The Dutch labour market during the Great Recession

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Summary and conclusions

The two phases in labour market response to the Great Recession

The Dutch labour market response to the Great Recession can be characterised by two distinct phases. In the early phase, the rise in unemployment was relatively mild, but after the “double dip” in 2012, unemployment accelerated rapidly. The limited response of employment in the Netherlands in the early phase of the crisis was primarily caused by labour hoarding, mostly fuelled by the tight labour market before the crisis and substantial financial reserves. In addition, the increased share of self-employment was also a channel by which the employment impact of the Great Recession was cushioned. The self-employed most likely absorb a slowdown in aggregate demand via lower income instead of registering as unemployed.

It would be obvious to attribute the strong rise in unemployment in the second phase (from mid 2011 onwards) to a catch-up of delayed layoffs from the first phase of the recession. Although the number of layoffs increased in 2012 and especially 2013, we cannot tell whether all delayed layoffs were caught up and additional research is needed. We do have evidence, however, that labour supply effects have been particularly important for the strong rise in unemployment in the second phase. Unemployment rose more than expected due to relatively high numbers of labour market entrants and fewer exits from the labour force by older workers.

Permanent effects?

Permanent damage to the labour market would arise when high cyclical unemployment causes structural unemployment to rise (so-called “hysteresis” in unemployment) or when labour supply decreases permanently. For the Dutch case, we do not find much evidence in favour of hysteresis in unemployment or permanent decreases in labour supply. Structural unemployment levels are mainly determined by institutional factors. Structural unemployment has declined substantially since the 1980s. Since then, policies were undertaken to reduce benefit dependency: replacement rates have been brought down and unemployment benefit durations have been shortened; active labour market programmes have been implemented for all kinds of benefit schemes and the tax system has been reformed in order to make work pay for all, with special incentives for specific groups. All these factors have lowered the Dutch structural unemployment level and there is limited ground to believe that the Great Recession has altered this level in a substantial way. Thus, the Dutch structural unemployment level will most likely remain at a relatively low level vis-à-vis other countries and compared to the past.

Likewise, there is little evidence to expect permanent negative labour supply effects from the current crisis. The groups that are mostly susceptible to permanent losses are younger and older workers. For the young, there are currently no signals of increased risks of a lower future labour market attachment. Their long-term unemployment is relatively low. For older workers, there are indeed indications of permanent discouragement, but the current cohorts of old discouraged workers will retire in the near future. Hence, no long-term negative labour supply effects are expected. What is important as well is the fact that
Dutch labour market institutions are calibrated towards activation of the potential labour force. Routes to non-participation from the past, such as generous disability benefits or early retirement schemes, have been made financially less attractive over the past decades. This reduces permanent flows from the labour market to non-participation.

Permanent changes in employment are not so much related to the crisis, but more to structural shifts in the sectoral and occupational structure. These are the result of technological change and off shoring. These shifts are apparent in the Dutch case, but relatively small in an international comparison. There is no evidence that these changes enhanced during the crisis. But more research is needed to determine the specific groups that are at risk due to structural shifts.

**Speed of recovery**

Unemployment is the result of two opposing forces of labour demand and labour supply. Unemployment will recover slowly in the aftermath of the Great Recession if employment is slow to recover, or if labour supply recovers quickly. The speed of recovery of labour demand will depend first and foremost on the recovery of aggregate demand through exports and consumption. If these factors recover, then labour demand will most likely follow with some time lag. Employment growth usually lags behind GDP growth by approximately half a year, since firms do not immediately open new vacancies if demand increases. In addition to the usual lag between the GDP recovery and the employment recovery, we cannot exclude the possibility of a longer period of jobless growth. There are several reasons why this might occur. First, wages may not decline enough to absorb both the decline in labour productivity and the high unemployment rate. Second, firms may still have some redundant employees in their workforce (some labour hoarding may thus still be apparent). Third, the number of jobs might be low in the transition phase of structural shifts between occupations or sectors. Fourth, confidence in a strong recovery among firms will remain low for some time. In all cases, labour market adjustments will probably take more time and employment will most likely lag further behind GDP recovery.

Labour market institutions are important for the speed of recovery of labour supply. We have emphasised that Dutch labour market institutions are currently stimulating participation. Replacement rates are not high when compared to other countries; maximum durations of unemployment benefits have been shortened, policy reforms have been adopted to stimulate disabled people to go back to work, early retirement schemes have been abolished, income taxes provide incentives to work and active labour-market policies are used extensively to get people into a job. What remains to be seen is the extent to which institutions will stimulate discouraged workers to return to the labour market. On the other end of the spectrum, the reaction of added workers will be important as well. Labour supply might be pushed further upwards by the financial aspects of the crisis (declining housing wealth, credit constraints, deleveraging by households).
1 Introduction

The Dutch labour market has suffered severely from the Great Recession. Unemployment has increased substantially, from 3.1% in 2008 to 7.2% early 2014. We have to go back almost twenty years to observe a similar rate. Currently, over 600 thousand people are unemployed. One third of all unemployed have been unemployed for over a year. Before the crisis, the Netherlands had one of the lowest unemployment rates. Compared to many of its Northern European peer countries, the Netherlands has witnessed stronger unemployment growth. The unemployment level is now on par with or even above that of its peers. This paper documents and interprets what has happened on the Dutch labour market during the Great Recession, and examines the implications for the recovery from the crisis. It serves as a background paper to the labour market chapter in the CPB book “Road to Recovery” (Gelauff et al., 2014). In comparison with the book chapter, this paper provides additional information in several ways. First, the paper discusses the technical details of certain analyses presented in the book. Second, this paper contains more in-depth literature overviews. Third, the paper elaborates to a further extent on the institutional settings and policies relevant during the crisis, such as short-time working schemes. Fourth, the paper provides more international comparisons on certain aspects of the Dutch labour market.

Changes in unemployment are the result of two forces: developments in labour supply and employment. To grasp what happened to unemployment, we must therefore understand what happened to these two underlying entities. The Dutch labour market has witnessed two distinct phases during the Great Recession. In the early phase of the crisis, the rise in unemployment was relatively mild, but after the “double dip” in 2012, unemployment accelerated rapidly. It appears that the slow decline in employment was responsible for the relatively mild unemployment response in the early phase of the crisis. In the second phase, employment did decline, which raised unemployment. However, the unanticipated part of the substantial increase in unemployment during the second phase was especially due to excessive labour supply effects; large numbers of people entered the labour market from the non-labour force.

Economic downturns can result in permanent damage from high unemployment levels or from large numbers of discouraged workers. In this paper we elaborate on the possibility of permanent damage on the Dutch labour market and the factors that are important for the speed of recovery after the Great Recession. Chapter 2 identifies the factors on the labour demand side. It identifies labour hoarding and self-employment as important mechanisms for the employment reaction to the crisis and discusses to what extent structural employment changes are expected in the Dutch case. Chapter 3 investigates labour supply mechanisms that are at play during recessions. It determines the factors that are important for added and discouraged worker effects, the dominance of either of the two and their structural effects. Chapter 4 examines the unemployment patterns in detail and examines the probability of “hysteresis” in unemployment, i.e. the risk that high cyclical unemployment becomes structural.
2 Labour demand

2.1 Introduction

Dutch employment declined slowly during the first phase of the crisis, but the decline accelerated substantially in 2012 and 2013. The slow employment response raises a number of questions. Why did employers hold on to their personnel, despite the severe demand shock in 2008? Which factors explain the employment development during the crisis? How will these factors affect employment recovery after the crisis? Our aim in this chapter is to understand how Dutch employment has reacted to the crisis and to contemplate how it will recover in the years to come.

Section 2.2 gives a description of Dutch employment over a long time period, with a special focus on the Great Recession. Section 2.3 focuses on the atypical response of employment in the early phase of the crisis (2008-2011). Section 2.4 discusses the implications for the recovery phase. In Section 2.5 we discuss the secular trend of sectoral and occupational restructuring and the extent to which this may affect the recovery of employment after the crisis.

In this chapter we define employment as the labour volume in full-time equivalents. In principle, one can measure employment in hours or in persons employed. The number of persons employed is an important measure, since unemployment is expressed in persons (i.e. labour supply minus the number of persons employed) rather than hours. But solely focussing on the number of persons employed does not provide a good overall picture of employment, since people have different working hours. In the Dutch case this is even more important than in many other countries, due to the high prevalence of part-time work. For us, that is the reason why we focus on employment in full-time equivalents.\(^1\)\(^2\)

2.2 Employment in the Netherlands

The employment loss due to the Great Recession is substantial (Figure 2.1). In 2008 the employment rate reached an all-time high of 68.5%. Due to the Great Recession, this rate declined to 66% in 2013, which implies a loss of approximately 222 thousand full-time equivalents.

Although total employment declined, self-employment actually increased by about 98 thousand full-time equivalents (Figure 2.1). This increase partly reflects displaced workers re-entering the labour market as self-employed, but it also relates to a structural trend of growing self-employment, which already started before the crisis (Bosch et al., 2012).

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\(^1\) For international comparisons, however, we have to resort to using employment measured in persons employed due to data availability.
\(^2\) The number of full-time equivalent is calculated by converting all full-time and part-time jobs to full-time jobs.
Figure 2.1 Employment of employees and self-employed in full-time equivalents.

Source: Statistics Netherlands.

The employment pattern in the first phase of the Great Recession resembles that of some of our Northern-European peers, but there are also countries where the employment reaction in the first phase was much stronger. Just like Germany and Austria, the decline in employment was mild in 2008 and 2009. In other peer countries, such as the US and Denmark, employment reacted stronger to the decline in production.

Figure 2.2 Persons employed in the Netherlands and peer countries.


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3 These countries are identified as peers because they all have a low level of structural unemployment in combination with a high level of labour productivity per hour. Structural unemployment is measured by the Non-Accelerating Inflation Rate of Unemployment (NAIRU) of the OECD. The threshold value is set at the OECD average of 7.1%, based on observations in 2013. The level of labour productivity is based on the Total Economy Database of the Conference Board, with a threshold value of $50 per hour in 2013. Iceland, Luxembourg and Norway are left out of the comparison, to simplify the benchmark analysis.

4 German employment hardly declined during the crisis. Explanations can be found in the timing of labour market reforms in the early 2000s or specific elements of the crisis, such as short-time work schemes and the absence of a housing crisis. We will return to explanations of the German “labour market miracle” in more detail in Section 2.3.1.
The employment pattern changed in the second phase of the Great Recession, starting mid 2011. Except for Denmark, all peer countries experienced a recovery of their employment levels in 2012 and 2013. Dutch employment, however, continued to decline. This is partly due to the fact that the Netherlands experienced a second decline in GDP (the so-called “double dip”), something that was absent in many of the peer countries. In addition, the decrease in employment in the second phase may be the result of a catching-up process of delayed lay-offs in the first phase of the recession.

2.3 The lag between GDP and employment in the early phase of the crisis

Employment typically lags behind changes in GDP. The size of this lag differs between countries. In the three European countries in Figure 2.3, employment lags behind GDP for about a year, but for the US no such pattern is eminent. This is especially clear in 2009, when GDP declined strongly in all countries. Only the US witnesses a sharp employment decline in the same year.

![Graph of Employment growth (persons employed) and GDP growth in the Netherlands, Germany, US and UK](image)


The other countries show remarkable different employment reactions to the GDP decline in 2009. The differences reflect country-specific institutions, but also crisis-specific elements play a role, such as the absence of a housing market crisis in Germany (compared to, e.g., the Netherlands). The slow decline in employment levels at the onset of the crisis could be explained by labour hoarding, possibly encouraged by employment protection legislation (EPL) and a decline in real wages. Next, the increased importance of self-employment on the Dutch labour market could be a factor that cushioned the employment reaction. In the next section we examine how these mechanisms can explain the observed pattern in the Dutch employment response.

2.3.1 Labour hoarding

In continental Europe, a decline in aggregate demand usually does not directly translate into work force reductions. Firms often decide to retain their workers, even if there is little to no productive work available for all workers. This behaviour is known as labour hoarding (Hamermesh, 1993). Labour hoarding is an important explanation why total employment adjusts slowly to GDP declines in many European countries (OECD, 2010).
Even though it is impossible to observe labour hoarding directly at the macro economic level, there are clear indications that many Dutch firms hoarded labour, especially during the first phase of the Great Recession. Surveys among employers indicate that almost 75% of firms that faced a severe drop in demand in 2009 did not lay-off workers proportionally (Intomart, 2010; Van der Ende et al., 2010a,b). Another indicator for labour hoarding is the decline in labour productivity. As workers are retained, the average production per worker drops and as a result labour productivity falls.

While Dutch GDP declined by 3.7%-points in 2009 – by far the largest decline in 30 years – employment in full-time equivalents declined by only 1%-point. By implication, labour productivity suffered severely. For the first time in 30 years labour productivity fell by 2.3 percentage points in 2009 (Figure 2.4), while the employment decline remained limited compared to earlier recessions. In short, the initial demand shock late 2008 was absorbed through productivity losses rather than via changes in employment. This supports the labour hoarding hypothesis. This pattern differs from earlier recessions. In the (less severe) recession in the early 2000s (ICT crisis), Dutch labour productivity increased, while employment in full-time equivalents dropped. In the quite severe recession in the 1980s employment declined strongly, while labour productivity continued to increase.

The most prominent reason for labour hoarding lies in the important role of transaction costs in firms’ decision making. Firms that do not expect a long and severe production slowdown, expect to fully reallocate their workers when demand picks up again. Labour hoarding enables firms to hold on to workers with important firm-specific skills and avoid the inevitable transaction costs related to laying-off personnel and hiring new workers some time later. For many firms, it is cost efficient to hoard labour for this reason.

In general, employment protection legislation (EPL) is an important element of these transaction costs. EPL is therefore an important reason why we observe more labour hoarding behaviour in European countries than in e.g. the US and the UK. Since strict employment protection raises transaction costs, e.g. by imposing severance payments, it
makes firms reluctant to adjust their workforce immediately in response to changes in product demand. While the strictness of EPL for permanent contracts in the Netherlands is above the OECD average, as it has been for a long time, employers hardly ever mentioned EPL as a motive to hold on to redundant employees during the Great Recession (Josten, 2011 and Van der Ende, 2010b). The high prevalence of temporary contracts may be important in that respect (see Section 2.3.2).

There are three factors specific to the Dutch Great Recession that reinforced labour hoarding. First, employers had optimistic expectations regarding the duration and depth of the slump (De Jong, 2011). Second, employers struggled to find appropriate personnel in the tight labour market prior to the crisis. Indeed, the vacancy-to-unemployment ratio was very high in 2008. Third, high private profits in the years before the crisis resulted in considerable financial buffers of firms, which allowed them to pursue the labour hoarding strategy (Van der Ende et al., 2010a,b; Josten, 2011; De Jong, 2011; Verbruggen and Hindrayato, 2013).

Labour hoarding was not a specific Dutch phenomenon, but its impact on productivity was stronger than in other countries. Figure 2.5 shows an international comparison of the GDP bust at the peak of the crisis in 2009, broken down by its components: employed persons (orange bars), hours worked (dark blue bars) and labour productivity per hour (light blue bars). In the Netherlands, roughly one-fifth of the drop in GDP was due to a fall in employed persons, and 15% can be attributed to a decline in hours worked per person employed. Thus, the main part of the decline in Dutch GDP was absorbed by a decline in productivity per hour worked.

Figure 2.5 Decomposition of GDP in 2009, contribution of components in percentage points

![Figure 2.5](image)


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EPL also makes firms more reluctant to immediately hire new workers when product demand increases. As a result, EPL lowers the volatility of employment over the business cycle (e.g. Nickell, 1978; Bentolila and Bertola, 1990; Blanchard and Wolfers, 2000; Bassaninini, 2012).
In other countries the response of the labour market was more prominent, either via a substantial reduction of hours worked (e.g. Japan, Germany, Austria and Belgium) or by a reduction of persons employed (e.g. Denmark, Sweden, Portugal and the US). In some countries, the contribution of both labour market components were mixed (Italy, the UK and France), but together still contributed to a far larger extent to the GDP loss than the Dutch labour market did.

**Labour hoarding and short time working schemes**

Germany is an interesting example where labour hoarding played a different role than in the Netherlands. In Germany, high-productivity export-oriented manufacturing industries were hit hard by the crisis. These sectors experienced skills shortages in the years before the crisis. As was the case in the Netherlands, skills shortages provided incentives for employers to hoard labour. In contrast to the Netherlands, German labour hoarding ended up in fewer hours worked and not so much in lower labour productivity (Figure 2.5). Working-time accounts helped to curb the employment response in Germany by reducing working hours. This was further facilitated by short-time working schemes (STW), which were heavily used during the crisis (Burda and Hunt, 2011).

Short-time working schemes aim to prevent layoffs during a recession by providing employers with a (temporary) wage costs subsidy. The German STW-scheme (so-called Kurzarbeit) was already in place before the crisis, but it was made much more attractive in the beginning of the crisis. It was heavily used by the export-oriented manufacturing industry. For example, one in three workers in metal production faced a reduction in working hours in 2009.

Germany is an example where STW schemes were quite successful in preventing unemployment (Hijzen and Martin, 2013 and Hijzen and Venn, 2011), even while one fourth to one third of the use of STW in Germany did not save any jobs due to so-called deadweight loss (OECD, 2010, p. 72; Boeri and Bruecker, 2011, p. 729). Some employers and sectors benefited from the subsidy, whilst never planning to lay-off employees in the first place (Brenke et al., 2011). German production did pick up rather quickly after the initial slump in 2008/9, especially in the high-productivity export-oriented manufacturing industries. As a result, the short-time working schemes did exactly what they were supposed to do. The hoarded labour was put to productive use when production accelerated again.

The Netherlands also had two short-time working schemes in the early phase of the crisis, but these were much less successful. One way to obviate measurement problems related to deadweight loss is by comparing firms that used STW schemes with a suitable control group of otherwise similar firms that did not use the subsidy. De Groot et al. (2012) use exactly such a quasi-experiment for the Netherlands and find no significant net effects of the two short-time working schemes on firms' employment levels and worker turnover. This conclusion is in accordance with findings by Hijzen and Venn (2011), who calculate that STW schemes in the Netherlands saved only 5,000 to 6,000 full-time jobs during the first years of the crisis. Also, De Jong (2011) shows that STW lowered unemployment by at most 0.1 to 0.2 percentage points.

**2.3.2 Temporary workers and the self-employed**

The number of temporary work and self-employment has increased strongly over the past ten years (Figure 2.6). The share of regular contracts in total employment is now only 70%, while temporary contracts and self-employment are both approximately 15% of employment. These two elements of labour market flexibilisation play an opposite role in the employment reaction to the crisis.

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6 For this figure we have to rely on survey data from the Dutch Labour Force Survey, because the national accounts do not distinguish between type of contract. This means that the developments might differ from those presented in earlier figures, where we relied on the national accounts.
Temporary contracts speed up employment adjustments, since they reduce transaction costs: temporary contracts can be terminated without costs. As a result, employment of temporary workers is about twice as sensitive to business cycle movements as regular employment (OECD, 2010). The Netherlands is no exception to this rule. According to the Dutch Labour Force Survey (Statistics Netherlands), temporary employment (measured as number of persons with a temporary contract) dropped by 4.5 percent in the period 2008Q4-2009Q4, while regular employment declined by 1.8 percent. This implies that the employment response fell disproportionately on temporary workers.

Self-employment on the other hand, cushioned the impact of a reduction in labour demand on employment, especially in persons. Self-employment increases the flexibility of the labour market by providing firms with the opportunity to outsource work to self-employed workers during an upswing, and to scale down during a downturn without the costs.
associated with EPL. But the self-employed do not register as unemployed easily. Instead they cushion the effect of the slowdown in activity by means of lower income (OECD, 2012). Lower demand translates partly in declining tariffs of self-employed, but especially in less chargeable hours as a result of fewer or smaller assignments. Indeed, in 2009 average income declined by about 13% (Figure 2.7). The cumulative decline from 2009 to 2012 was 16%.

2.3.3 Real wages

Another reason for a mild adjustment in labour demand after the severe drop in aggregate demand is that, given the current level of employment, real wages have declined to a sustainable level. If demand for labour falls, both quantities and wages are under pressure, which leads to a trade-off between wage adjustments and employment losses. If wages are adjusted downward, unemployment will rise more slowly (Bakker and Zeng, 2014). In the Netherlands, nominal wage growth has slowed down in 2009 and real wages have declined since 2010 (Figure 2.8, left-hand side).

Figure 2.8 Percent change in real and nominal wages (left) and the development of real total wage costs and labour productivity (right) in the Netherlands.

However, real wage costs have kept pace with the developments in productivity (Figure 2.8, right-hand side). This is partly due to increased employers’ social contributions resulting from fiscal austerity. This means that the downward pressure from rising unemployment was not fully absorbed in the wage costs. Therefore, while declining real wages facilitated labour hoarding for firms, this was partly offset by rising social contributions for employers. This means that most of the labour market adjustment to the crisis has been in terms of quantities rather than wages.

2.4 The lag between GDP and employment in the recovery phase

The speed of recovery of labour demand will depend first and foremost on the recovery of aggregate product demand via exports and consumption. When these factors recover, then labour demand will most likely follow with some time lag. Employment growth usually lags behind GDP growth by approximately half a year, since firms do not immediately open new

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7 Primary income includes income from labour, self-employment and assets.
vacancies if demand increases. Even if firms open new vacancies immediately, it takes a while to hire workers (CPB, 2010, p. 34).

In addition to the usual lag between GDP recovery and employment recovery, we cannot exclude the possibility of a longer period of jobless recovery. There are several reasons why this might occur. First, firms may still have some redundant employees in their workforce (some labour hoarding may thus still be apparent). Second, wages may not have declined enough to accommodate both the decline in productivity and the high unemployment rate. Third, the number of jobs might be low in the transition phase of structural shifts between occupations or sectors. Fourth, firms might not be confident that the recovery of the economy will be strong. In all cases, labour market adjustments will likely take more time and employment will probably lag further behind GDP recovery. Below, we elaborate on the first three issues.

2.4.1 Labour productivity and labour hoarding

Historically, large falls in labour productivity during a crisis are associated with strong increases in labour productivity during the recovery. This suggests that labour hoarding during a recession is indeed associated with jobless growth following a recession (OECD, 2010, p. 76). If there is still labour hoarding at the end of the recession, employment will recover slowly, because firms still have a backlog of workers who can be more productive, both in doing more productive work and in increasing their number of hours (OECD, 2012, p. 104). However, if productivity remains low due to other reasons, there is no reason employment should not pick up at a quicker pace.

Another reason for the decline in labour productivity during a downturn might be that less productive firms increased their labour shares at the expense of more productive firms. The evidence on the importance of this mechanism is mixed. Some researchers suggest that it actually works the other way around, i.e. changes in employment between firms lead to counter-cyclical movements in labour productivity (Baily et al., 2001). But others suggest that, especially during a credit crunch, smaller, more productive firms face a credit constraint and have to reduce employment relative to larger, less productive firms (Buera et al., 2014).

We know that productivity has declined sharply during the crisis that labour hoarding was important at least in the early phase of the crisis and we know that productivity has not shown many signs of recovery (Gelauff et al., 2014, Chapter 4). The difficulty is that we have little information on the causes for the current low levels of productivity (see Gelauff et al., 2014, Chapter 4). We cannot tell whether labour hoarding is still present. After the second dip in 2012, the employment response was still limited, but in 2013 the contribution of layoffs sped up (Figure 2.9). This suggests that firms have ceased to hoard labour in the second phase of the crisis, but is unclear to what extent labour hoarding is widespread among firms.

8 The contribution of employment to the GDP decline was larger than productivity or hours worked.
2.4.2 Wage developments

Dutch real wage costs have developed more or less in line with labour productivity since 2008. They have not fully absorbed the increase in unemployment (Figure 2.5). As long as wages are relatively high, the probability of a jobless recovery is high as well. Firms will be more reluctant to hire new workers if wages are above their equilibrium value. Comparisons with the 1980s show that the current situation is not quite as severe as it was back then. In the 1980s real wages had not even absorbed the productivity slowdown, let alone the increase in unemployment.

There has been an upward pressure on wage costs due to increased social contributions.
2.4.3 Occupational restructuring and job polarisation

Job polarisation is an important secular trend that also determines future labour market developments, even if it is not related to the Great Recession itself. Over the past twenty years occupations in the middle of the skill distribution have declined, while occupations at the low and high end of the spectrum grew. This phenomenon has been referred to as job polarisation (Goos and Manning, 2007). It has been clearly demonstrated for the US labour market (Autor, Katz and Kearney, 2006; Autor, 2011; Autor and Dorn, 2013) and there is strong evidence for many European countries as well (Goos, Manning and Salomons, 2012).

Figure 2.11 Changes in the share of the wage bill for low middle and high educated workers for the period 1980 - 2004.

The main drivers of the changes in the structure of employment are technological change (ICT, automation), outsourcing, offshoring and labour market institutions that affect the relative wages between groups. While many European countries indeed experienced strong employment shifts in the past twenty years, the Netherlands actually experienced relatively little polarisation (Figures 2.10 and 2.11; Akçomak et al., 2011).

Occupational and sectoral restructuring might be related to the business cycle. Firms might use the opportunities provided by necessary layoffs to change their production structure. For example by automating several tasks or outsourcing elements of their production. As such, job polarisation could be responsible for the large employment losses in some countries during the Great Recession. The current literature on this hypothesis finds mixed evidence for the US. Jaimovisch and Siu (2012) argue that a decline in routine jobs accounts for most of the jobless recoveries since the 1990 recession, while Foote and Ryan (2012) show that workers across the skill spectrum were hit by recessions. Tüzemen and Willis (2013) find that changes in employment shares by skill level have both a trend and a structural element.

There is some evidence that polarisation increased during the crisis in Europe, but it is unclear whether the European averages are driven for example by Southern European countries that experienced large employment losses (Goos, Salomons and Vandeweyer,
2013). Figure 2.12 shows employment changes in Dutch occupations before the crisis (on the horizontal axis) and during the crisis (on the vertical axis). The dots represent different occupations and the size of the dots illustrates the share of the occupation in total employment in 2001, while the colour of the dots exemplifies the dominant education level in the occupation. If changes before and during the crisis are the same, the dot lies on the 45° line. Since most occupations are on or close to the 45° line, this means that changes in employment shares during the crisis are mostly in line with changes before the crisis. This suggests that most occupations were hit proportionally by the crisis. Declining occupations include general managers, clerks and secretaries, while increasing occupations in the middle segment include shop salesmen and personal care workers. This suggests that 'the middle' is actually highly heterogeneous and further research is needed to understand which specific groups are at risk.

Figure 2.12 Changes in employment shares of all occupations in the Netherlands before and during the crisis, categorized by their shares of low, middle and high educated.

Notes: The size of the bubbles illustrates the share of the occupation in terms of number of persons per occupation in total employment in 2001.
Source: Dutch Labour Force Survey (Statistics Netherlands), own calculations.

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10 Low educated occupations are defined as those occupations where more than 50% of the employees have a VMBO, MBO1 or AVO diploma in 2001. High educated occupations are defined as those occupations where more than 50% of the employees have either HBO or WO education in 2001. Middle occupations encompass all other occupations.
3 Labour supply

3.1 Introduction

Since the onset of the financial crisis in 2008, the Netherlands has witnessed an increase of its labour supply by about 185,000 persons. This increase is largely structural by nature. Despite the increase, actual labour supply moves below its structural path because the Great Recession induced people to withdraw from the labour market. We know from experiences in other countries and other recessions that business cycle effects can lead to substantial deviations from the structural trend.

In this chapter, we explain the Dutch labour supply developments during the Great Recession and examine the expectations for the aftermath of the crisis. Will labour supply return to its long-term growth path or will the current downturn inflict permanent damage to labour supply? In Section 3.2 we disentangle structural and cyclical labour supply and discuss how the Dutch cyclical labour supply responded to the Great Recession. Section 3.3 focuses on the added worker effect and Section 3.4 on the discouraged worker effect. Section 3.5 discusses the probability of permanent damage to labour supply in the aftermath of the Great Recession.

3.2 Labour supply developments

3.2.1 Structural and cyclical labour participation

Labour supply has grown since the beginning of the Great Recession. This increase has been largely driven by structural factors, such as the structural increase in labour force participation (the dark blue line in Figure 3.1 (left)) of women and older workers and to a lesser extent to population growth. The abolishment of early retirement schemes and the subsequent shift in social norms about employment participation of older workers led to a substantial increase in the participation rates of older workers. The increase in female participation was driven by increasing education levels and shifting social norms. As a result, young women who enter the potential labour force have higher participation rates than the older women who reach the retirement age (CPB, 2014b).

Actual labour supply (orange line in Figure 3.1 (left)) always deviates from its structural growth path due to business cycle fluctuations. The cycle influences both the necessity and the attractiveness of (looking for) work. The net effect of the cycle on labour-force participation is not clear from a theoretical point of perspective, because two opposing effects are at play: the added worker effect and the discouraged worker effect. The added worker effect entails that household members outside the labour force will look for a job when faced with a reduction in household income (e.g., when their partner loses his/her job) in order to avoid a severe drop in income. The discouraged worker effect entails that job seekers are discouraged when they are confronted with poor job finding opportunities, and as a result leave the labour market.

Figure 3.1 (left) suggests that up to now discouraged worker effects have dominated added worker effects, as actual labour supply moves below its structural path. The methodology that we used to determine structural labour supply (and by implication cyclical labour, supply as it is the difference between actual and structural labour supply) is described in Appendix 1. Labour supply currently lies about 1% below its structural trend (Figure 3.1, right).

### 3.2.2 Labour supply response to the Great Recession less severe than expected

As mentioned above, the discouraged worker effect has dominated the added worker effect, like it does in most recessions in most countries. But the Great Recession is a very severe one, so we might have expected an even bigger decline in labour supply than we have actually observed up till now. Hence, we have to compare the actual loss in labour supply to the expected cyclical participation loss, given the severity of the crisis. In this section we use results from the analysis conducted by Duval et al. (2011) to determine the ‘regular’ labour supply reaction to the Great Recession.

Duval et al. (2011) measure the response of cyclical labour force participation during downturn episodes for a panel of 30 OECD countries over 1960-2008. They distinguish three types of crises:

1. A moderate crisis: the peak-to-trough change in the output gap is between 3 and 6 percentage points.
2. A severe crisis: the peak-to-trough change in the output gap is between 6 and 9 percentage points.
3. A very severe downturn: the change in the output gap is more than 9 percentage points.
Results by Duval et al. (2011) indicate that moderate downturns have no statistical significant effect on cyclical participation. Severe downturn episodes lead to a negative labour supply effect that peaks at about minus 1.5 percentage points five years after the preceding cyclical peak. For very severe downturn episodes, the maximum decline is about 2.5 percentage points five to eight years after the preceding cyclical peak. The estimated paths of participation loss from Duval et al. for severe (blue line) and very severe downturns (green line) are applied to the Dutch case in Figure 3.2.

Figure 3.2 Participation effects (measured in persons) of two types of downturns

Source: Duval et al. (2011) and own calculations.

According to the definition used by Duval, the Dutch Great Recession can be characterised as a severe recession: the output gap decreased by 8.3 percentage points from the preceding peak in 2008 to the trough. But this value is closer to the threshold value of a very severe crisis (> 9 percentage points output gap loss) than the lower boundary of a severe crisis (a 6 percentage points output gap loss), making an expected cyclical participation effect somewhere in between a severe and very severe downturn plausible.

The actual Dutch cyclical labour supply pattern (orange line in Figure 3.2)\textsuperscript{11} deviates substantially from the predictions based on the Duval estimates, especially in the second phase of the crisis. During the first phase of the crisis (up till mid-2010), the decline in cyclical labour participation in the Netherlands amounted to roughly 150,000 persons, which is roughly in accordance with the “very severe downturn” pattern. But while a further decline would be expected according to the estimates by Duval, actual cyclical labour participation was rather stable from mid-2010 onwards. This either implies that fewer people withdrew from the labour market than expected, or that more people were added to the labour force than expected.

\textsuperscript{11} The cyclical component in labour participation is derived by using CPB calculations of trend growth in the Dutch participation rate. The structural participation rates are calculated by applying an HP-filter technique on the realised participation rates by age and gender over the period 1987-2013 (see Appendix 1).
3.3 Added worker effects

The Netherlands has witnessed a substantial inflow of people from non-participation into its labour supply in the period from mid-2011 and mid-2013 (Figure 3.3 and Van Loon et al., 2014). In this section we try to identify the reasons for this substantial inflow. It might be caused by losses in housing wealth, rising unemployment (probabilities) of spouses or a high overall level of uncertainty, stimulating people who were not previously active on the labour market to search for a job. Or it might be postponed labour market entrance of school leavers who chose to continue their studies in the early phase of the crisis.

Figure 3.3 Changes in inflow from non-participation into unemployment (orange) and into employment (blue), measured in persons

Source: Statistics Netherlands. The figure depicts year on year changes in the inflows.

3.3.1 Added workers in the international literature

From a life cycle perspective, households that are faced with negative shocks in wealth or income, can increase their labour supply to smooth life time consumption. For example, if one household member becomes unemployed or faces job loss, other household members can either start looking for work or extend their working hours (Mincer, 1962; Lundberg, 1985). Traditionally, research on added workers focused on participation decisions. More recently, due to the rise in female labour participation, studies on the added worker effect also focus on hours worked (e.g. Stephans, 2002; Bryan and Longhi, 2013).

The early literature has in general found no evidence for added worker effects. The reason for this is probably related to their use of cross section data. Since the use of panel data, the added worker effect has been found to be both real and significant. Empirical studies mainly focus on added workers effects in the strict sense, i.e. individual participation.

\[\text{In the theoretical literature, the added worker effect is mostly studied in life cycle models for households. These models describe how forward looking households set their consumption and labour supply decision in order to maximise their life time utility (Heckman and Macurdy, 1980; Blundell and Walker, 1986).}\]

\[\text{To study the added worker effect empirically, one needs to rely on panel data. Since individuals generally marry with people of the same educational level and unemployment probabilities are highly correlated to educational levels, cross-section data typically show a negative effect of unemployment on the probability that the partner is in work. As a result, the absence of added worker effects in older studies such as Layard et al. (1980) and Maloney (1991) do not imply that added worker effects do not exist.}\]
decisions in case of a partner’s job loss. Estimates vary from an increase in the labour supply of 2-11 percentage points after the partner’s job loss (Stephens, 2002; Bryan and Longhi, 2013; Juhn and Potter, 2007). The study by Stephens (2002) is especially interesting. He analysed the labour supply effect for women whose partner lost his job in the United States in the period 1968-1992. According to his estimates, male job loss leads to an average increase in annual hours worked of 108 hours (11%) by their partners.

The severity of the business cycle affects the magnitude of the added worker effect (Bryan and Longhi, 2013; Juhn and Potter, 2007). Credit restrictions and longer unemployment spells might be the cause for a stronger added worker effect in times of crisis. The 2%-point increase in the participation rate found by Bryan and Longhi (2013) is a lower bound and holds for a period of good economic performance. In the severe recession of 2008-2011, the estimated effect by the same authors was much bigger (8%-point). Similarly, Juhn and Potter (2007) split their data set (1968-2005) with US data into periods of downturns and upswings. In times of economic expansions, they find a 5.6%-point higher chance for non-participating women with unemployed husbands to enter the labour market, compared to women with a working husband. In recessions, the difference amounts to 9.1%-points.

The literature on the effect of housing wealth on household labour supply is scant. Henley (2004) finds evidence that men in the United Kingdom extend their working hours if their housing wealth declines, but the effect is small in size: a decline in housing prices by 10% in real terms leads to an increase of 0.73% in hours worked per week. He does not find significant labour supply responses to declines in housing wealth for women. Furthermore, Benito and Salaheen (2012) study the interaction between credit constraints and financial shocks on labour supply decisions for UK households in the period 1991-2007. They do not find evidence that households with a high loan-to-value or a high loan-to-income ratio are more responsive in terms of labour supply to a financial shock than less constrained households. However, their sample only runs to 2007, thereby excluding a period in which credit restrictions are more stringent.

The extent to which households resort to their labour supply as a means to keep up consumption in the event of a negative income shock depends on their alternatives. One would expect a more substantial added worker effect in response to the partner’s job loss in case of low wealth, strong credit restrictions, long perceived duration of the income shock and limited access to social insurance benefits (Bryan and Longhi, 2013). Furthermore, a long perceived unemployment duration affects the labour supply decision (Cullen and Gruber, 2000). During the Dutch Great Recession housing wealth declined, credit rationing was taking place by financial institutions and the unemployment duration has increased substantially (also see Chapter 4, Figure 4.4). All of these factors point to a high probability of added workers in the Dutch case.

### 3.3.2 Added workers in the Netherlands

The number of added workers is not measured directly in any Dutch data. As mentioned above, data on labour market flows do provide evidence for a large “extra labour supply” in the second phase of the crisis. From mid-2011 to mid-2013, the number of people who
entered the labour market increased substantially. This is an important reason for the relatively mild decrease in labour supply during the Great Recession (see section 3.2.2), but it is hard to label this as an added worker effect in the strict sense. The increase was to a large extent driven by young people aged between 15 and 24 years who were in school or studying and by single households aged 24 years and older. Persons whose partner was unemployed were responsible for only a small fraction of the increase in the flow from non-participation to unemployment (Van Loon et al., 2014).

3.4 Discouraged worker effects

Above, we have shown that labour supply in the second phase of the crisis deviated substantially from the regular pattern during a severe recession. Section 3.3 shows that the increase of labour market entrants played a role of significance, but limited discouragement may also have caused the atypical labour supply pattern.

Figure 3.4 Total discouragement (left) and discouraged workers as % of unemployment (right)

![Graph showing discouragement and discouraged workers as % of unemployment](image)

Source: Statistics Netherlands. The data in both figures were corrected for seasonal effects.

When labour market prospects deteriorate (i.e. the number of vacancies decline and unemployment rises), job finding opportunities become slim and search costs are increasing, which consequently discourages people to actively keep searching for work. In that case, the job search costs of discouraged workers outweigh their expected benefits (Blundell et al., 1998), where search costs involve both monetary and psychological costs (Cahuc and Zylberberg, 2004). During the current crisis the number of discouraged job seekers has increased substantially in absolute numbers (Figure 3.4, left), but was rather stable as a percentage of unemployment since both series moved in tandem (Figure 3.4, right). At the end of 2013 the number of discouraged workers reached about 70,000 persons, which is roughly 12 percent of unemployment and approximately 1 percent of the labour force.

Figure 3.5 shows that people aged 55 and older and low-educated workers are overrepresented in the pool of discouraged workers. People aged 55 and older make up about one third of total discouragement, while they constitute about one eighth of total unemployment. The rate of discouragement of older workers nevertheless seems to be smaller than expected (Erken et al., 2014). The low educated are slightly overrepresented among the discouraged workers as well. They form about half of all discouraged workers, while they make up about 40% of total unemployment.
3.5 Persistent labour supply effects?

Labour supply may be affected structurally by the Great Recession. Discouraged workers can permanently withdraw from the labour market or new labour market entrants might continue working. The first development would induce a negative effect on structural participation levels. This could be the result of a shift in social norms: a high level of long-term unemployment and discouraged workers may, for example, lead to a higher acceptance of benefit dependency. In that case, labour supply will be structurally lower, which also negatively affects welfare in the long term. Alternatively, if early retirement has become more socially acceptable, the same result is achieved. Both of these examples resemble the labour-supply reaction in the aftermath of the 1980s recession. However, as we will argue below, it is unlikely that history will repeat itself.

Furthermore, it is important to make a distinction between persistent and permanent effects. Persistent effects encompass effects that last for a long period of time, but that will be mitigated on the labour market eventually. Some discouraged older workers, for instance, will not return to the labour market, but cohort effects ensure that the effect on aggregate labour supply will only be persistent, not permanent.

3.5.1 Persistence on the individual level

In general, both added worker and discouraged worker effects appear to be rather permanent on the individual level. The added worker effect lasts over time as the new workers remain on the labour market (Stephens, 2002). This may be related to the fact that employment leads to human capital accumulation. Increased work experience makes the partner more productive, which increases the returns of working relative to leisure (Clark and Summers 1982).

Discouragement on the individual level seems to be a permanent state as well, but this is not necessarily related to hysteresis. Discouraged workers have a low probability to make a transition to employment in both economic upswings and downturns. Jones and Riddel

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14 Another reason for increased labour market attachment might be that displacement often has long term negative effects on job earnings (Deelen et al., 2014; Hijzen et al., 2010; Couch and Placzek, 2010). Therefore, household labour supply has to increase permanently to keep up consumption.
(2006) use Canadian data to show that the monthly transition rate of discouraged workers into employment amounts to 10%. That is less than half the job finding probability of the unemployed. In the US, the monthly job finding rate for discouraged workers amounts to 12% (Kodrzycki 2000). An improvement in labour market conditions seems to have a limited response on discouraged workers returning to the labour market (McElhatten, 1980; Jones and Riddel, 1999). Explanations for the weak response of discouraged workers to improved macro economic conditions are related to personal characteristics, like low qualifications and high age (Finegan, 1981; Ham et al., 2001).

Permanent effects on the individual level do not automatically imply permanent effects on the macro level. On the aggregate level, the number of discouraged workers does show a drop when the economic tide improves (See Figure 3.5). This decrease is mostly due to a lower inflow into discouragement (see also Kodrzycki, 2000) in combination with the retirement of the older discouraged workers. So even if discouragement is permanent at the individual level, on the level of the economy this is not necessarily the case.

3.5.2 Persistence on the macro level

Participation effects are the net result of discouragement and added worker effects. Duval et al. (2011) find that severe and very severe downturns have a negative persistent impact on labour participation (see also Section 3.2.2), thus discouragement can be very persistent. Severe downturns have a significant negative effect up to nine years after the cyclical peak (Figure 3.6). Very severe downturns have significant negative effects even ten years after the cyclical peak. At the same time, IMF (2009) finds that financial crises usually lead to an increase in labour-force participation up to seven years after the start of the crisis, similar to mild recessions in the Duval study. The difference between the studies by Duval and the IMF for severe recessions might be due to the inclusion of a few less-developed countries in the IMF sample, which causes the added worker effect to dominate: long-term discouragement is simply no option in these countries. Alternatively, the inclusion of only financial crises in the IMF study may be important here, since not all of them were severe according to the Duval measure (see Section 3.2.2).

As mentioned before, the Dutch labour supply reaction during the Great Recession has been relatively mild given the size of the output gap (see Figure 3.2). This makes the possibility of long-run negative labour supply effects small. In addition, Duval et al. (2011) show that the persistence of labour supply effects depends on institutional and policy settings. Early retirement incentives embedded in old-age pension schemes and other social transfer programmes are found to amplify the responsiveness of older workers’ participation to economic conditions. However, these incentives have been abolished in the Netherlands in the past decade. This reduces the likelihood of persistent discouragement in the Netherlands.

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15 They study whether the large negative labour supply effect of downturns for older workers is related to early retirement schemes by looking at implicit marginal tax rates on the continuation of work by older workers. They find that negative shocks in GDP lead to a larger drop in participation in countries with high implicit marginal tax rates.
The age structure of the discouraged workers also gives no indication that the Netherlands runs a high risk of a persistent negative labour supply effects from the Great Recession. Duval et al. (2011) find that especially young (15-24) and old (60-64) people are susceptible to structural declines in participation. The largest drops are observed in the age groups of 15-19 (-6 percentage points), 20-24 (-4 percentage points) and 60-64 (-4 percentage points). In the Dutch case, nearly two-thirds of all discouraged workers are over 45, and half of those are 55 or older (Section 3.4). Only a minor share of discouraged workers is young. The older discouraged workers will retire from the labour market in due course, so they will not have long-run effects on the level of labour supply.

Figure 3.6  Long-term cyclical participation effects, dependent on the severity of the downturn, cumulative effects in percentage points in years after the start of a recession


3.5.3 Financial aspects

An important characteristic of the current recession is the large loss of housing wealth. On average, house prices have, in real terms, declined 26% since the peak of 2008. Henley (2004) suggests that housing wealth has little impact on labour supply decisions of households. The small impact might suggest that households do not perceive the decline in house prices to be permanent, but transitory.

Next to a fall in housing wealth, pensions have been negatively affected as well. Most pension funds have either provided lower benefits or cut indexation (See chapter 6 of Gelauff et al. (2014)). Therefore, workers near retirement might have postponed their exit from the labour market, instead of lowering future consumption or reducing their bequests. Euwals et al. (2010), for example, show that older workers did postpone their retirement age in response to reforms in early retirement schemes (i.e. a negative shock in pension wealth). As with the effects of housing wealth, we lack data to test the existence and magnitude of the effect. In the long term however, participation responses of older workers to wealth shocks are not expected to be persistent, because they will be outside the potential labour force by then.
Furthermore, due to the financial aspect of the current downturn, credit constraints might be tighter for households, thereby increasing their reliance on labour supply to cope with negative income shocks. However, as stated above, Benito and Salaheen (2012) find no support for this hypothesis. They do not find evidence that households with a high loan-to-value or a high loan-to-income ratio are more responsive to a financial shock in terms of labour supply than less constrained households.

3.5.4 Groups that are especially susceptible to persistent withdrawals

The current downturn is long compared to previous ones. In a long-lasting recession, the unemployed increasingly suffer from skill erosion or even skill obsolescence. This may not only lead to a higher natural rate of unemployment (Chapter 4), but also to withdrawals from the labour market because of discouragement. Duval et al. (2011) show that the old and the young are especially susceptible to persistent withdrawals. However, for both groups we do not expect permanent aggregate effects. Older discouraged workers will be outside the potential labour force in the long run and most young people seem to be working or in education (or both), reducing the risks of a decrease in their future labour market attachment.

For the young, the lack of work experience, build-up of networks and low investments in human capital caused by recessionary periods could reduce their future job finding rates and hence their labour market attachment. Although youth unemployment has risen with five percentage points since 2008 to 11.3% in 2013, the amount of young people not in education, employment or training – the so-called NEET rate – remains low; it still lies below its previous peak of 2005 (Figure 3.7, left). The right figure shows that most young people are either both working and studying (dark blue bars) or are solely in education (orange bars). The latter category has grown at the expense of the former in recent years. The high percentage of young people in education and employment reduces the risk of a decrease in their future labour market attachment.

Figure 3.7 NEET rate by labour market status (left) and not-NEET rates (right)

Source: Eurostat. The left figure depicts the number of people aged 15-24 who are not in employment, nor in education or training as a percentage of the total number of people aged 15-24, by their labour market status: unemployed or outside the labour force. The right picture shows all people aged 15-24 who or either solely employed (yellow) or solely in education/training (green), or who are in both (red). Please note that the bars from the left picture and the bars in the right picture add to 100%.
In addition, the long-term unemployment rate among young people is relatively low (see Chapter 4, Figure 4.4). Furthermore, the literature on scarring effects of unemployment spells for the young finds little evidence for persistent labour supply effects. Graduating in economically bad times has no persistent long term negative impact on young people’s labour supply (Kahn 2010; Oreopoulos et al., 2006). However, these studies only look at labour supply effects of college graduates. There is evidence that female high school graduates who graduated during a severe recession are less likely to participate for some years after graduation (Hersbein 2009). However, these effects fade out after five years upon graduation.

3.5.5 Labour market institutions

Another important difference with previous downturns is the institutional setting, especially when compared to the 1980s. In the past two decades, several reforms were implemented to encourage participation (Vendrik and Görvers, 2009). First of all, current disability benefits are less generous than in the past. Generous disability benefits might be an attractive substitute to unemployment benefits when laying off workers, both to employers and workers. If this is the case, workers withdraw from the labour market rather than become unemployed, thereby lowering participation (Autor and Duggan, 2003). Koning and Van Vuuren (2010) show that by 2002 this discharge route through disability benefits had been greatly reduced in the Netherlands.

Secondly, the option of early retirement has been made financially less attractive. Early retirement schemes in effect impose an implicit tax on continuing working as retirement benefits lead to high opportunity costs of continuing work. Therefore, these schemes together with an adverse demand shock could induce older workers to retire when laid off instead of continuing job search (Duval 2003). So, given past reforms that make the non-participation option financially less attractive and harder to choose, permanent losses of labour supply are less likely to occur in the current downturn.
4 Unemployment

4.1 Introduction

Since the beginning of the Great Recession, in the fourth quarter of 2008, Dutch unemployment has increased substantially and expectations are that the peak has not yet been reached (CPB, 2014a). Unemployment growth has not only been substantial, its timing has been remarkable at various occasions. In the early phase of the crisis, unemployment grew rather slowly, especially considering the depth of the recession. After a phase of stabilisation, when the economy seemed to recover from the Great Recession, the second bust in GDP caused a further increase in unemployment; this time more severely. This chapter examines the unemployment patterns in detail and examines the probability of “hysteresis” in unemployment, i.e. the risk that high cyclical unemployment becomes structural.

4.2 Unemployment in the Netherlands

4.2.1 Unemployment rates and flows during the Great Recession

Due to the Great Recession, the unemployment rate has more than doubled from 3.1% in 2008 to 7.2% in first quarter of 2014. Current CPB forecasts show that unemployment will probably peak in 2014 at a rate of 7½% and that it will start to decline in 2015 (CPB, 2014a). The unemployment response in the early phase of the crisis differs substantially from the unemployment pattern after the second dip (see Figure 4.1).

**Figure 4.1 Unemployment, employment and labour supply**

![Graph showing unemployment, employment and labour supply](image)

Source: Statistics Netherlands.

In the first phase (2008-2011), the relatively mild unemployment response was mainly due to labour hoarding (see Chapter 2). In the second phase of the crisis (2011-2014) supply-side effects were important for the rapid increase of unemployment; this phase is characterized by a mild decline in cyclical participation, given the size of the output gap (see Chapter 3).
During the Great Recession, flows between unemployment, employment and non-participation (people not working and not actively looking for work) have been substantial. Figure 4.2 decomposes unemployment growth into contributions from employment (orange bars) and from non-participation (blue bars). In the period 2008-2009, unemployment growth was mostly due to changes in employment. More people lost their job than unemployed people found work. After mid 2011, unemployment started to rise again. This time, the increase was mainly driven by flows from non-participation into unemployment. This suggests that there was a relatively large flow of unsuccessful entrants into the labour force (e.g. students), which outpaced the discouraged unemployed leaving the labour market. A second wave of layoffs towards the end of 2012 pushed unemployment further upwards (orange bars).

The Dutch unemployment pattern is atypical compared to other countries. Figure 4.3 shows the development of the Dutch unemployment rate vis-à-vis the US and some of its Northern-European peers, i.e. the UK, Denmark, Austria and Germany. The peers are identified as countries with a low the level of structural unemployment in combination with a high level of labour productivity. Before the crisis, the Netherlands had one of the lowest unemployment levels in the OECD. In the first phase of the crisis, until 2011, Dutch unemployment remained far below that of most of its peers. This changed considerably in the second phase of the crisis. In most of the peer countries unemployment stabilised or even declined, while Dutch unemployment experienced a rapid increase after 2011. As a result, unemployment is now on par with or even above that of its peers. In addition, expectations are that Dutch unemployment will continue to rise in 2014, while it is already decreasing in many other countries.

The structural unemployment is measured by the Non-Accelerating Inflation Rate of Unemployment (NAIRU) of the OECD. The threshold value is set at the OECD average of 7.1%, based on observations in 2013. The level of labour productivity is based on the Total Economy Database of the Conference Board, with a threshold value of $50 per hour in 2013. Iceland, Luxembour and Norway are left out of the comparison, to simplify the benchmark analysis.
What is important to note here, is that the Dutch recession is characterized by two subsequent periods of negative growth, while most other Northern European countries did not experience this so-called “double dip”. This might be the reason why these other countries witnessed a (prudent) stabilisation of their labour market in recent years, while the Netherlands did not. The question is whether the current rise fits the nature of the crisis in the Netherlands, or whether there are other factors at play that cause the aberrant Dutch unemployment pattern. Section 4.3 discusses this issue in more detail.

4.2.2 Long-term unemployment

The level of unemployment can be decomposed into long-term and short-term unemployment. Short-term unemployment last less than one year and long-term unemployment more than one year. Long-term unemployment is particularly harmful for individuals’ well-being and their future labour market opportunities. Figure 4.4 shows unemployment broken down in its long and short-run component. The level of long-term unemployment in the Netherlands was less than 1.0% of the total labour force prior to the Great Recession. During the crisis, long-term unemployment has gradually increased to 2.0% by late 2012. After that, it accelerated to 2.7% by the end of 2013.

Especially older workers are hit by long-term unemployment. Younger workers are more often unemployed for a short period. The composition of long-term unemployed by age group in Figure 4.4 (right) reveals that the increase in long-term unemployment is especially prominent among older workers (50 years and older) and the prime-age group (25-50 years). Between late 2009 and late 2013, long-term unemployment among workers aged 50-65 years rose from 1.3% to 3.4%.

Short-term unemployment has developed in a more volatile way: it increased rapidly between late 2008 and mid 2010, and then decreased for a few quarters before starting to rise a second time from mid 2011 onwards. Short-term unemployment was especially
prominent among young workers (15-25 years), reaching more than 9% by late 2013. Short-term unemployment is also prominent among the prime-age group.

4.3 The relation between unemployment and GDP

As mentioned before, the Dutch Great Recession is characterised by two subsequent periods of negative growth, while most other Northern-European countries did not experience this double dip. This might be the reason why these other countries witnessed a (prudent) stabilisation of their labour market in recent years, while the Netherlands did not. The question is whether the current rise fits the nature of the crisis in the Netherlands. A conventional and simple method to link labour market developments to cyclical fluctuations is to analyse the statistical relationship between the development of GDP and unemployment. This empirical relationship is often referred to as “Okun’s Law”, after the American economist Arthur Okun, who was the first to document it (Okun, 1962).

The use of Okun’s Law is not undisputed (cf. Knotek, 2007; Meyer and Tasci, 2012). The relationship is static in nature, ignoring labour market adaptations towards the steady-state equilibrium. Gordon (2010) obviates this problem, by transforming Okun’s Law into an error-correction model, which takes into account the long-term steady state of the labour market:

\[
\Delta U_t = \alpha \Delta U_{t-1} + \beta_1 \Delta Y_t - c + (\beta_2 \Delta Y_{t-1} - c) + \phi(U_{t-1} - U^*_{t-1})
\]  

(1)

In equation (1), \(U\) represents the unemployment rate, \(Y\) is GDP in volumes (prices of 2005) and \(U^*\) symbolises the structural rate of unemployment. Parameter \(c\) is a constant term, indicating the economic growth rate necessary for unemployment to remain constant. \(\phi\) represents the error-correction mechanism, which pulls deviations from the steady-state towards the equilibrium long-run value.

We follow the same approach as Erken et al. (2014) to estimate the unemployment model. Equation (1) is estimated for the Netherlands using data from Statistics Netherlands. Another issue is which data to use for structural unemployment. Erken et al. (2014) use data on the Non-Accelerating Inflation Rate of Unemployment (NAIRU) from the OECD.
(Economic Outlook, long-run projections, July 2013). However, the CPB also conducts estimates on structural unemployment, which we want to use in order to test the robustness of the model. We run regressions for the sample period 1985-2008, as structural unemployment in the CPB and OECD data series during the 70s until the mid 80s differ to a large extent and the margin of error becomes too large. Table 1 shows the results of the estimates.

### Table 4.1 Unemployment model

<table>
<thead>
<tr>
<th>Percentage change of the unemployment rate</th>
<th>( \Delta(U_t) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPB ( U^* )</td>
<td>OECD ( U^* )</td>
</tr>
<tr>
<td>Constant term ( c )</td>
<td>2.33(^*)</td>
</tr>
<tr>
<td>Lagged dependent variable ( \Delta U_{t-1} )</td>
<td>0.42(^*)</td>
</tr>
<tr>
<td>Mutation of GDP ( \Delta Y_t )</td>
<td>-0.06</td>
</tr>
<tr>
<td>Mutation of GDP lagged one year ( \Delta Y_{t-1} )</td>
<td>-0.21(^*)</td>
</tr>
<tr>
<td>Error-correction parameter ( U_t - U^*_{t-1} )</td>
<td>-0.36(^*)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>1985-2008</th>
<th>1985-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N )</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.76</td>
<td>0.81</td>
</tr>
<tr>
<td>D.W.</td>
<td>2.3</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Statistics based on robust standard errors in parenthesis. *, ** denote significance at 10% and 5% respectively.

The results of both estimates are similar. The constant term shows that economic growth has to equal approximately 2¼% for unemployment to remain stable. Next, GDP does not have a direct impact on unemployment (i.e. \( \beta_1 \) is not significant), but does affect unemployment after one year. This is as expected, as the labour market reacts on cyclical movements with a certain time lag: it takes time for employers to lay-off workers or fill new job openings. The effect in the second year after a drop of GDP by 1 percentage point is equal to roughly -0.3 percentage points.\(^{17}\) In the long run, the effect roughly lies between -0.45 and -0.55 percentage points. Finally, the error-correction mechanism \( (\phi) \) generates a relative fast movement towards the steady-state: in one year, approximately \( \frac{1}{3} \) of the employment gap is closed.

We use the unemployment model to draw an expected path of unemployment during the Great Recession and the aftermath. The results are illustrated in Figure 4.5. The orange and blue lines are the fitted values of the unemployment model (using either structural unemployment data from the CPB or the OECD, respectively). The black line shows the unemployment realisations. The dotted lines illustrate the forecasts of the model.

Figure 4.5 shows that our model expected a much faster pace of unemployment increase in the first phase of the crisis. The actual rise in unemployment in the period 2008-2011

\(^{17}\) Effect in year \( t+1 = \beta_1 \times (1+\alpha) + \beta_2 \). Long-run effect = \( (\beta_1 + \beta_2) / (1-\alpha) \).
amounts to 115 thousand people, while the forecasted rise according to the model was 220 thousand.

The response of the labour market in the second phase of the crisis was the opposite of the first phase. Unemployment growth sped up much faster than expected by 215 thousand persons, while the model forecasted a rise of 100 thousand additional unemployed. These conclusions match those by Erken et al. (2014), although the level of the expected rise of unemployment in the first phase of the crisis in their prediction was somewhat lower. In order to find out what caused the atypical unemployment pattern in the Netherlands, we need to examine labour supply and demand separately.

4.4 A decomposition of unemployment into labour demand and labour supply

Unemployment changes are determined by changes in labour demand and labour supply. Figure 4.6 shows the contribution of labour demand and supply to the change in unemployment in persons. The contribution of labour demand (measured by the employed labour force) to the change in unemployment is illustrated by the purple surface. If the purple surface is negative, it means that employment is growing and unemployment is affected negatively. The contribution of labour supply (measured by the labour force) to changes in unemployment is indicated by the orange surface. If the orange surface is positive in Figure 4.6, this means that more people enter the labour market and this will put upward pressure on unemployment (when not accommodated by a rise in employment). Vice versa, if the orange surface becomes negative, people are withdrawing from the labour market and this will result to decreasing unemployment. The change of unemployment in persons is illustrated by the black line, which is the net result of the contribution of labour demand (purple surface) and labour supply (orange surface). The recessions are clearly visible by the peaks of the black line.
Generally speaking, the contribution of labour supply and demand are each other’s “counterparts”, resulting in a stable development of unemployment changes most of the time (except for the recession periods). For instance, additional labour supply of especially women in the mid 80s and 90s was completely absorbed by increasing employment, leaving unemployment changes constant or declining (except for the period 1992-1995).

Looking at the economic downturns across time, the 1980s crisis, ICT-crisis and the first phase of the Great Recession were dominated by negative labour demand effects (see the positive purple spikes in Figure 4.6). The 1990s dip and especially the second phase of the Great Recession were dominated by labour supply effects. Two notable observations can be made in relation to the Great Recession. The first unemployment peak during the Great Recession was relatively mild, when compared with the other economic busts over time. This was caused by a drop in employment (purple spike in 2010) that was less severe than during the 80s and ICT crises, although the GDP decline was much larger in 2009. The second notable observation concerns 2013: the supply effects were still attributing to an increase in unemployment; while labour demand was decreasing. This combined contribution of supply and demand effects (i.e. the dark purple spikes in Figure 4.6) resulted in the largest increase of unemployment (130 thousand additional unemployed) over the entire period of observation.

As mentioned above, and illustrated again in Figure 4.7, the first phase of the Dutch Great Recession in the years 2008-2011 was characterised by an unemployment rise (solid line) that was smaller than the expected increase (dotted line). The discrepancy between actual and predicted unemployment in the first phase of the crisis can be attributed to labour demand effects. Due to labour hoarding (see Chapter 2), the decline in GDP did not translate into a proportional decline in employment. Consequently, unemployment increased to a lesser extent than expected (see *Phase 1: labour hoarding* in Figure 4.7).
The second phase of the crisis was different: unemployment rose more rapidly than anticipated in the years 2011-2013. It would be obvious to attribute this strong rise in unemployment to a catch-up in layoffs. Employers that were hoarding labour in the first phase of the crisis were faced with a recession that lasted longer than expected, resulting in lower financial buffers and, consequently, a higher rate of layoffs in the second phase (given the second GDP decline in 2012). More research is needed to determine whether a catching-up process in layoffs has actually taken place.

We do have evidence, however, that during the second phase (2011-2013) of the crisis excessive labour supply played a prominent role in the rapid increase in unemployment (Figure 4.6). By excessive labour supply (see Phase 2: excessive supply in Figure 4.7) we mean that the cyclical decline in labour force participation was low given the decline of the output gap (See Chapter 3). This was caused by a relatively large inflow from non-participation in 2011-2013 and less exits from the labour force by older workers than expected.

### 4.5 Structural and cyclical unemployment

There are two contrasting views about labour market prospects after the Great Recession. The first view is that the Great Recession has wrought permanent damage to the level of unemployment; the second view is that the damage is only temporary. The permanency of the unemployment effects is important for the interpretation how the Dutch labour market will recover from the Great Recession. In this section, we analyse the strength of the evidence suggesting long-run effects. We examine the possibility of so-called hysteresis in unemployment and scarring effects.

#### 4.5.1 The hysteresis versus the natural rate hypothesis

In principle, labour demand and labour supply will return to their equilibrium after the Great Recession. The mechanism is as follows. Currently, unemployed workers are searching for a job; their income levels are below their previous wage and they run the risk
of a further fall in income once their unemployment benefits expire. This moderates their wage claims, which gives room for lower wages. Labour demand is currently low, which puts downward pressure on wages. Once the economy expands, firms open up more vacancies. As labour demand increases, employment increases and unemployment declines. This process takes time. This phenomenon is called \textit{persistence} (Bean, 1994) in unemployment and relates to slow adjustment processes of an economy to make up for previous losses and return to full potential output.

There is an extensive debate among economists whether high unemployment can also affect structural unemployment. One strand of literature argues that in the long run unemployment returns to its natural rate, which solely is determined by labour market frictions caused by changing institutions (Friedman, 1968; Stiglitz, 1997). This hypothesis is referred to as the \textit{natural rate hypothesis}. This means that structural unemployment is unaffected by changes in aggregate demand.

At the other end of the spectrum, there is literature advocating that cyclical unemployment can affect structural unemployment, which is referred to as \textit{the hysteresis hypothesis} (Blanchard and Summers, 1986). The term “hysteresis” is borrowed by economists from studies examining electromagnetism and encompasses the idea that transitory causes have permanent effects. In theory, hysteresis could be the result of wage-bargaining processes. When unemployment rises, the position of “insiders” on the labour market (i.e. employees) is strengthened relative to the position of “outsiders” (unemployed), enabling insiders to bargain for higher wages, which causes structural unemployment to rise as well. Hysteresis as a result wage rigidity especially seemed prevalent in continental Europe and not in the US (Blanchard and Summers, 1986).

Hysteresis could also be caused by obsolesce of knowledge and skills as a result of economic downturns. This happens when people are inactive for a long period of time and qualitative mismatches increase (Ball, 2009). During unemployment, human capital depreciates, as it is difficult to maintain and update relevant knowledge and skills when out of work (Ljungqvist and Sargent, 1998). It may result from declining skills, for example because of technological developments, or from the restructuring of sectors which make some knowledge and skills outdated. Job search may also diminish as the unemployed lose contact with the labour market and awareness of job offers (Guichard and Rusticelli, 2010). Pollak (2013) shows that skill depreciation in combination with the generosity of the unemployment insurance system in Germany was a key factor in explaining differences in labour market performances between Germany and the US.

\textbf{Empirical literature on hysteresis}

In the empirical literature, the natural rate and hysteresis hypotheses have been examined extensively. The conventional method is to observe if unemployment rates converge to an equilibrium value in the long run. An unemployment rate that meanders is more in line with the hysteresis view: transitory shocks in the unemployment rate have a lasting effect on its level. For most European countries, the early literature finds evidence in favour of the hysteresis hypothesis (Roed, 1997). Later, these findings were disputed by studies claiming
that many countries experienced structural breaks in their unemployment rates over time. When structural breaks are taken into account, the hysteresis hypothesis is rejected most of the time (e.g. Arestis and Mariscal, 1999; Ewing and Wunnava, 2001). Studies that use panel unit root tests are more ambivalent: Christopoulos and Leon-Ledesma (2007); Camarero et al. (2006) and Lee and Chang (2012) reject the hysteresis hypothesis for most countries, whereas Chang (2012) and Cheng et al. (2012) can not reject it. Van Ours (2009) concludes that the unemployment gap in the Netherlands that was the result of the economic bust in the 80s has closed over time, thus providing little evidence of hysteresis in the Netherlands.

Measurement of structural unemployment

Structural unemployment is not directly observable, and different techniques have been developed for its measurement (e.g. Fabiani and Mestre, 2000). The CPB uses solely structural factors, such as the replacement rate and the tax wedge, to determine structural unemployment (see Box ‘Structural unemployed measured by the CPB’). Another approach, which is adopted by the European Commission and the OECD, is to estimate the Non-Accelerating (Wage) Inflation Rate of Unemployment (NAIRU/NAWRU). The NAIRU/NAWRU corresponds to the unemployment rate in the absence of temporary supply shocks and at a constant rate of inflation. Hence, the NAIRU/NAWRU is consistent with a reduced form system of a structural wage-price setting model (Guichard and Rusticelli, 2010). If unemployment is above the NAIRU/NAWRU, the labour market slack would gradually result in lower inflation, caused by the dynamic adjustment of wages and inflation. Vice versa, an unemployment rate below the NAIRU/NAWRU causes inflation to rise.

Figure 4.8 illustrates the development of actual and structural unemployment measured by the OECD, the CPB and the European Commission. The Dutch NAIRU calculated by the OECD shows a similar pattern as the structural unemployment forecasts by the CPB. The graph illustrates that the Dutch NAIRU does not seem to be affected by the Great Recession, despite the relatively large increase of Dutch cyclical unemployment. However, the NAWRU calculated by the European Commission shows a relatively large increase, following the cyclical unemployment pattern to a much larger extent.

Both the OECD and the European Commission derive the NAIRU/NAWRU by using a Kalman filter to estimate a Philips curve (linking inflation to the unemployment gap) under a number of assumptions (cf. Gianella et al. 2008; Guichard and Rusticelli, 2010; Orlandi, 2012; European Commission, 2013a; D’Auria et al., 2010). The advantage of the OECD and EC methodology is that it does not require a specification of all factors affecting structural unemployment (Guichard and Rusticelli, 2010). The downside is that the NAWRU is likely to follow cyclical unemployment (European Commission, 2013a; Figure 4.8). Real wages adjust slowly to labour demand shocks, hence adjustments take place partly in terms of

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18 The European Commission actually estimates the Non-Accelerating Wage Inflation Rate of unemployment (NAWRU). Although the methodology is very similar to the one used by the OECD, the Phillips curve framework is different and structural unemployment is based on a measure of price inflation rather than wage inflation.

19 The last update of the NAIRU using the OECD standard methodology (Gianelli et al., 2008) was Spring 2010 (Guichard and Rusticelli, 2010). Since then the estimations by the OECD have not been revised and the NAIRU is held constant, except when there is evidence that policy reforms may have had an influence or when labour market developments imply large changes in long-term unemployment. This was the case in, for instance, Spain and Portugal.
unemployment. Consequently, the NAWRU may diverge from the value of structural
unemployment which depends solely on structural factors. The European Commission
(2013a, p. 84) indeed argues that the NAWRU tends to exhibit large oscillations, which are
"likely to be partly driven by cyclical rather than structural factors".

Figure 4.8  Unemployment, structural unemployment, the NAIRU and NAWRU

The European Commission (2013a) also estimates the NAWRU based solely on its
determinants, such as policy settings (e.g. the tax wedge and active labour market policies),
labour market mismatch indicators and labour demand determinants. The NAWRU levels
fall substantially for countries with the highest unemployment increases due to the crisis. In
general, levels fall even further when cyclical labour demand variables are removed (i.e.
total factor productivity growth and capital growth). These estimates are very similar to the
ones conducted by the CPB on structural unemployment. Not surprisingly, for the
Netherlands the predicted NAWRU’s by the EC based on solely institutional factors remains
fairly stable (European Commission, 2013a, p. 89).

Scarring
Although there does not appear to be a hard case for hysteresis in unemployment (i.e.
quantitative hysteresis), there is also a possibility of hysteresis in the "qualitative" sense of
the word. By qualitative hysteresis we suggest that long spells of unemployment affect
labour market prospects of unemployed negatively, in terms of both wages as well as future
unemployment experiences. Economic theory is inconclusive whether or not these so-called
"scarring effects" can be permanent. Based on the human capital theory, shortfalls in wages
due to unemployment are temporary, as marginal earnings of investments in human capital
are diminishing (Becker, 2009). Other economists, however, argue that scarring effects can
be very persistent when unemployed workers lose some of their skills. People who have a
history of unemployment could be “trapped” in less-paid jobs which have a higher risk of
disappearing. First, past unemployment could be interpreted as a signal by employers that
these individuals are less productive (signalling effect). Secondly, long unemployment
spells could result in a lower reservation wages among the unemployed, inducing them to
accept less-paid jobs.
The empirical literature shows that scarring effects can be significant and persistent. For the British labour market, Arulampalam (2001) finds that a spell of unemployment will result in a wage penalty of 6% on re-entry and after 3 years, individuals are earning 14% less than what they would have received without unemployment. Gregg and Tominey (2005) examine the impact of youth unemployment on wages twenty years later. They find that early unemployment causes a wage penalty between 13 and 21%. This penalty is around 10% when individuals succeed in avoiding repeated unemployment. Kahn (2010) examines the effect of weak labour market entrances in the US during the 80s on wages. Although the negative impact on wages declines over time, the effect still is significant 15 years after graduation.

There are also Dutch studies examining scarring effects. Erpelinck and Van Sonsbeek (2012) find evidence that higher educated workers who entered the labour market between 1990 and 1994 were still coping with wage penalties in 2006, which is on average more than 5%. Research by Mooi-Reçi (2008) finds similar results. Wages of unemployed men are 8% below the wages of men that did not experience unemployment, and for women the wage penalty amounted to 13%.

**Figure 4.9 Concept of the Beveridge curve**

![Beveridge Curve Diagram](source.png)

**Mismatch**

Mismatch can manifest itself in mismatches between the skills that employees demand and the skills that the unemployed offer. In a labour market with pronounced mismatches, both unemployment and the vacancy rate will be high. The relation between vacancies and unemployment is commonly described by the Beveridge curve (Figure 4.9).

When labour demand is weak, employers are reluctant to hire and the number of unfilled vacancies is low while the unemployment rate is high (position 2 on the BC curve). Conversely, in a tight labour market employers find it difficult to fill open positions, the job vacancy rate is high and the unemployment rate low (position 2 on BC). Movements along the Beveridge curve are linked to changing incentives to post a vacancy, which are in turn
related to cyclical fluctuations in labour demand. Since vacancies react faster than unemployment, labour demand shocks are followed by counterclockwise loops in the vacancy-unemployment relationship without the Beveridge curve being permanently shifted. Blanchard and Diamond (1989) point out that temporary deviations from the Beveridge curve can be quite strong during the adjustment period.

In contrast to movements along the Beveridge curve, a shift of the Beveridge curve is associated with structural changes on the labour market. An outward shift of the Beveridge curve (BC’ in Figure 1) may be caused by deteriorating matching efficiency, implying that more vacancies are needed to keep unemployment at a given level (while the opposite happens if the matching efficiency improves). The changes are linked to the efficiency of workers-to-jobs-matches and the rate at which existing jobs are destroyed. In the last-mentioned case, firms are hiring fewer workers per job opening than could be expected given the historical trend. These two effects consequently have a negative effect on effective labour allocation throughout the economy.

Figure 4.10  The Beveridge curve in the Netherlands during four downturns

![Figure 4.10](image)

Source: own calculations based on data from Statistics Netherlands.

Figure 4.10 shows the Beveridge curve during four economic downturns. In each economic cycle the curve starts one year after the peak in GDP growth and ends one year after the next peak.

The recession in the 1990s and the ICT crisis in the early 2000s show the expected counterclockwise adjustment pattern. The movement along a somewhat arbitrary drawn curve, with almost identical values at the beginning and end of the cycle, indicates that the deterioration on the Dutch labour market was primarily cyclical in nature, rather than
structural. But the recession of the 1980s is a different case in point. After the 1980 recession, we witnessed an outward shift of the Beveridge curve. Besides a lack of appropriate training and skills, the OECD (1993) attributes the outward shift of the Beveridge curve in the Netherlands to supply-side problems related to incentives and motivation. There were difficulties in filling low-skilled jobs, while unemployment among the low-skilled was high as well. Replacement rates in the Netherlands were among the highest of the OECD in this period (OECD, 1993). Evidence of an outward shift in the Beveridge curve after the recession in the 1980s due to high long-term unemployment is also reported by Driehuis (1990).

Figure 4.10 also illustrates the development of the Beveridge curve in the Netherlands during the Great Recession. It is yet unknown whether the vacancy-to-unemployment rate will recover by its usual counter-clockwise pattern, or whether long-term unemployed will have lost so much human capital that the pattern of the 1980s will be repeated. Up till now, there is limited evidence of a Dutch shift of the Beveridge curve (Hobijn and Şahin, 2013; European Commission, 2013a).

The high replacement rates of the 80s is no longer present, but this time the length and depth of the recession might be reason for alarm, since this has led to a high rate of long-term unemployment (see Figure 4.4). The first quarter of 2014 shows a slight upward jump in vacancies, without a decline in unemployment. It is too early to tell whether this is the start of a counter-clockwise adjustment pattern or of a shift in the Beveridge curve.

**Conclusion**

At this point there seems to be only little evidence that the Dutch Great Recession has affected the structural rate of unemployment. The analysis seems to point towards more support for the natural rate hypothesis than for the hysteresis hypothesis. The empirical literature in general finds limited evidence for the hysteresis hypothesis. And for the Dutch case, the possibility of hysteresis seems to be unlikely: the institutional setting is stimulating participation and is still having negative effects on structural unemployment. In addition, long-term employment among the young is relatively low (see Figure 4.4) and skill mismatches up till now do not seem to be prevalent in the Netherlands.

Empirical evidence does, however, show that scarring effects could occur and become persistent, which makes a case for permanent loss of human capital. Hence, although the quantitative effects in terms unemployment is limited, “qualitative hysteresis” could result in permanent loss of welfare.
Key factors behind the equilibrium rate of unemployment are the tax wedge, the replacement rate and the relative price of capital (see Broer et al. 1999). The tax wedge measures the discrepancy between real labour costs for firms and the net wage for workers. The replacement rate measures the fallback position of workers when they lose their job. The relative price of capital is determined by the markup of firms, capital costs and subsidies and taxes on wage costs.

The figure below shows that all these effects together lead to an increase in the structural rate of unemployment from 3¾% in 2014 to 4¼% in 2023. Nearly all of this increase is driven by the relative prices of capital, mainly because firms intend to improve profit margins which were under pressure during the crisis. This is partly counterbalanced by the growing negative effect of the replacement rate on structural unemployment (orange bars). This negative effect is caused by phasing out the double tax credit in the reference minimum wage until 2033 (for more information on this policy measure: see European Commission, 2013b).

Figure 4.13  Forecasts for the structural unemployment rate (left-hand axis) and the contribution of its components (right-hand axis)

The CPB concept of the equilibrium rate of unemployment is developed in the late nineties, in a period where self-employment was hardly relevant and where temporary employment was less important than nowadays. Self-employment may affect the equilibrium rate in at least two ways. It affects the fall-back position of workers and creates opportunities for firms to expand production by hiring self-employed person rather than recruiting employees. Future research is needed to investigate the implications of this development for the equilibrium rate of unemployment. For now, we are convinced that the unemployment rate will fall to a rate of about 4% once the economy recovers.
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Appendix 1 Structural participation levels

This appendix deals with the construction of structural participation levels, used in this study. Labour supply in CPB models is defined as the sum of persons employed according to the National Accounts and the unemployed according to the Labour Force Survey (LFS). This definition of labour supply differs slightly from the one in the LFS. The reason is that the National Accounts provide most of the data used in CPB models and we want the number of persons employed to be consistent with this data source.

In order to construct the structural participation levels, we first divide the number of persons employed by gender into five year age groups, by using the age distribution of the labour force (international definition) for the years 1987-2013. The number of persons employed in the National Accounts is slightly higher than the employed labour force in the LFS. To avoid participation rates to exceed 1, we use the age distribution of the non-working persons (unemployed plus inactive) and divide the inactive persons in the Netherlands (total population minus working persons) into five year age groups. The amount of persons employed by five year age groups are calculated by subtracting the inactive population from the total population. The unemployed (source LFS) by gender and five year age groups are added to calculate the labour force by gender and five year age groups \( (i) \). Participation rates are calculated by dividing the labour force by the total population.

In the second step we correct the figures for policy measures which have a significant effect on labour participation. The “policy-free” labour force participation rates by gender and five year age groups are calculated by subtracting the effect of eleven policy measures on the labour force, divided into five years age groups.

The third step consists of a transformation of the times series (backwards and forwards) using Hodrick Prescott (HP) filter techniques in between the transformations. The transformation formula:

\[
B_i = \ln \frac{a_i}{1 - a_i}
\]

yields values \( (B) \) per age cohort \( i \) that are smoothed by using the HP-filter technique. The HP-filter is used to correct the (policy-free) transformed labour force participation rates \( (B) \) for cyclical effects. The results of the HP-filter \( (C) \) are extrapolated for each cohort to the end of the forecast period. The return transformation formula:

\[
D_i = \frac{1}{e^{-c} + 1}
\]

yields the participation rates \( (D) \) per age cohort \( i \). The transformation is conducted to avoid the possibility of future participation rates exceeding 1.
The fourth step is to add the effect of the policy measures on the participation rate ($D$) per cohort $i$. The structural participation rates are cumulated in order to yield the macro structural participation rate used in this study. Finally, cyclical labour supply is calculated as the difference between actual and structural labour supply.