Evaluating the effect of participation in subsidised employment

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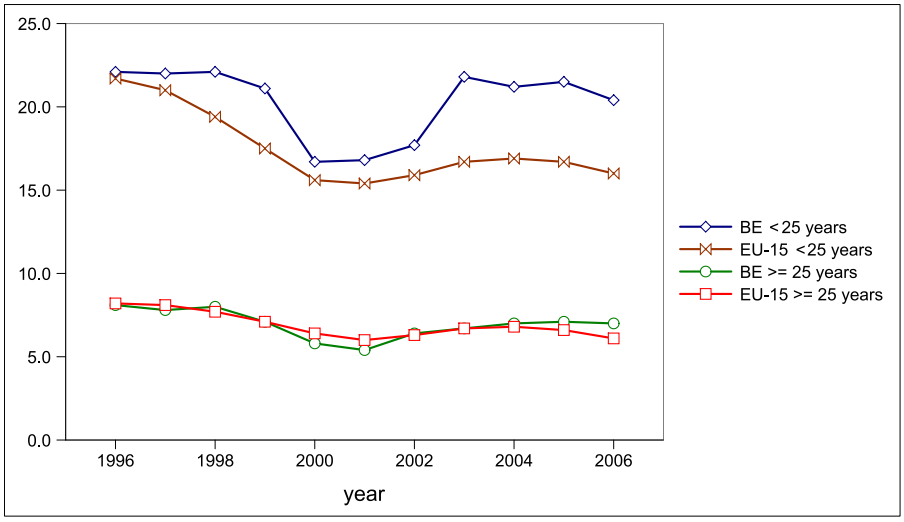
Contents

Chapter 1

Introduction

High unemployment rates for young people in most European Countries Most European countries are affected by high unemployment rates for young people. Figure 1.1 illustrates that despite the fact that fighting youth-unemployment has been on the political agenda in virtually all of the affected countries during the last years, the unemployment rate for young workers has remained higher than for the rest of the active population.

Figure 1.1: Unemployment rates in percentage for young people



Note: Eurostat, adjusted average of yearly unemployment rates.
BE refers to Belgium, EU-15 refers to the countries of the European Union before the accession of new member states in 2004. <25 years refers to the active population which is under 25 years of age.

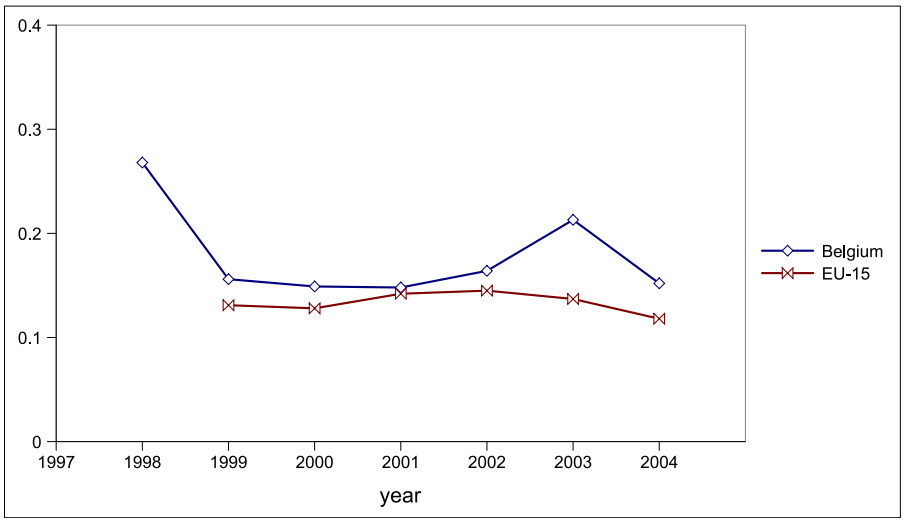
Indeed, even though the difference between the unemployment rates has slightly decreased between 1996 and 2006, there is still a considerable gap between the unemployment rates for different age groups. In 2006 the unemployment rate in the EU-15 countries was 16% for workers under 25 years of age while it was only 6.1% for the rest of the active population. The difference in unemployment rates is even more pronounced in Belgium, the country considered in this thesis.

The public spending on employment incentives is substantial Virtually all European countries have a range of active labour market programmes (ALMP), which try to integrate unemployed workers into employment. The most common ALMP programmes are training programmes, special programmes for workers with unfavourable characteristics or employment incentive programmes. The latter are defined as programmes that "facilitate the recruitment of unemployed persons and other target groups, or help to ensure the continued employment of persons at risk of involuntary job loss", whereas the "majority of the

labour cost is normally covered by the employer" (Eurostat (2003b)).

Employment subsidy programmes, as investigated here, constitute a major part of employment incentive programmes in most countries. A substantial amount of money is spent for this type of labour market policy.

Figure 1.2: Yearly expenditures for employment incentive programmes as a percentage of the GDP



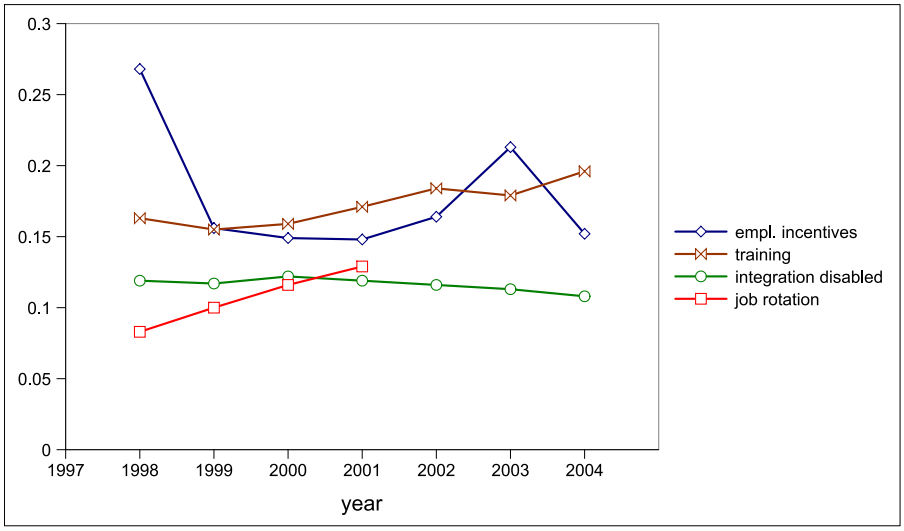
Note: Eurostat, labour market statistics.

Figure 1.2 shows the expenditures for employment incentive programmes for the EU-15 countries and Belgium, as a percentage of the GDP. From 1999 to 2004, more than 0.11% of the GDP has been spent on incentive programmes every year, in the EU-15 countries. For Belgium the expenditures are slightly higher. The total spending in the EU-15 countries in 2004 is about eleven billion Euros and Belgium spent as many as 436 million Euros for employment incentive programmes.

In order to put these numbers into perspective, Figure 1.3 provides the expenditures for different types of active labour market policy programmes in Belgium.

The amount of money spent for employment incentives is comparable to what is spent for training programmes and higher than spending on integration of disabled persons or job rotation programmes.

Figure 1.3: Expenditures for different types of ALMP programmes in Belgium as a percentage of the GDP



Note: Eurostat, labour market statistics.

Despite the common use of employment subsidy programmes, surprisingly little is known about the effects of participation in these programmes on labour market transitions. In particular, there is hardly any research which investigates the effect of employment subsidy programmes for young workers (Martin and Grubb (2001), Lee (2005)).

This thesis provides causal evidence on the effect of participation in subsidised employment for long term unemployed school leavers. The aim is to provide an evaluation of the effectiveness of subsidised employment. The thesis is composed of three *independent* empirical studies which look at different aspects of the effect of participation in a Belgian employment subsidy programme. The analysed programme provides a temporary subsidy to employers, if they hire participating long term unemployed workers. The subsidy is implemented in form of a reduction in social insurance contributions. In all chapters we analyse the effect of participation on durations (e.g. duration in unemployment, duration in employment).

This chapter is structured as follows. In section 1.1 we introduce the problem of causal analysis. Section 1.2 outlines the main character-

istics of the investigated employment subsidy programme. Section 1.3 provides the research questions that we try to answer in the different chapters. The data is introduced in section 1.4. Section 1.5 gives an overview of the connections between the different chapters. After the summary of the findings, provided in section 1.6, sections 1.7 outlines the economic theory and provides an interpretation of the findings. Finally, in section 1.8 we propose policy recommendations.

1.1 The estimation of causal effects of participation

The estimation of causal effects of participation in a policy programme requires to overcome the "fundamental problem of causal inference" (Holland (1986)), namely the fact that for a given subject we can *not* observe the participation *and* the non-participation outcome at the same time.[1]

One idea to overcome this problem is the use of information on non-participating individuals, in order to derive estimates for the counterfactual outcome. However, since individuals are not identical, one needs a convincing strategy that allows to derive correct estimates, despite the differences between individuals.

One such strategy is the use of large samples where participation or non-participation are random (i.e. experimental date). Then, one can simply compute the difference of the average of the outcome of both groups to get an estimate of the average effect of participation.

However, in the following we do not have experimental data at our disposal. When aiming to estimate causal effects of programme participation in a non-experimental setting, one has to control for the characteristics of the participants. This is necessary since it is possible that the characteristics of the participants of a programme are systematically different from the non-participants. This phenomenon is referred to as "selection" in the evaluation literature, since systematical differences of participants and non-participants can be thought of as being the result

[1] Obviously, the difference between both outcomes would be the individual effect of participation.

of a selection process. We need to employ empirical strategies to overcome potential selection problems. Thereby we are able to determine whether different labour market performances of participants versus non-participants are due to the programme participation or to the specific individual characteristics.

A large set of statistical methods have been developed during the recent years to overcome selection problems. Heckman and Hotz (1989), Heckman et al. (1999) or Costa-Dias and Blundell (2002b) review different statistical models.

All the studies in this thesis use multivariate mixed proportional hazard models to control for selective participation (van den Berg (2001), Abbring and van den Berg (2003b)). We take the possibility of selection into account by incorporating a large number of explanatory variables and by allowing for correlation of the unobserved heterogeneity terms within mixed proportional hazard models.

1.2 Introduction to the Recruitment Plan

In this section, we introduce the investigated employment subsidy programme. Moreover, in the second part of this section, we summarise the development of other employment subsidies, i.e. structural employment subsidies, in Belgium. This is of interest, since employers can *not* receive the subsidy provided by the subsidy programme *and* a structural employment subsidy for the same employer, at the same time. Finally, we discuss possible implications of the existence of these structural subsidies for the participation in the employment subsidy programme.

In the following studies, we estimate the effect of participation in the Belgian **Recruitment Plan**, an employment subsidy programme that offers temporary subsidies to employers who hire long term unemployed workers. In the sequel we restrict the description of the Recruitment Plan to the elements which are relevant for the group of school leavers without employment experience that are considered in this thesis.

The Recruitment Plan is **mainly for employment in the private sector**. ***Employers*** who benefit from a reduction in social insurance contributions through the "Recruitment Plan" are not allowed to benefit from other measures for the same individual at the same time.

In order to become eligible, young ***employees*** have to be unemployed job-seekers for at least 12 months "without interruption". A period of unemployment is considered to be "without interruption" when the period in which the unemployed individual does not receive unemployment benefits is not longer than four months.

The ***subsidy*** consists in a temporary reduction of social insurance contributions on the employer's side. The entitlement to the subsidy is tied to a specific employment contract and cannot be transferred to a new employment contract. This implies that workers lose their entitlement for the Recruitment Plan when they change their employer, or when they negotiate a new employment contract with their present employer. The Recruitment Plan provides subsidies for standard employment contracts, with the only restriction that the employment has to be at least half-time. The Belgian labour legislation applies in the same way as to any non-subsidised employment contract. This implies the possibility to hire on the basis of a temporary employment contract or a contract of undetermined duration.

The subsidy is **provided** for a period of approximately **two years** and ends after the second year. In the following we refer to the *first year* of subsidies for the quarter of hiring and the four subsequent quarters and to the *second year* of subsidies from the fifth to the eighth quarter. During the first year of participation the subsidy is higher than during the second year. In addition, the level of the subsidy depends on the duration in unemployment prior to the subsidised employment. Basically, there are two different subsidy schemes: One for participants who have been unemployed for at least 12 months and another for participants who have been unemployed for at least 24 months prior to their participation in the Recruitment Plan. Table 1.1 provides an overview of the reduction in social insurance contributions and how this translates into a reduction in gross wage.

For participants who are unemployed for at least *12 months* the sub-

sidy is 75% of the social insurance contributions during the first year and 50% for the second year. For participants who are unemployed for at least *24 months* the subsidies are higher: 100% of social insurance contributions during the first and 75% during the second year of participation. The social insurance contribution for the employers is between 32% and 34% of the gross wage. Therefore, participation in the employment subsidy programme translates into a reduction that ranges between 16.2% and 34.1% of the gross wage.

Table 1.1: Subsidy in percentage of social insurance contributions

preceding unemployment	1st year of subsidy	2nd year of subsidy
12 months ≤unempl. <24 months	**75%** ≙ 24.3-25.6% of gross wage	**50%** ≙ 16.2-17% of gross wage
24 months ≤unempl.	**100%** ≙ 32.4-34.1% of gross wage	**75%** ≙ 24.3-25.6% of gross wage

1st year of subsidy refers to the quarter of entry into subsidised employment and the four subsequent quarters of employment. 2nd year includes the quarter five until eight after the quarter of entry.

From now on, we use the abbreviation **policy12** for the subsidy scheme provided to workers who have been unemployed between 12 and 24 months prior to participation and **policy24** for the higher subsidies which are provided if participants have been unemployed for at least 24 months of unemployment

Chapter two and three of this thesis analyse only programme participation in the policy12 scheme. Chapter four integrates also the participation in the policy24 scheme into the empirical analysis.

The **participation** of long term unemployed workers in the Recruitment Plan is not automatic. To become eligible for the subsidy, the unemployed worker or the employer must contact the unemployment office. The unemployment office checks whether the unemployed worker matches the eligibility conditions and then delivers a so called "recruitment card" which testifies that the worker is eligible for the subsidy.

This recruitment card has to be submitted to the social insurance authorities, by the employer.

Structural subsidies for low wage workers in Belgium Now, we provide an overview of the structural subsidies which have been present during the time period 1998-2001, for which we have data. Structural subsidies are defined as subsidies on the employer side which are provided for an unlimited period of time and should be distinguished from the participation in the Recruitment Plan which offers a temporary employment subsidy for long term unemployed workers.

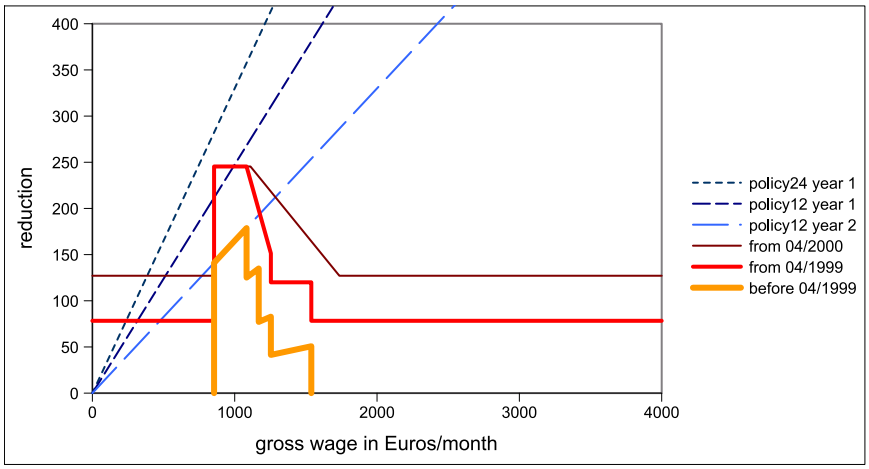
As mentioned above, the subsidy provided by the Recruitment Plan can not be cumulated with the structural subsidies. Consequently, participation in the Recruitment Plan implies receiving a temporary subsidy on the employer side *instead* of the structural subsidy. After the end of participation in the Recruitment Plan the employer can receive the structural subsidy, if he continues to hire the worker via a regular employment contract.

During the considered time period, there have been several reforms of the structural subsidies. In the following, we highlight only the most important changes. A more detailed description of the different subsidy regimes is provided in Cockx et al. (2005).

In order to enhance the comparability between the different structural subsidy regimes over time, the following discussion is based on full-time workers that are employed during the whole quarter. Figure 1.4 shows the reduction in wage costs for blue collar workers, Figure 1.5 those for white collar workers. In addition, the graphs provide the reduction that is provided during the first and second year of policy12 and policy24 in the Recruitment Plan.

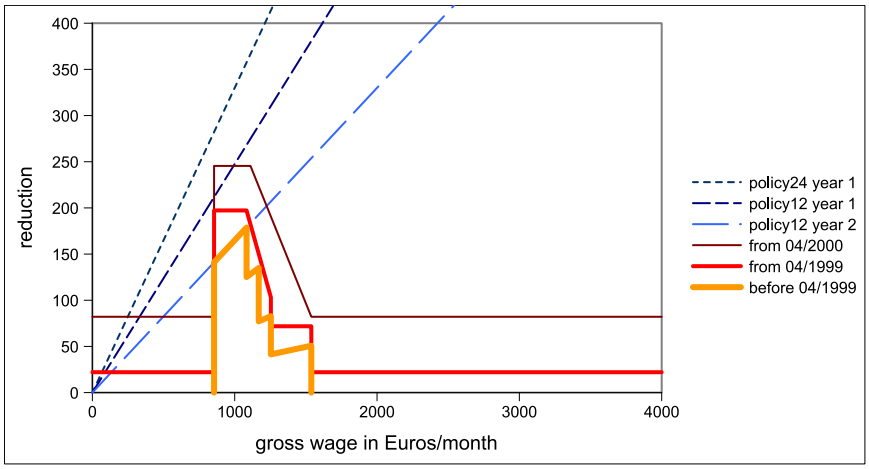
The solid lines represent the structural subsidies for the different time-periods. Starting with the period **before April 1999**, Figure 1.4 and Figure 1.5 show the structural subsidy which applies to all low wage workers in sectors which contribute to the social insurance system. For the same period, there is an *additional* programme, the Opération Maribel, which provides subsidies for blue collar workers in certain sectors (mainly for industry and trade) and which can be cumu-

Figure 1.4: Structural employment subsidies vs. Recruitment Plan for blue collar workers



Note: Solid lines are for structural subsidies. Dashed lines are for the reduction provided by the Recruitment Plan. The subsidy provided during the second year of policy24 is equal to the subsidy of the first year of policy12. Source: Cockx et al. (2005) and own computations.

Figure 1.5: Structural employment subsidies vs. Recruitment Plan for white collar workers



Note: Solid lines are for structural subsidies. Dashed lines are for the reduction provided by the Recruitment Plan. The subsidy provided during the second year of policy24 is equal to the subsidy of the first year of policy12. Source: Cockx et al. (2005) and own computation.

lated with the subsidy for low wage workers. For the example of a company with more than ten blue collar workers that employs exclusively blue collar workers this subsidy amounts to €68.58 per month for each worker. The amount of the cumulative structural subsidy which is composed of the subsidy for low wage workers and the subsidy of the Opération Maribel is therefore similar to the amount provided by the structural subsidy after April 1999. **From April 1999**, there exist two structural subsidy schemes, one for blue collar and one for white collar workers. The condition on certain sectors has been abandoned. **From April 2000**, the structural subsidy has been extended considerably, for both white and blue collar workers.

In Figure 1.4 and Figure1.5, one can see that the structural subsidy can be substantial for full-time workers with wages just above a threshold of €855. However, in order to evaluate the relevance of the structural subsidies, it is helpful to know that the average guaranteed **monthly minimum wage** of a full time worker is generally above this threshold. For example, in October 1997 the Belgian average guaranteed minimum wage has been €1074 per month, for full time workers. Furthermore, this minimum wage has been increased in several steps over the observation period and was €1141 per month at the end of 2001.

For workers *under 21 years* of age, the minimum wage is slightly lower. For example, the minimum wage for worker who are 18 years old amounts to 82-92% of the normal minimum wage, depending on the sector. Nevertheless, full time workers can be expected to earn more than the threshold of €855; and it is not surprising that only few workers in Belgium are reported to receive the maximum amount of structural subsidies that is paid at low gross wages (Cockx et al. (2005)).

We included the subsidy of the Recruitment Plan into the figures, in order to allow a **comparison** of the structural subsidies and the subsidies provided by participation in the Recruitment Plan. The dashed lines in Figure 1.4 and 1.5 indicate the reduction of social insurance contributions provided by participation, for different schemes. The reduction for both types of subsidies is hardly different during the first year of the Recruitment Plan, for workers with a low gross wage. For

workers with a salary just above €855 per month the structural subsidy would be slightly bigger than the subsidy of the Recruitment Plan. We do not expect participation of such workers, since for them participation in the Recruitment Plan would result in higher effective wage costs than in the case of non-participation. Similar, it is not rational to stay in the policy12 scheme during the second year for workers with a low gross wage. For workers who are unemployed for more than 24 months prior to participation, the first year of the policy24 subsidy is always preferable to the structural subsidy.

From now on we simply use the term "subsidised employment" in order to refer to the Recruitment Plan.

1.3 Research questions

The aim of this section is to provide a first, rough overview of the research questions that we answer in the different chapters. For an introduction to the data, the reader is referred to section 1.4. For details on the model, the precise definitions of the labour market states and a discussion of the relationship between the different chapters we refer to section 1.5.

The microeconometric evaluation literature focuses mainly on the question whether participation in a certain labour market programme has the desired effects for the participants. In the case of programmes for long term unemployed workers **the main objective is to integrate the participants into the labour market**.

In the literature, different strategies have been applied to analyse whether participation in employment subsidy programmes has an effect on the integration into the labour market. For example, one branch of the literature analyses the effect of participation on the employment probability at certain moments after the start of subsidised employment (Sianesi (2001), Larsson (2003), Caliendo et al. (2004), Gerfin et al. (2005)) or the total time spent in employment in a certain time interval (Carling and Larsson (2005)).

A different branch of the literature analyses the effect of participa-

tion on the duration until a transition into regular employment, without any programme participation; or on the duration until somebody has a transition out of unemployment (Lubjova and van Ours (1999), Forslund et al. (2004) and Fredriksson and Johansson (2004)).

Our **second chapter** fits into the latter line of research as we estimate the **effect of employment subsidies on the duration until regular employment.** More precisely, we are interested in whether a transition into subsidised employment has an effect on the duration until a transition into regular employment. This is our measure of integration into the labour market.

Figure 1.6: Overview of the labour market transitions in chapter two:

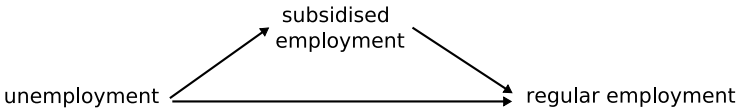


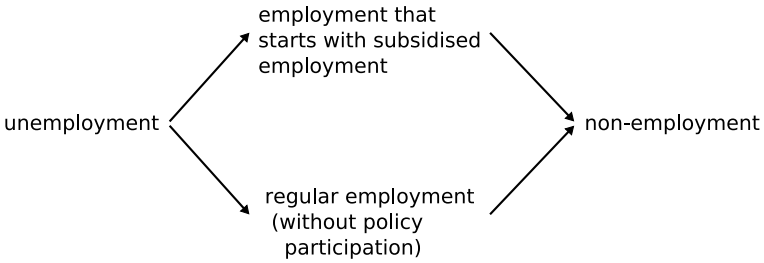
Figure 1.6 provides an illustration of the labour market transitions we have in mind. In chapter two, the effect of the transition into subsidised employment is captured by time varying dummy variables which are one for all periods after the transition into subsidised employment. In this approach, the time in subsidised employment is considered as a duration in which the worker is not integrated into the labour market.

The results of chapter two are useful to evaluate whether participation in a temporary labour market programme helps the participants to find a regular employment faster. Here, integration into the labour market is achieved as soon as the participant has a transition into regular employment, without any programme participation.

A different approach considers the time in subsidised employment as a period in which the participating worker is already integrated into the labour market and asks whether the duration of integration (subsidised or regular employment) is affected by the subsidy (Ridder (1986)). **Chapter three** follows this approach and provides estimates of the **effect of participation in subsidised employment on the em-**

ployment duration. Here, we estimate the impact of the temporary employment subsidies on the transition rate from *employment to non-employment.*

Figure 1.7: Overview of labour market transitions in chapter three:



Note: non-employment is defined as either unemployment or inactivity.

Figure 1.7 provides an illustration of the transitions which have been modelled in chapter three. Since we are interested in the employment duration, the focus is on the transition out of employment, or equivalently the transitions on the right hand side of the graph.

In chapter three, participation itself is considered as a possible type of integration into the labour market. This type of integration is contrasted to a regular employment spell. The results can be used to evaluate whether the subsidy is useful to increase the duration of the employment period as compared to a period where the worker would have a regular employment spell in the hypothetical case of non-participation.

A natural extension to the model of chapter three is to investigate whether there is an effect of a former programme participation on the duration of a subsequent unemployment (or non-employment) spell. This allows to evaluate whether participation has effects on the integration into the labour market beyond the first employment spell. In the past, such studies have been carried out for the effect of training or job preparation and work experience programmes (Gritz (1993), Bonnal et al. (1997)). To our knowledge, the only analysis which investigates the effect of subsidised employment on the duration of post-

participation spells is the study of Ridder (1986), which, however, has only a small sample size and does not control for selection in unobserved characteristics.

In this line of literature, in **chapter four** we estimate an **event history model** in which we consider the transitions between **three different labour market states**. Different from existing studies, where the focus is on post-participation effects only, we also use our estimates to simulate outcomes which are related to the results of chapter two and three. Therefore, this chapter provides a unified framework which incorporates various outcomes. We derive estimates that are similar to those of chapter two *and* three; *and* we are able to investigate whether there is an effect of a former participation in subsidised employment on the duration in a second unemployment spell, compared to the hypothetical case of a former regular employment.

Figure 1.8: Overview of labour market transitions in chapter four:

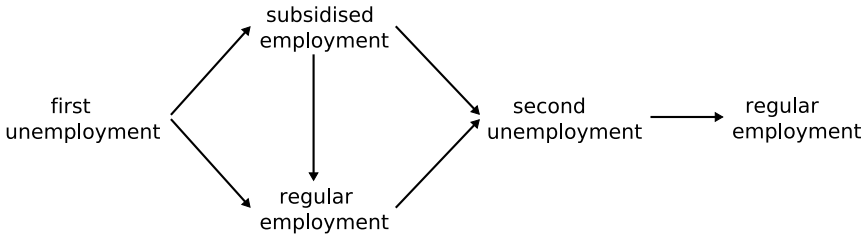


Figure 1.8 illustrates the transitions which have been modelled explicitly in chapter four.

1.4 A first look at the database

In the first part of this section, we provide an overview of the data that have been used throughout this thesis. In the second part of this section, we provide some descriptive statistics, which are a complement to the statistics that are integrated into the following chapters.

Before we start to introduce the data, it might also be useful to know that **chapter five** provides a detailed **guide to the database** that has

been used for the different studies of this thesis.[2] However, it must be pointed out that chapter five serves specific purposes, which are different from the following section. First of all, it should enable a researcher to understand the main issues and the underlying structure of the used raw data. Secondly, we document the process of data cleaning and preparation of the database for empirical research. Roughly speaking, chapter five aims to be a starting point for a researcher who wants to use the database for his/her own research. In order to reach this goal, we also explain the used, technical infrastructure.

Throughout the thesis we use an **administrative data** set that has been provided by the Belgian "Crossroad Bank for Social Security" (CBSS). The database contains information from the following institutions: The national unemployment office, the national offices for social security, which are in charge of the collection of social insurance contributions from the employer and employees of the private and public sector, the national institute for the Social Security of the self-employed, the national office for family allowances for employees. Finally, there is some complementary information from the national institute of statistics.

The information that is provided by the data set allows us to define different **labour market states at the end of each quarter,** for all workers in our sample. We identify the following labour market states: employment, unemployment and inactivity. The latter is defined by being neither unemployed nor employed. In addition, we have variables which allow us to identify the participation in various labour market policies on a quarterly basis.

A natural starting point for modelling the labour market trajectories of young unemployed workers would be the moment at which they leave schooling. However, the raw data do not allow to observe the workers at this moment. Instead we are able to extract a **flow sample** of all young workers in Belgium, who, during the year 1998, entered paid-unemployment (i.e. unemployment with full unemployment benefits) for the first time, after a waiting period of nine months. In Belgium,

[2]See also Cockx et al. (2004a) and Cockx and Göbel (2005) for research projects which use the data.

school leavers are entitled to full unemployment benefits after such a waiting period. The workers that are considered here have no observed employment experience since they left school. The different chapters are based on samples that contain about 15000 workers, who are between 18 and 26 years old when they start their waiting period.

The duration a worker spends in the labour market states could be influenced by the **period before they enter paid-unemployment**. Some of our explanatory variables are directly related to this period. For example, we have information on the highest school degree, the age of the workers when they entered unemployment after leaving school, the month of inflow into paid-unemployment, and various socioeconomic variables which should cover the main features of the time period before entry into paid unemployment. In addition, all workers in our sample have a nine-months waiting period without employment experience, before they enter paid-unemployment. This ensures that the months before entry into paid-unemployment are similar for all workers in our sample.

The empirical studies in the different **chapters are based on slightly different databases**. In chapter three the observation period is from 1998-2000. Chapter two and chapter four, however, use data from 1998-2001. Moreover certain information has been available only for the later chapters and we applied slightly different procedures to correct for data inconsistencies or missing data. As a consequence, there are small differences with respect to the descriptive statistics and number of transitions in the different databases. Our estimation results are robust to these corrections. In the sequel of this section we provide descriptive statistics that are based on the data which have been used in chapter four, since this data set contains the most comprehensive information.

The data set provides us with a **set of explanatory variables**. First of all, we have a set of variables on individuals characteristics, like the age of the workers, gender, nationality, the highest school degree, the position they have in the household, the number of persons who live in the household for different age classes. In addition, we have regional information, like the local unemployment rate and the region of residence. In chapter three, we also use information for the characteristics

of the most important employer per quarter. We have variables on the sector of the employer and a variable on the size of the company. We include tables with detailed descriptive statistics for these variables in the different chapters.

Descriptive statistics

Now, we provide some introductory descriptive statistics. After a brief statement on the observed characteristics and a discussion of the survival functions, the focus will be on the description of the subsidised employment spell. The latter statistics are complementary to those which are provided in the other chapters.

Table 4.2 in chapter four contains the descriptive statistics for the explanatory variables. A look at this table reveals that on the basis of their observed characteristics the participants seem to be less employable than the individuals who have a direct transition from unemployment into regular employment. This is especially true for the policy24 participants who enter the Recruitment Plan after being in unemployment for at least 24 months.

The **number of participants is relatively low**. We observe 814 transitions from unemployment into participation in contrast to 6487 transition from unemployment into regular employment. One of the main reasons for the low number of participants might be that the Recruitment Plan has never been promoted actively by the Belgian state as a tool to integrate long term unemployed school leavers into the labour market.

In addition, we have demonstrated in section 1.2 that since the employer has to decide between the structural subsidy and the participation in the Recruitment Plan, it is not always beneficial to participate in the Recruitment Plan. Workers with a very low gross wage can be hired with a relative important structural subsidy in the case of non-participation.

Finally, transitions into regular employment can be realised directly after the workers enter paid-unemployment. This is different for transitions into subsidised employment which are not possible during the

first three months after the entry into paid unemployment. Therefore, a mere comparison of the number of transitions into regular employment and the number of transitions into subsidised employment provides a distorted view, since the number of workers who are at risk for participation is lower than the number of workers who are at risk for a transition into regular employment, in our data set.

Descriptive statistics for the survival in various labour market states. In this subsection, we provide a description of the first unemployment spell, the regular employment spell, the subsidised employment spell and finally, the second unemployment spell.

Figure 1.9 shows the survival functions for the different labour market states. The survival function for the first unemployment spell decreases considerably over the observation period, despite the fact that the unemployed workers have already survived the nine months waiting period prior to the considered unemployment spell.

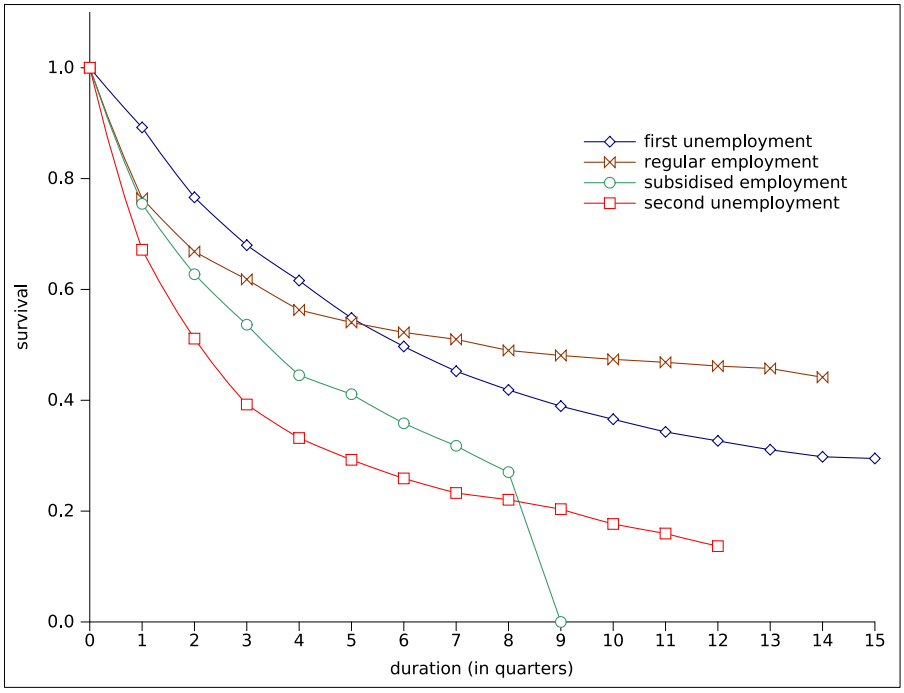
The survival function for regular employment is marked by a strong decrease during the first four quarters of employment duration. At the end of the fourth quarter the survival probability is only 0.56. In the following quarters the survival function stays relatively stable and at the end of the 14th quarter the survival rate is 0.44.

The survival function for subsidised employment decreases even stronger and at the end of the 8th quarter the survival probability is a mere 0.27. This means that many of the participating workers do not stay in the subsidised employment for the maximum duration. At the end of the ninth quarter the survival probability is zero, because of the maximum duration of the entitlement period.

The survival function in the second unemployment spell decreases fast. After two quarters of unemployment the survival probability is already down at 0.51. Consequently, most of the workers who have a second unemployment spell have a transition back to regular employment relatively fast.

Now we focus on the **subsidised employment spell** i.e. programme participation. In total we observe 814 transition into the subsidised employment programme. 491 of the participants receive the subsidy after

Figure 1.9: Survival functions for various labour market spells



Note: the first unemployment spell starts with the flow into paid unemployment.(CHECK the formulation). Here, subsidised employment comprises the policy12 as well as the policy24 scheme.

12-24 months of unemployment (policy12) and 323 participants have been in unemployment for at least 24 months (policy24). The following tables provide a description of how the participants leave subsidised employment over time.

In Table 1.2, we show the percentages of the total number of participants who leave the employment subsidy programme. We distinguish between the two time periods for which different levels of subsidies are provided. During the ninth quarter of the employment subsidy programme the participants have to change their labour market state, because the employment subsidy is provided for a maximum entitlement period of roughly two years. About two thirds of the participants leave subsidised employment during the first year. Over time, the fraction of workers who have a transition into regular employment

Table 1.2: Percentages of the total number of participants who leave the employment subsidy programme

	quarters 1-4 of SE	quarters 5-8 of SE	quarter 9 of SE	total
transitions				
to RE	21.6%	7.9%	12.8%	43.3%
to U	28.9%	3.8%	0.7%	33.4%
censoring	16.0%	8.4%	0.0%	24.3%
total	66.5%	20.0%	13.5%	100%

Note: U is unemployment, SE is subsidised employment, RE is regular employment. Here, we do not distinguish between policy12 and policy24 participants.

increases relative to the transitions into unemployment. In the ninth quarter of subsidised employment the large majority of the transitions are towards regular employment.

This leads us to the question whether the transitions into regular employment are a continuation of employment with the same employer. Our database provides information on the characteristics of the most important employer for each quarter. Table 1.3 shows the percentage of direct transitions from subsidised employment into regular employment that have the same most important employer at the start of the subsidised employment spell as they have at the start of the regular employment spell.

Table 1.3: Percentage of transitions from a subsidised employment spell into a regular employment spell that start with the same most important employer

quarters 0-4 of SE	quarters 5-8 of SE	quarter 9 of SE	total
25.2%	40.7%	89.8%	49.0%

Note: SE is subsidised employment. The *most important employer* is defined as the employer for which the largest share of working time is registered during a quarter.

As mentioned in section 1.2, the Recruitment Plan requires the employment to be at least half-time. This implies that the employer that re-

ceives the subsidy from the Recruitment Plan can be expected to be the most important employer. Nevertheless, the information on the most important employer does not allow to identify *all* transitions into regular employment that are "a continuation of employment with the same employer". For example, if a worker continues the employment with the same employer but changes the employer during the first quarter of regular employment, then the information on the most important employer may be misleading.

In total, almost half of the transitions from subsidised employment into regular employment are to the same most important employer. Moreover, the fraction of the transitions to the same most important employer increases over participation time. In the second year of participation, 40% of the transitions are to the same employer. In the 9th quarter, at the end of the entitlement period, 90% of the transitions into regular employment are to the same employer. These statistics highlight the importance of transitions to the same most important employer at the end of participation in the Recruitment Plan. We will come back to these statistics in section 1.7 where we interpret our results.

1.5 Connections between the chapters

This section provides a detailed **overview of the empirical studies**. Firstly, we provide a general overview and discuss some issues that apply to all empirical studies in this thesis. In a second part of this section we take a detailed look at each chapter separately. We provide a description of each chapter and try to highlight the main differences between them.

We distinguish between the following **labour market states**:

unemployment U is defined as being registered as an unemployed worker at the unemployment office, without any participation in active labour market policies and not being employed.

employment in the subsidy programme SE is defined as employment while the employer receives the subsidy via the Recruitment Plan.

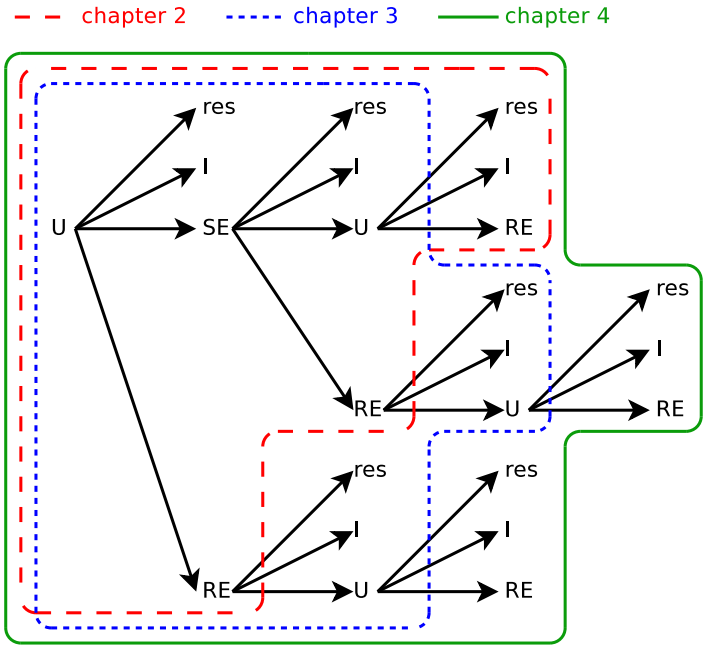
regular employment RE is defined as employment without participation in any active labour market policy.

inactivity I is defined by the absence of information on employment or unemployment in the database, which means that the worker is neither officially employed nor claims benefits as unemployed.

residual state res comprises participation in other active labour market policies and death.

Figure 1.10 provides a chart for all **the labour market flows** in our data set. Moreover, it shows which part of the labour market flows are covered by the different chapters.

Figure 1.10: Labour market flows in chapters 2-4



Note: U is unemployment, SE is subsidised employment, RE is regular employment, I is inactivity, res is the residual state.

All the school leavers in our sample enter paid-unemployment after a waiting period of nine months at the very left of the Figure 1.10. Possible transitions between the labour market states are indicated by the arrows. The dashed line frames the transitions which are covered

in chapter two. The dotted and the solid lines frame the transitions of chapter three and four respectively. Labour market states that are termed identically in Figure 1.10 differ only in the specific sequence of states which leads to them. Figure 4.2 in chapter four provides the number of observed transitions between the labour market states for the flowchart of Figure 1.10.

As a general rule, in this thesis, **transitions to inactivity and to the residual state** are not modelled explicitly. Instead, the respective spells are treated as exogenously **right-censored** at the end of the preceding time period. This decision is motivated by the need to keep the model computationally feasible. From a statistical point of view this requires conditional independence between the timing of transitions of interest and the timing of censoring in order to obtain consistent estimates.

An alternative solution would be to model the transitions into the censoring state explicitly and to allow for dependent transitions into the censoring state. However, in practice, additional restrictions on the multivariate distribution of the unobserved heterogeneity have then to be imposed, in order to facilitate the estimation. (see for example Bonnal et al. (1997)).

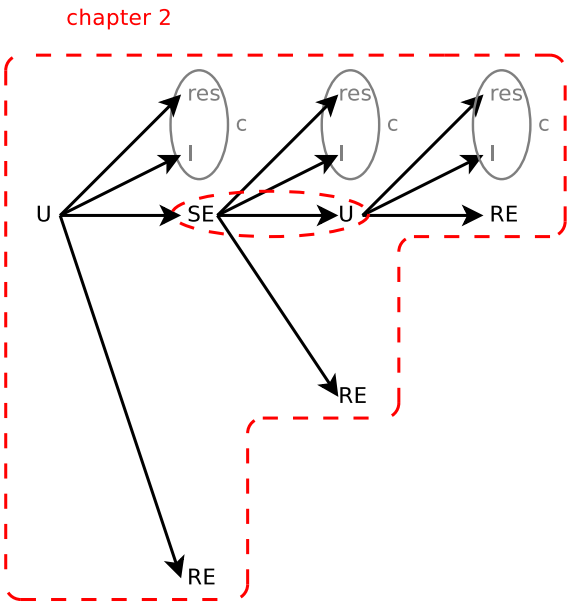
In all chapters, we specify the **unobserved components** of the transition rates between the different states to be destination specific. The idea behind this assumption is that the effect of unobserved characteristics on the transition rates does not depend on the origin state. For example, unobserved characteristics such as motivation may drive the transition into regular employment in a similar way, independently of the current state (i.e. unemployment or programme participation). As a side effect this assumption implies that the effect of programme participation can not vary with unobserved characteristics. We refer to Abbring and van den Berg (2003b) for a model where the treatment effect varies with the unobserved components.

The chapters differ in so far as they cover different labour market states. However, we will see in the following subsections that there are some more fundamental differences between the chapters.

Chapter two:

In **chapter two** we focus on the duration until a transition into regular employment. In the terminology of Abbring and van den Berg (2003b) the "transition of interest" is into regular employment. Figure 1.11 shows the flows between the different labour market states considered here.

Figure 1.11: Labour market flows in chapter two



Note: U is unemployment, SE is subsidised employment, RE is regular employment, l is inactivity, res is the residual state, c indicates censoring.

The labour market flows cover all possible transitions until entry into regular employment. Starting from the first unemployment spell, the workers can either have a direct transition into regular employment or a transition into subsidised employment. We do not explicitly model the possible transition from subsidised employment into a second unemployment spell. In the graph, this is represented by the dashed circle. Instead, we model the transition out of a post-participation state which always starts with subsidised employment and which can be extended by unemployment. Transitions into inactivity or the residual

state are censored, as described above.

For all transitions to regular employment, the parameter estimates for the characteristics of the workers are restricted to be the same. Roughly speaking, participation is modelled as a continuation of the unemployment spell.

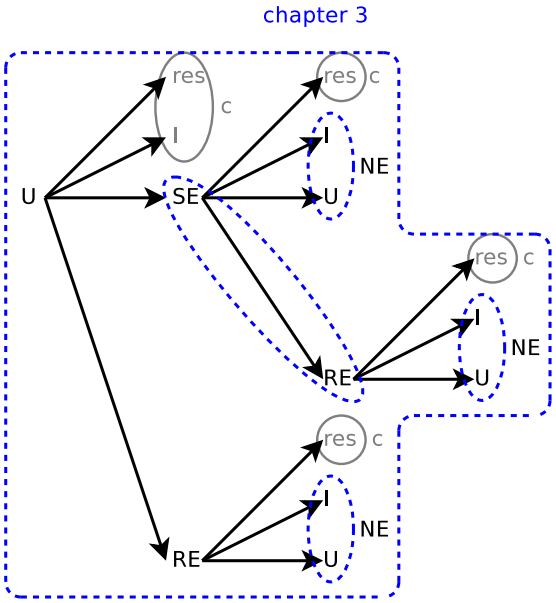
The effect of subsidised employment is captured by a time varying dummy structure for the effect after the transition to subsidised employment. The dummies are used to decompose the effect in three different parts: The effect during the first eight quarters of participation, the effect during the ninth quarter of participation and the effect after participation, i.e. from a second unemployment into regular employment. The effect during the first eight quarters of participation should capture the prematurely ending of the participation in the Recruitment Plan as has been described above, in Table 1.2. We specify a separate effect for the ninth quarter of participation, since the workers have to leave during this quarter if they are still participating in the Recruitment Plan.

Chapter three:

In **chapter three** we focus on the effect of participation on the employment duration. Figure 1.12 displays the flows between the different labour market states that are covered in this chapter.

The considered labour market flows cover all possible transitions until the workers leave their first employment spell. Starting from the first unemployment spell, the workers can either have a transition into regular employment or a transition into subsidised employment. Once in an employment state, we distinguish between transitions out of employment that start with a subsidised employment spell and transitions out of regular employment without any programme participation. We investigate the duration in employment until a transition into non-employment. Here, non-employment is defined as either unemployment or inactivity. Again, this is represented by the dashed circle in the graph. Transitions from unemployment into inactivity or the residual state and transitions from employment to the residual state are

Figure 1.12: Labour market flows in chapter three



Note: U is unemployment, SE is subsidised employment, RE is regular employment, I is inactivity, res is the residual state, NE is non employment, c indicates censoring.

censored.

For the transitions out of employment, the parameter estimates for the characteristics of the workers as well as the baseline hazard are restricted to be the same. Roughly speaking, participation in the Recruitment Plan is modelled like a regular employment spell.

Similar to chapter two, the effect of participation in subsidised employment is captured by a time varying dummy structure. The dummies are used to decompose the effect in three different parts: The effect during the first year of the employment subsidy programme, the effect for the second year and the effect for the period after the end of subsidised employment, i.e. the period in a subsequent regular employment spell.

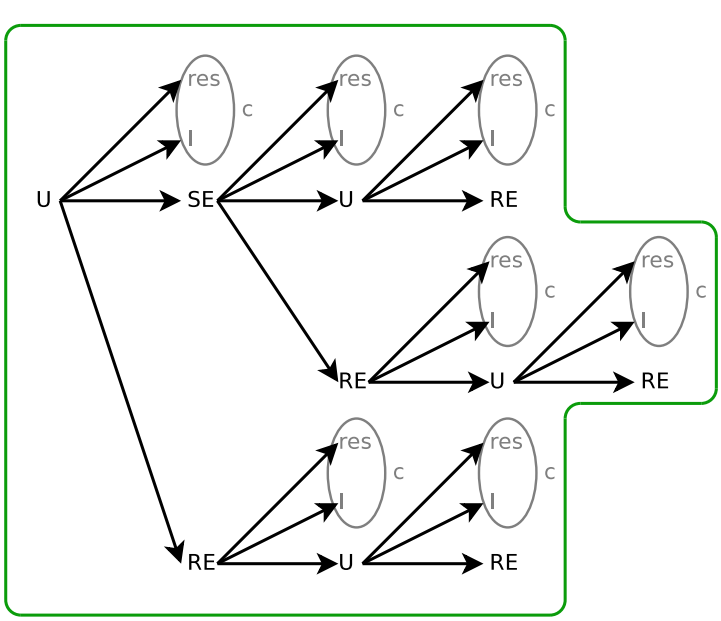
The distinction between the effect of the first and the second year of subsidised employment is motivated by the different levels of subsidies which are provided for these time periods. As mentioned above,

the transition from subsidised to regular employment is not modelled explicitly, in chapter three. Instead, regular employment that follows directly after subsidised employment is treated as a continuation of the same employment spell.

Chapter four:

Chapter four extends chapter two as well as chapter three by integrating additional labour market flows. Figure 1.13 displays the flows between the labour market states that are covered in chapter four.

Figure 1.13: Labour market flows in chapter four



Note: U is unemployment, SE is subsidised employment, RE is regular employment, I is inactivity, res is the residual state, c indicates censoring.

The covered labour market flows extend those covered in chapter three by the labour market flows out of a second unemployment spell. Using this framework, we can derive estimation results which are similar to those of chapters two and three. Furthermore, we are able to estimate the effect of a former participation on the duration of the second

unemployment spell, which was not possible before. Different from chapter three, all transitions into inactivity or the residual state are censored. Apart from this exception, in chapter four, we do not group labour market states. All the transitions which are not censored are modelled explicitly.

This has consequences: Even though this chapter includes the labour market flows of chapter two and three, we hardly derive estimates which can directly be interpreted as the effect of participation. The estimates for the effect of participation vary over time and with the characteristics of the workers. An exception to this rule is the lagged duration dependence, i.e. we include dummies which capture the effect of a former participation.

In chapter four we, again, impose some restrictions. Parameter estimates for explanatory variables and the baseline hazards are the same for all the transitions out of the first regular employment spell. The same applies to the second unemployment spell. The effect of previous participation on the duration of a labour market state is covered by dummies.

This does not mean that the effect of participation does not vary with the observed characteristics and over time. The variation of the effect is due to the fact that the time dependence as well as the parameter estimates for the explanatory variables are different for the case of participation and the hypothetical case of non-participation.

There are more differences between chapter four and the other chapters. Firstly, in chapter four we also consider participation in the policy24 scheme, which has been neglected in chapters two and three. Moreover, we do not estimate the effects for male and female workers separately.

Different from chapter two, the estimation results allow us to simulate how the effect of participation varies over time and with the characteristics of the workers. The differences to chapter three are more substantial: Firstly, in chapter four we do not include the characteristics of the employer. Moreover, we derive results which allow us to draw conclusions about the time structure of the effects on a quarterly basis. Finally, we analyse the transition from employment to unemployment

and not as previously the duration in employment until a transition into non-employment.

1.6 Key results

In the following, we summarise the findings of the different chapters. The aim of this section is to provide an overview of the key results. For an interpretation of the results and the relation between the findings and the economic theory, we refer to section 1.7.

As mentioned before, in **chapter two** we estimate the effect of participation on the duration until a transition into regular employment. The results of this chapter are in comparison to a situation where the worker would have stayed in unemployment instead of the transition into subsidised employment. We use time varying dummies to decompose the effect in three different parts: The effect during participation, the effect at the end of participation and the effect after participation.

We find that subsidised employment has no significant effects during participation, except for those workers who stay in subsidised employment for the maximum duration of two years, when most of these workers have a transition into regular employment. In addition, the transition rate into regular employment is significantly higher as a result of a former participation. These results apply for both, male and female workers.

Furthermore, the estimates suggest that the effect on the transition rate into regular employment increases with a low level of education and is higher for regions with poor economic performance. We provide simulation results for the effects of the programme on the duration in unemployment.

In **chapter three** we estimate the effect of participation on the employment duration. Here we contrast the duration of an employment spell that starts with subsidised employment to a spell that starts with regular employment. We use time varying dummies to decompose the effect in three different parts: The effect during the first year of the employment subsidy programme, the effect for the second year and the

effect for the period after the end of subsidised employment.

Our estimates indicate that the policy decreases the transition rate from employment to non-employment in the first year of participation. Consequently, the expected duration in employment is longer as a result of participation in the employment subsidy programme compared to the hypothetical case of a regular, non-subsidised employment spell. We find no significant effect on the transition rates out of employment in the second year and after participation. When we control for selection in observed *and* unobserved characteristics we do not find significant effects anymore.

In **chapter four** we estimate an event history model which allows to derive effects on various duration outcomes. Different from chapter two and three, we also include policy24 into our analysis, and we merge the male and female subsamples.
We find that participation in subsidised employment

- significantly shortens the duration until regular employment, as compared to a situation where the worker would have stayed in unemployment instead of the transition into subsidised employment.
- has a significant positive effect on the employment duration, as compared to a situation where the worker would have had a regular employment spell instead of a subsidised employment spell.
- has no significant effects on the second unemployment spell after participation, as compared to the duration of the second unemployment spell after a regular employment spell (without participation).

Our simulation results suggest that subsidised employment has larger effects on the duration until regular employment for workers with unfavourable characteristics.

We will demonstrate in the next section that the **results** of the different chapters **are complementary**. In chapter two and three we decompose the effect for different time spans. This allows us to draw some

conclusions about the way in which participation in the Recruitment Plan affects the durations of interest. Chapter four enables us to investigate the dynamics of the effect on various durations, on a quarterly basis. Moreover, chapter four provides evidence on the effect of a former participation on the duration in a second unemployment spell.

1.7 Interpretation of the results

In this section we interpret the results of the different chapters. In a first step, we outline theories which are likely to explain why participation in an employment subsidy programme may have an effect on the investigated duration outcomes. In a second step, we investigate how our results are related to these economic theories.

Before we start to specify the different theories, we would like to clarify what kind of economic theories are appropriate for the explanation of our results. Generally, the setup of temporary employment subsidy programmes for disadvantaged workers is motivated by the aim to lower the labour costs for this group. This should provide incentives for potential employers to hire more disadvantaged workers. In other words, a temporary employment subsidy aims to compensate for the disadvantage of these workers. However, it is not clear whether participation in a temporary employment programme affects the integration into the labour market. For example, it is possible that the participating workers loose their jobs at the end of participation, since the programme does not compensate for their disadvantage any more. As explained in section 1.3, we use different duration measures to evaluate the effect of participation on the integration of the workers into the labour market. Therefore, we focus on economic theories that are able to explain why participation in temporary employment subsidy programme could affect these duration outcomes.

Economic theories

Compared to a situation where a worker stays in unemployment, participation in the Recruitment Plan offers a subsidised employment ex-

perience. This employment experience could affect the integration of the worker for the following reasons.

If workers accumulate more (or lose less) **human capital** during employment than during unemployment, then participation in subsidised employment can be expected to improve future employment prospects. In the case of a *first* employment experience the accumulation of human capital is likely to play an important role. For example, if we think about experience as a factor that contributes to the accumulation of human capital in a production function framework, it would be reasonable to assume decreasing returns to experience. In line with this idea, Light and Ureta (1995) provide estimates which show that at the start of the career the wage is increasing faster, which can be interpreted as a results of human capital accumulation at the beginning of the career. Also Richardson (1997) provides arguments on human capital accumulation on the job.

Furthermore, participation in a subsidised employment programme could reveal information on actors of the labour market. Employers could use the subsidised employment as a **screening device** or participation could provide valuables **signals to future employers**, showing that the worker is willing and/or able to work. On the other hand, programme participation might act as a negative signal, especially if participation is associated with low productivity. McCormick (1990) and Ma and Weiss (1993) provide arguments for signalling, in the context of employment.

Moreover, workers might search less for a regular employment while participating in the subsidised employment compared to a situation where they are unemployed. If this is the case then participants could virtually get **locked in** (van Ours (2004)) while participating in subsidised employment and consequently, have low transition rates into regular employment.

A priori, the theories we have mentioned until now apply to *all* types of employment. Therefore, they are **not very useful for our analysis of chapter three**, where we contrast subsidised to regular employment. To our knowledge, the only theoretical paper which delivers

insights for this case is that by Mortensen and Pissarides (2003) who analyse the effect of different types of subsidies on job creation and job destruction by integrating subsidies in a **search and matching equilibrium framework with endogenous job destruction**. In their analysis they distinguish between two types of subsidies. *Hiring subsidies* paid once, at the start of an employment spell and *employment subsidies* which provide a flow of subsidies during the job duration. Their main findings can be summarised as follows: hiring subsidies lead to shorter unemployment durations but increase unemployment incidence and consequently, lead to a higher turnover on the labour market. In contrast, employment subsidies lead to a steady state that is characterised by a lower reservation productivity, which leads to an increase of the expected employment duration.

A *temporary* employment subsidy shares characteristics of both types of subsidies and could therefore be regarded as a policy which lies in between hiring subsidies and permanent employment subsidies. During the subsidy, the situation is similar to the case of a permanent subsidy: the flow of subsidies can be expected to lower the reservation productivity and would consequently, lead to a lower transition rate out of employment. Similar to a hiring subsidy, a temporary employment subsidy increases the opportunity cost of maintaining a match after the end of the subsidy. This is due to the fact that the employer could lay off and search another worker who is entitled to the subsidy.

When the intuition of this model is translated into our empirical model then we would expect lower transition rates out of employment during a temporary employment subsidy and higher transition rates out of employment after the end of the subsidy.

The preceding arguments show that participation in subsidised employment could affect the employment duration, as compared to regular employment. A **change of the employment duration** could theoretically have an effect itself. For example, **human capital** and professional networks are likely to increase as a function of employment experience. Consequently, participation in subsidised employment could have an effect on the duration in a subsequent employment or unem-

ployment spell.

Unfortunately, there is no theory which integrates all theoretical arguments into a unifying framework. This framework would be dynamic in a non-stationary sense, integrate the decisions on the employer and employee side, and should allow to derive clear cut results on how the different transition rates evolve over time.

Interpretation of our findings

The simulation results of chapter two and chapter four both show that **participation significantly shortens the duration until** a transition from unemployment into **regular employment**. This result is obtained **in contrast to a situation where the worker would stay in unemployment instead of the transition into participation**.

We conclude that the employment experience provided by participation in the employment subsidy programme seems to have a major impact on the integration of the workers. The positive effects, provided by the accumulation of human capital or signalling seem to outweigh possible negative effects which could lead to locking in during participation. The similarity in the magnitude of the results of chapter two and four suggests that the findings are not sensitive to the inclusion of the policy24 scheme into our analysis.

The results of chapter two provide some insight into the way in which this effect is realised:

- Firstly, the dummy which captures the *direct transitions* from subsidised employment into regular employment is not significant. This points either to the **absence of the locking in effects** or equivalently to the balance of positive effects (e.g. provided by the accumulation of human capital or signalling) and negative effects (e.g. as a result of a low effort for job search).

- Secondly, we have a **large significant coefficient for the transitions into regular employment** in the *ninth quarter* of participation, **when the employment subsidy programme ends**. In addition, the descriptive statistics in section 1.4 suggest that most

of these transitions are to the same employer. It seems, therefore, that a part of the **employers use the Recruitment Plan as a screening device** - where they hire long term unemployed workers and they are willing to continue the employment beyond the programme.

A related observation is that there are few layoffs in the ninth quarter of participation, which is in **contrast to the search and matching equilibrium theory**, which suggests that employers may separate from former participants, in order to hire new, subsidised workers. It is possible that the worker or employer have invested into firm specific human capital, during participation. This would make a separation after the end of participation more costly than suggested by the search and matching equilibrium model.

The structural subsidies for workers with a low wage might also help to explain this result, since even after the end of participation the employment can still be subsidised. In section 1.2 we have demonstrated that for workers with a low gross wage the structural subsidy can be considerable.

- Finally, the estimates indicate that the **transitions into regular employment are significantly accelerated *after* participation**, for the group of participants who do not have a direct transition from subsidised employment into regular employment. We would like to recall that this results applies compared to a situation where the worker would have stayed in unemployment instead of the transition into subsidised employment. **Signalling and the accumulation of human capital** are likely to play a major role for the explanation of this result. Since only general human capital can be transferred to other employers, here, we expect signalling theory to play a more prominent role, than for the direct transitions from unemployment into regular employment.

Now, we are going to look into how the effect of participation in the employment subsidy programme compares to a regular employment experience.

In Chapter three and four, we find that participation leads to a **longer employment duration, as compared to** a **regular employment** spell. The result on the transition rate out of employment manifests at the start of the employment spell. This **corresponds roughly to the predictions of the search and matching equilibrium model** which suggests that the employment duration can be expected to be longer during subsidised employment. The latter result means that compared to a hypothetical case where the workers would have had a regular job instead of participation, the employment subsidies enhance the integration of the worker by the provision of a longer employment experience.

However, a **former participation has no effect on a subsequent unemployment spell**, **compared to a former regular employment experience**. The latter result points to the similarity between the employment experience that is provided by subsidised and by regular employment. The longer expected employment experience and the **consequential additional accumulation of human capital or improved signalling do not seem to have major impact on the duration in the subsequent unemployment spell**. Possibly, the difference in the employment duration is too small to have a measurable impact.

1.8 How can the results guide employment policy?

In this section we try to see how the different results provided in this thesis can guide employment policy.

Employment subsidy programmes are helpful for the integration of long term unemployed school leavers. As we have seen in section 1.6 and section 1.7, participation in the subsidised employment programme significantly shortens the duration until a transition into regular, non-subsidised employment. Moreover, we provide evidence for the effects to be stronger for workers with unfavourable labour market characteristics.

The results from chapter three and four show that the duration in subsidised employment can be expected to be longer than that of reg-

ular employment. These findings suggest that participation in subsidised employment has a positive effect on the integration of long term unemployed workers, compared to a hypothetical case of regular employment. Moreover, this result means that even in a case where the worker would have had a regular job anyway, in the absence of participation, the integration of the participants can be enhanced by lengthening the employment experience.

Finally, we find that a former participation in subsidised employment has the same effect on the duration in a subsequent unemployment spell as a former regular employment spell. If it is indeed the aim of an employment subsidy programme to integrate the participants into the labour market, then this is a desirable result for the following reason. After a first employment spell, workers have a relatively high transition rate from a subsequent unemployment spell into regular employment. This points to the general importance of a first employment experience for the integration into the labour market, for school leavers.

Our results clearly suggest that employment subsidy programmes can be an adequate tool for the integration of long term unemployed workers without employment experience.

Targeting employment subsidy programmes is likely to be a promising strategy The existing literature shows that employment subsidies work relatively well for "normal" jobs, in the private sector. Even though we don't investigate this question directly, our results are in line with the finding that participation in subsidised employment in normal jobs has a positive effect on the integration into the labour market. Moreover, our results show that participation in subsidised employment has more desirable effects for subgroups of workers with unfavourable characteristics. Based on this result, we recommend the targeting of employment subsidy programmes on the private sector and on workers with particularly unfavourable characteristics.

As argued in chapter four, it is possible that we find a positive effect for participation because we analyse the participation of school leavers. We argue that a first employment experience might be of special importance for this group. If this is indeed the case, then it is likely that we

would find similar positive results for other workers who have been out of the labour market for an extended time period, e.g. workers who made an extended professional break in order to care of their children or workers who have been in prison or ill for several years. These workers might have difficulties to find a regular employment at the same level as before. Participation in subsidised employment could facilitate the integration into the labour market, by helping the workers to accumulate human capital (e.g. getting used to computers or re-adapt to an employment relationship) and provide a positive signal to future employers.

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