	2.2	2.2
10	2005-12	9.0	11.5	-2.5	2.5
11	2008-15	8.6	15.2	-6.6	6.6
12	2009-15	14.0	16.4	-2.4	2.4
13	2010-15	12.7	16.7	-4.0	4.0
				Average	
	Reviews 1-7			1.5	1.9
	Reviews 1-13			-0.1	2.5

Table A1.2 shows the forecast for the unemployment rate (PES) over the horizon used in each *Review*. In the first seven publications the average overestimation of the unemployment rate was 1.5 per cent of the labour force. However, when the full 13 publications are considered the average error is almost zero. This reflects the big underestimation of the unemployment rate in the recent crisis period.

Using the more appropriate average absolute error, the error for the first 7 publications is just under 2 percentage points and this rises to 2.5 percentage points when the recent period is included.

While the results for the most recent crisis are very unsatisfactory it must be acknowledged that it was a truly exceptional period and the record of other forecasters in other countries was no better. Under more normal circumstances the scenarios presented in previous *Reviews* were adequate to produce sensible policy implications. Indeed, over the course of the period 2000-2007, the analysis in successive *Reviews* and other ESRI publications pointed to the increasing dangers the economy faced from the growing property market bubble.

Appendix 2: Modelling the Effects of Fiscal Policy 2010-13

In this Appendix we analyse the impact on the economy of the contractionary fiscal policy of the period 2010-13. This allows us to assess how much of the weakness in economic growth was directly attributable to the necessary tightening of fiscal policy and how much to other factors, external and internal. In turn, this decomposition can help us understand how the economy may perform in the next few years, as the contractionary stance of fiscal policy is eased.

This analysis should not be taken to suggest that a neutral budgetary policy was a feasible policy option. On the contrary, it is absolutely clear that the fiscal adjustment undertaken was the minimum necessary to ensure that the government could raise funding to cover the continuing massive deficit. Without the intervention of the Troika and other EU partners who provided essential funding, a much more brutal adjustment would have proved essential. Unfortunately, because of the funding problems there was no choice but to implement this strongly pro-cyclical fiscal policy.

To undertake this analysis we first assume that all budgetary adjustments, including those planned for 2014, are implemented in full (we refer to this as the *Recovery* scenario[50]). Using the *HERMES* macro-economic model we then examine the path the economy, and in particular the public finances, could have followed had these adjustments not been implemented. To do this we implement an "indexed" budget, using a set of detailed indexation rules which are included in the ESRI *HERMES* macroeconomic model (see Bergin *et al.*, 2013). These rules try and represent what a Budget would look like which neither stimulated the economy nor deflated it – that was neutral. Using these rules, we simulate the model assuming such a stylised neutral Budget was adopted in 2010 and subsequent years. Compared to the base, which includes all the cuts of the years since 2010, this is equivalent to an ex ante public finance stimulus of €21.5 billion over the period 2010-2015.[51]

Table A2.1 presents an overview of the impact of this "no austerity" scenario on the economy out to 2013. The results suggest that the cumulative effect of contractionary fiscal policies since 2010 has been to reduce the growth rate over the period by between 0.75 per cent and 1 per cent a year so that, by 2013, the level of both real GDP and GNP were between 3 and 3½ percentage points lower than they would have been under a "neutral" fiscal policy. The estimated effect

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[50] The details of this scenario for 2014-15 are spelt out in Chapter 3.
[51] Note the shock is implemented from 2010 onwards, and so excludes the adjustments made in 2009 which amounted to an ex ante budgetary adjustment of €7.5 bn.

of fiscal tightening has been particularly severe on domestic economic activity, with a reduction in the level of consumption by 2013 of up to 7 percentage points relative to the base levels. By contrast, the results suggest that the fiscal adjustment has had a negligible effect on exports.

TABLE A2.1 Full Fiscal Indexation from 2010 Onwards: Effect on Main Aggregates

		2010	2011	2012	2013	2014	2015
GDP	%Δ	0.9	2.0	2.8	3.2	3.6	3.6
GNP	%Δ	1.0	2.1	2.8	3.4	3.6	3.6
Consumption	%Δ	1.8	4.6	6.1	7.1	8.6	9.7
Exports of Goods and Services	%Δ	0.0	0.0	0.1	0.2	0.3	0.4
Wages (non-agricultural)	%Δ	0.0	-0.2	-1.6	-2.6	-3.1	-3.5
Total employment	%Δ	0.7	1.4	2.4	3.5	4.0	4.2
Net Emigration	Δ	0.0	-5.0	-14.5	-10.8	-6.8	-5.8
Unemployment Rate (ILO)	Δ	-0.5	-1.0	-1.2	-1.7	-1.9	-2.0
Current account of BOP as % of GDP	Δ	-1.8	-3.8	-5.1	-5.7	-6.6	-6.8
General Government Deficit as % of GDP	Δ	1.5	4.7	6.0	6.0	7.8	8.5
General Government Debt as % of GDP	Δ	0.9	4.8	10.4	16.0	23.1	30.4
Debt interest payments as % of GDP	Δ	1.1%	0.1%	0.9%	1.1%	1.3%	1.8%

In the *HERMES* model it is assumed that employers and employees bargain over the real after-tax wage. With an indexed or neutral budget implying, much lower direct and indirect taxation rates than was actually the case, this would have meant that the negotiated wage rate would have been significantly lower; by 2015 wage rates would have been 3½ per cent lower than in the *Recovery* scenario. With lower wages and higher domestic demand, total employment would have been over 4 per cent higher by 2015. Better employment prospects would have ensured that the flow of migration would have been reduced, with cumulative net emigration over 40,000 lower than in the *Recovery* scenario.

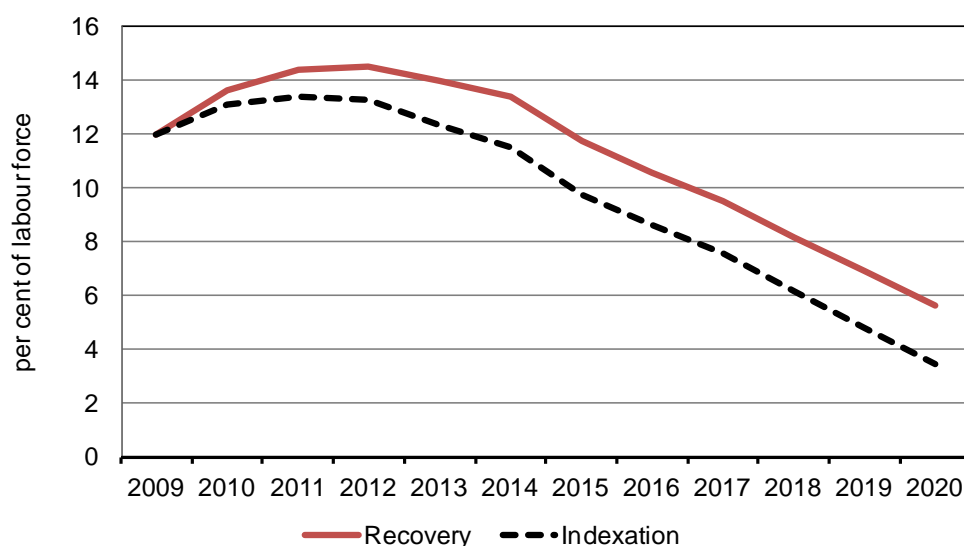**FIGURE A2.1** Alternative Scenarios for Unemployment Rate

Figure A2.1 shows the path of the unemployment rate under an indexed budget scenario. By 2019 the unemployment rate would have been close to its pre-crisis rate, approaching 5 per cent of the labour force. This is compared to the elevated rate of 7 per cent in the *Recovery* scenario, despite significantly higher levels of emigration. These implied costs of the very large budgetary adjustment are real, high and persistent over the medium-term.

**FIGURE A2.2** Increase in Risk Premium in the "no austerity" Shock
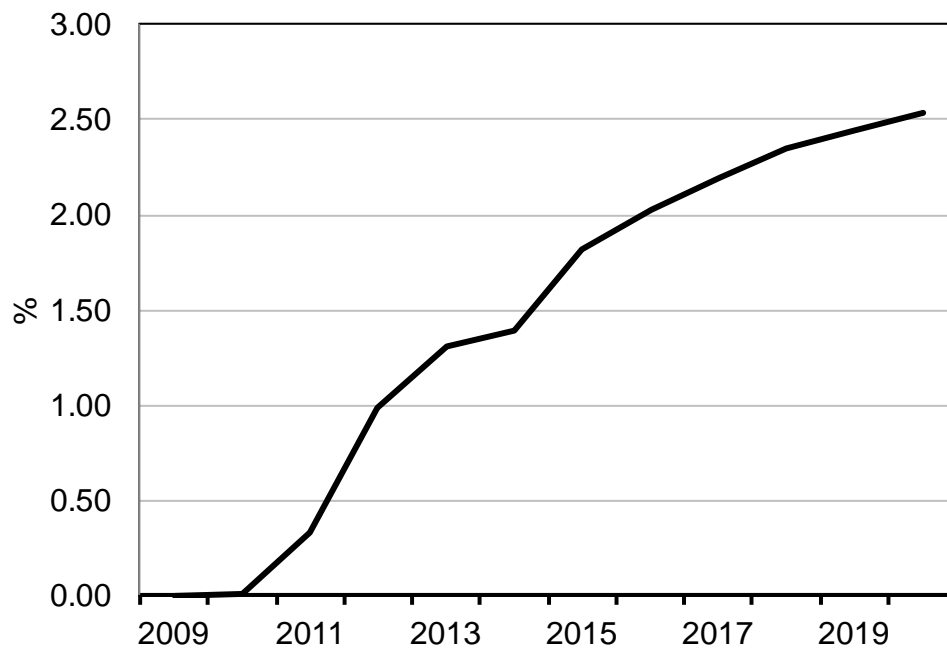
The aggregates in Table A2.1 above highlight the significant costs to the economy of the fiscal tightening. However, the Table also includes key public finance aggregates that provide a stark estimate of the possible costs that would have resulted from a failure to implement the austerity programme from 2010 to 2015 (of course this was not an option open to the government). The rapid deterioration in Ireland's debt position in 2009 and in particular in 2010, culminating in the entry into an IMF/EU funded programme in late 2010, saw the risk premium on Irish government debt rise dramatically. As discussed in Box B in Chapter 3, in the latest version of *HERMES* the risk premium is endogenous, with a relationship calibrated as a function of government debt and government borrowing. Under this "no austerity" scenario, the greatly elevated level of the debt-GDP ratio and the deficit-GDP ratio would have served to increase the risk premium on Irish government debt, further destabilising the public finances (Figure A2.2).

In fact, as discussed above, the risk premium on government debt was effectively infinite in late 2010 – the government could not borrow the sums it needed at

any realistic interest rate. It was only the intervention of the Troika that provided the funding needed to undertake a gradual fiscal adjustment.

FIGURE A2.3 Alternative Scenarios for Debt-GDP Ratio
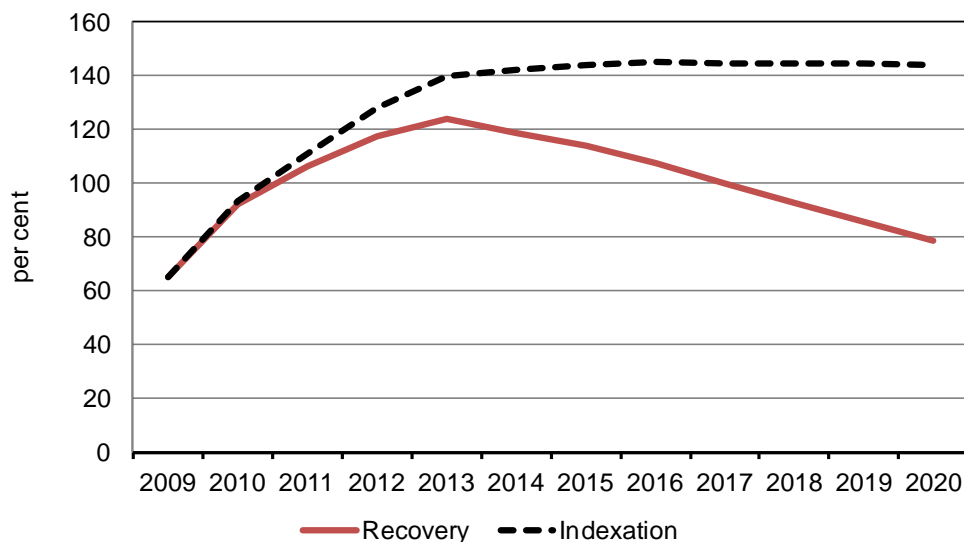
The consequences of a neutral or indexed fiscal policy from 2010 for the sustainability of government debt would have been dramatic. The debt-GDP ratio would have risen steadily to peak at roughly 145 per cent of GDP from 2014 onwards. (Figure A2.3). The deficit would have stayed around 10 per cent of GDP out to 2020 (Figure A2.4). With the labour market effectively close to equilibrium by 2020, this would have implied an ongoing structural deficit of the order of 10 per cent of GDP. The direct additional dead-weight costs of the no austerity option imply an additional 2 percentage points of GDP would have been absorbed in debt interest payments by 2018 (Table A2.1).

FIGURE A2.4 Alternative Scenarios for Deficit-GDP Ratio
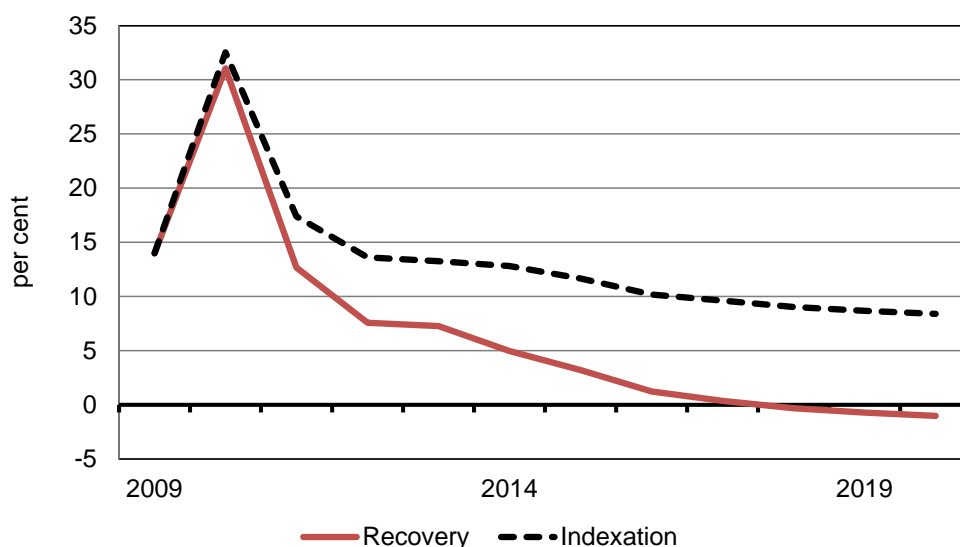
This simulation makes clear the fact there was no choice but to undertake a fiscal adjustment along the lines we have seen implemented since 2009. Even if funding had been available to postpone the adjustment, the costs of delay would have been huge, reflecting the exceptional interest rates that would have been charged on any funding that might have been available. In practise, as we saw in the autumn of 2010, funding was not available at any realistic interest rate, so that the fiscal "indexation" option was not a feasible option, even if the government had wished to exercise such an option.

This simulation does, however, show that the effect of the tough fiscal adjustment over the last five years has been to knock nearly 1 percentage point a year off the growth rate in 2010-2013. The effects were particularly severe on domestic demand and, as a result, the unemployment rate is 2 percentage points higher than it would otherwise have been. This suggests that in future years, when the contractionary fiscal policy ends and deleveraging is complete, a more robust response from domestic demand can be expected, adding to growth.