To my family

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List of abbreviations

CEECs – Central-East European Countries
CIS – Commonwealth of Independent States
CMEA – Council for Mutual Economic Assistance
CPI – Corruption Perception Index
EBRD – European Bank for Reconstruction and Development
EFTA – European Free Trade Association
EPL – Employment Protection Legislation
ESA – Employment Service Agency
EU – European Union
EU-8 – The 8 countries that joined European Union in May, 2004
FDI – Foreign Direct Investment
FSU – Former Soviet Union
FYROM – Former Yugoslav Republic of Macedonia
GDI – Gross Disparity Index
GDP – Gross Domestic Product
GNI – Gross National Income
GNP – Gross National Product
ICLS – International Conference of Labour Statisticians
ILO – International Labour Office
IMF – International Monetary Found
IOM – International Organisation for Migration
LFS – Labour Force Survey
NAIRU – Non-Accelerating Inflation Rate of Unemployment
NDI – Net Disparity Index
NRU – Natural Rate of Unemployment
OECD – Organisation for Economic Cooperation and Development
OST – Optimal Speed of Transition
SEECs – South-East European Countries
UN – United Nations
US – United States
WB – World Bank
WDI – World Development Indicators

PREFACE

Few other themes in the theoretical and empirical literature of Economics have attracted as vast a scientific attention as the process of transition from a centrally-planned to market economy. Though transition can be assessed in each of the economic, political and social dimensions, the present research focuses on its economic aspects with an emphasis upon labour market performance. Taking into account the focus of this research, the political and social aspects of transition have not been detailed, although they have been equally important and closely related to the economic dimension. More specifically, we are interested in assessing the unfavourable labour market outcomes in South-Eastern European Countries generated by the processes of ownership restructuring and labour reallocation.

Not all transition countries have been equally successful in managing the transitional transformation due either to differences in the initial conditions, contextual differences or the types and timing of policies adopted. Transition countries are a heterogeneous group, differing in their experiences as well as in their degrees of success in achieving transitional reforms. The Central-East European countries (CEECs) and Baltic states have been the most successful in overcoming the initial recession, experiencing a stylised U-shaped trend in GDP and employment growth. In contrast, most of the members of the Commonwealth of Independent States (CIS) and South-East European countries (SEECs) are still struggling with high and stagnant unemployment which stems from their low institutional capacity and modest output growth. In our study we focus on the latter group of countries, paying particular attention to the case of Macedonia.

The emergence of open unemployment at the outset of transition was one of the most evident side-effects of transition and, to our knowledge, represents a historically unique event. The initial 'transitional unemployment' differed in several aspects from other types of unemployment in that it was characterised by pronounced labour market segmentation, long average duration of unemployment and a low probability of exiting unemployment into employment. Given the depressed

characteristics of SEECs labour markets, the traditional western form of adjustment was coupled with other mechanisms, such as growing employment in the informal sector, non-participation and emigration. With respect to this, governments in transition countries have faced a challenging task in developing modern labour market institutions and providing an appropriate welfare system for their citizens.

Having in mind this context, we have addressed several research questions that motivated us throughout the research. First, how can we define the sustainable rate of unemployment with respect to the characteristics of the labour markets in transition countries? Second, how do different policy packages and particularly passive labour market policies influence that sustainable rate of unemployment? Third, what is the role of the less traditional labour market adjustment mechanisms in determining labour market outcomes? Fourth, how can different labour market equilibria be explained? And finally, which measures should be recommended to the policy-makers in order to improve labour market conditions and ultimately reduce the unemployment rate. The thesis consists of eight interrelated chapters. We next briefly outline the contribution of each chapter in developing answers to these research questions.

In Chapter 1 we present, as a starting point of our research, a general overview of labour market trends in transition countries, and particularly in Macedonia. Although we analyse several labour market issues concerning employment and participation, we pay special attention to analysis of the nature of, and trends in, unemployment. The second part of this chapter examines the characteristics of passive labour market policies in transition countries. According to the existing labour regulation, the generosity of unemployment benefits is assessed in terms of eligibility criteria, duration, replacement rates and coverage. Furthermore, we provide an explanation for the disparity between the estimate of unemployment based on the Labour Force Survey (LFS) and that based upon the registered unemployed. We argue that disparity between these measures of unemployment largely reflect deficiencies in the unemployment benefits system. In addition to the LFS to registered ratio, we construct two novel indices that help us to investigate the difference between LFS figures and registered number of unemployed.

In Chapter 2 we critically assess two different strands of the literature concerning labour market equilibria: the Non-Accelerating Inflation Rate of Unemployment (NAIRU) and Optimal Speed of Transition (OST). By analysing the

determinants and policy implications of NAIRU we arrive at the conclusion that this concept is not applicable in the case of the more backward transition countries. Furthermore, our survey of the assumptions, key mechanisms and policy implications of the OST models highlights some shortcomings which suggest that they cannot be *per se* used in the determination of the sustainable rate of unemployment in SEECs. As prerequisite for our later research, we develop a conceptual framework in which we formulate a more appropriate definition of the sustainable rate of unemployment. In addition, we explicitly state our main research questions and introduce and justify the methodology that we pursue in developing our answers.

Chapter 3 provides an assessment of the labour market flows in transition countries with specific reference to Macedonia. As our main tool for analysis we use an adapted stock-flow model in which employment in the private sector is considered as a distinct labour market state. Furthermore, we construct a stylised picture that simultaneously represents the dynamics on the demand and supply side of the labour market, according to which the transition process can be roughly divided into two phases with apparently different labour flow characteristics. In the initial phase of transition the flows mainly occurred from the declining state sector into unemployment, whilst the second phase has been characterised by a gradual growth of employment in the private sector. Our analysis of Macedonian labour market flows helps us to identify that the underlying cause of its stagnant unemployment pool and increased incidence of 'discouraged workers' phenomenon is the low outflow rate from unemployment to employment, creating a 'bottleneck' in the labour market.

In Chapter 4, Chapter 5 and Chapter 6 we separately assess three alternative labour market adjustment mechanisms: employment in the informal sector, non-participation and emigration respectively. For each of them, we provide analyses of their origins, their main characteristics, as well as their consequences for labour market outcomes. For this purpose, we use officially published data from surveys and censuses and apply the standard tools of empirical analysis such as multiple regression and gravity models. Furthermore, we identify the role these labour market adjustment mechanisms play in Macedonia, compared to their general trends in the rest of transitional world. The investigation of the level of association between the unemployment and these other labour market adjustment mechanisms is of particular importance since it enables us to identify their capacity to absorb part of the unemployed workforce. Additionally, we investigate the possible overlap between

these labour market adjustment mechanisms, *i.e.* their interactions in cushioning the economic and social consequences of persistent unemployment and their possible fiscal implications. The results obtained from these assessments are later used as a basis for integrating the labour market adjustment mechanisms within our model of sustainable rate of unemployment.

In Chapter 7 we formally model the sustainable rate of unemployment in transition countries by drawing together our analyses of labour market phenomena. We fill the gap in the literature by building a model that brings together the interaction between passive labour market policies and labour market adjustment mechanisms. In our comparative static analysis we examine the interactions between job creation, market wages and participation decisions in the context of SEECs and consider the possibility of multiple equilibria. For this purpose we calibrate our model with parameter values that correspond to our findings in the previous analyses. In using the model we attempt to mimic the features of a depressed labour market, characterised by weak job creation in the formal sector. In addition, we perform dynamic simulations of labour market evolution over time and explore the nature of alternative outcomes by assuming different policy scenarios.

Finally, in Chapter 8 we summarise our main findings, identify the contribution to knowledge made in our research and set directions for the future policy development in SEECs. In this context, we separately formulate recommendations for passive labour market policies and policies targeting labour market adjustment mechanisms that could be jointly undertaken as a complementary policy package. Concerning passive labour market policies, we concentrate on improvements in unemployment benefit administration and argue that policies toward the adjustment mechanisms should be designed with respect to their potential for supporting effective job creation in the formal sector. In summary, the proposed policy package should be designed to encourage labour supply and strengthen job creation in the formal sector by gradually reducing the role of the non-traditional adjustment mechanisms. We hope that the policy package championed in our research, together with other policies such as active labour market policies and reforms to the education system will improve labour market conditions and eventually decrease unemployment in Macedonia.

CHAPTER 1

LABOUR MARKETS IN TRANSITION: THE CASE OF MACEDONIA

1.1 Introduction

One of the most important development goals of economic policy is the goal of full, productive and sustainable employment, *i.e.* employment for all those who are able to work, wish to be employed and actively looking for a job. This commitment becomes even more pronounced in the case of transition economies where economic shocks have contracted the level of employment and redistributed wealth. Having in mind the social implications of persistent open unemployment manifested in rising poverty and social exclusion, all transition countries have placed unemployment reduction among their most important macroeconomic goals. However, policy

measures intended to reduce unemployment have to be based upon previous comprehensive analyses of the labour market characteristics and have to be implemented by credible governments (Boeri, 2000; Kornai, 2006).

In the circumstance when unemployment is high, the compensation for the unemployed via the design of appropriate passive labour market policies gains in importance. Alongside their role as automatic stabilisers, the economic rationale for analysing passive labour market policies can be viewed first, by their impact on individual decision-making concerning labour force participation and second, by their budgetary implications. With respect to the above arguments, the aim of this chapter is to provide empirical assessment of the labour market characteristics in transition countries by shedding light on the insufficiently explored issues such as the nature of unemployment and passive labour market policies. With respect to this, the transitional world demonstrates enormous diversity. Some of transition countries such as the Central Eastern European countries (CEECs), Baltic countries and Slovenia have successfully achieved the process of transition and have become EU members.[1] In contrast, other transition countries such as The Commonwealth of Independent States (CIS) and South-Eastern European countries (SEECs), called 'lagging reformers', are still facing significant reform challenges. In our analysis we focus our attention on SEECs and particularly Macedonia.

The chapter is structured as follows. In section 1.2 we present the main stylised facts about the labour markets in transition countries. In the following section 1.3 the emphasis is on how macroeconomic trends and policies have influenced the characteristics of the Macedonian labour market. Within this framework we examine the pre-transition Macedonian labour market, the role of macroeconomic policies and the impact of privatisation on labour market outcomes. In section 1.4 we pay attention to Macedonian labour market trends, such as labour force structure, employment and unemployment with the purpose of identifying the extent to which the characteristics of the Macedonian labour market resemble those of the rest of the transitional world. In addition, we provide a rationale for the analysis of passive labour market policies and in this context, in section 1.5 we undertake a comprehensive assessment of unemployment benefit systems in transition countries, whilst the Macedonian unemployment benefits system is critically assessed in section 1.6. In section 1.7 we

[1] We refer to this group of countries as EU-8 because it consists of 8 new EU members: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and, Slovenia.

explore possible deficiencies of the passive labour market policy design by analysing the disparities between different measures of unemployment, again concentrating upon the case of Macedonia. Finally, in section 1.8 we present concluding remarks that will be further used as guidelines for our research agenda.

1.2 Stylised facts about labour markets in transition countries

The process of transition in the former socialist countries, which started at the beginning of 90's, has had tremendous economic, political and social impact. Transition is a multidimensional process, which includes systemic change in a number of spheres in the society. According to Balcerowicz (2001), this transition can be analysed by using a simple analytical scheme that includes: (i) the initial/inherited conditions, (ii) developments of peculiar factors, (iii) the nature of government policies and (iv) outcomes/performance. Bearing in mind this scheme, one can observe great variation in the sequencing, speed and content of reforms among the transition countries (Gomulka, 2000; Svejnar, 2002a; Godoy and Stiglitz, 2006). Some of them such as the EU-8 countries represent examples of successful transformation from a centrally-planned to market economy, whereas others are still struggling with substantial economic problems.

The initial transitional recession has *inter alia* manifested salient effects on the labour market performance. As in the case of the macroeconomic analysis, labour market outcomes can be assumed to be result of number of factors such as inherited conditions, the nature of policies and/or other independent factors. Generally, the transitional reforms initially had negative effects on labour markets, which were manifested in declining participation rates and in persistent high unemployment. Mickiewicz and Bell (2000) call this unemployment that arose as a response to the shock of systemic reforms 'transitional unemployment', which in several aspects differs from other types of unemployment. In this context, later in this chapter we focus on the specific nature and characteristics of unemployment in Macedonia.

The transitional period with respect to macroeconomic performance can be divided into two phases. The first phase, also known as 'transformational recession' was characterised by a weak performance of the transition economies, mainly reflected in falling output and increased unemployment and inflation. The second phase was characterised by macroeconomic stabilisation and economic recovery. As a

consequence, in most transition countries we can observe a so-called U-shaped trend in evolution of the gross domestic product (GDP) and industrial production (Boeri and Terrell, 2002). However, as mentioned before, not all transition countries have followed the same development pattern throughout transition. Some of them decided on rapid reforms, while others adhered to the gradualist approach (Roland, 2000; Tichit, 2000; Fisher and Sahay, 2001; Svejnar, 2002a). In most cases, greater initial structural reforms resulted in deep recessions in the short-run but, in better macroeconomic performance in the long-run (Balcerowicz, 2001; Kornai, 2006).

According to Blanchard (1997) in the context of labour market performance, the process of transition has been mainly led by two driving forces: ownership restructuring and sectoral reallocation. These processes respectively assume a large-scale transformation of state owned firms into privatised ones and, a reallocation of a substantial part of the labour force from the manufacturing and agricultural sectors towards the expanding service sector. The experience in almost all transition countries, as we will demonstrate in Chapter 3 shows that the creation of new jobs in the emerging private sector was not initially strong enough to absorb the mass of workers laid-off from the restructured state-owned firms. At the same time, the mismatch between the skill requirements of newly created jobs and effective skills owned by the workers has become a substantial problem (Svejnar, 2002b). Consequently, the labour markets in early transition became less dynamic with a relatively stagnant unemployment pool leading to increases in unemployment and especially long-term unemployment (Cazes and Nesporova, 2003).

As in the case of general macroeconomic indicators, transition countries do not represent a monolithic group in terms of initial labour market performance. Three groups of countries have been distinguished according to the way labour markets adjusted after the initial transitional shock. The first group consists of CEECs and Baltics where adjustment to the decline in output was mainly achieved by an increase in unemployment, while the second group of countries comprises the CIS, where adjustment was mainly conducted by a decrease in real wages and continued labour hoarding[2] (Barr, 2001; Boeri and Terrell, 2002; Cazes and Nesporova, 2003; Bragin and Osakovsky, 2005a). The SEECs can be distinguished as a third group of transition countries with respect to their labour market outcomes during transition.

[2] According to Mickiewicz (2005), labour hording is defined as employment above the technically efficient level.

The labour market adjustment in SEECs immediately after the initial shock was similar to that observed in CEECs *i.e.* characterised by a sharp increase of unemployment. However, unemployment in SEECs in the second phase of transition has demonstrated considerably higher persistence than in the CEECs, which deserves to be explored as a separate form of labour market adjustment. Most of the analysts of SEECs labour markets attribute their bad performance to various factors that can be observed in number of fields, such as political instability, high levels of corruption, obsolete infrastructure, insufficient institutional capacity, high payroll taxes, large shadow economy etc. (Minassian, 2002; Köse and Karadeniz, 2004; Micevska, 2004). All these factors create an unfavourable macroeconomic climate and obstruct the further improvement of labour market performance. In this chapter we will disentangle the reasons for the peculiar adjustment pattern in Macedonia by presenting the relevant empirical evidence.

1.3 The Macedonian labour market in its macroeconomic context

The disintegration of Yugoslavia leading to creation of six new countries[3] coincided with the start of the transitional process from centrally planed to market economy. Since the proclamation of independence of Macedonia on September 8, 1991, the transitional process as a multidimensional phenomenon has affected every domain of the political, economic, and social life in the country. In the economic sphere, transition has been characterised by a change in the ownership of capital, liberalisation of goods and capital markets, liberalisation of the foreign economic relations, radical change in the role of the state in the economy, and the creation of a less regulated labour market. In the sphere of social life, transition has led to rising income inequality, a weakening of the middle class and social exclusion of vulnerable social groups. Politically, the transition has been accompanied by the creation of a democratic society, differentiation of power into legislative, executive and judicial branches, the creation of a pluralistic political system and implementation of public and democratic elections (Pechijareski and Rocheska, 1998). Before analysing the macroeconomic trends and the impact of macroeconomic policies and privatisation on

[3] The countries that originate from former Yugoslavia are: Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia and, Slovenia.

the Macedonian labour market, we present an overview of the labour market characteristics before transition.

1.3.1 The labour market characteristics before transition

In general, in former socialist countries markets did not exist because they were ideologically considered as the characteristic of the western-type economy. As in other domains of the economy, the labour market was not formally recognised and all issues concerning labour allocation were centrally planed by the state. In addition, labour market institutions were not present or operated only in a partial manner, failing to support the key role of improving the effectiveness of labour allocation.

Considering the issue of labour allocation in the pre-transitional era, former socialist countries did not recognise the concept of open unemployment (Svejnar, 1999). Centrally planned socialist economies tried to suppress the existence of unemployment by forcing over-employment on the state-owned enterprises. The primary goals of unemployment suppression were: (i) alleviation of the social tensions engendered by the problem of unemployment and (ii), creation of an ideology regarding the socialist regime as a superior type of economic, political and social system. This policy had a considerable deteriorating effect on the level of productivity, which made socialist firms less competitive in world markets. Productivity was further affected by the associated wage compression which prevented a more efficient rewarding of workers with different levels of education and skills.

However, a careful analysis leads to the conclusion that former Yugoslavia (including Macedonia) was an exception because labour allocation was different from the rest of the socialist block (Slaveski, 2001). The concept of self-management and the decentralised nature of the Yugoslavian economy contributed to more liberalised relations in the labour market on both the supply and demand sides. The demand for labour was freely created by firms, while hiring was conducted mainly through the local state employment offices. Consequently, open unemployment, as a form of failure of labour market functioning in former Yugoslavia existed even before transition, though as elsewhere the transitional shock led to an increase in the unemployment rates (Boeri, 1997; Rutkowski, 2006).

Besides its high rate of unemployment, the Yugoslavian economy experienced a high regional diversity in the rates of employment and unemployment.[4] Traditionally, the more developed North, including Slovenia and Croatia, had higher rates of economic growth, which induced higher employment rates. On the other hand, the 'poor South', which comprised southern part of Serbia and Macedonia, achieved significantly lower rates of economic growth and employment. The labour force in Yugoslavia manifested a high level of geographical mobility inside the country. In addition, emigration to the more developed western countries started to play an increasingly important role, a trend which has continued into the present. We explore the phenomenon of emigration as a specific labour market adjustment mechanism in Chapter 6. A deep economic and political recession characterised by the poor performance of the Yugoslav economic, social, and political system developed at the end of the 80's, which further aggravated the problem of unemployment. The epilogue of the late 80's economic and political recession in Yugoslavia was the breakdown of the Federation and creation of new independent states among which was Macedonia.

Macedonia entered the process of transition with a very unfavourable situation in the labour market. For instance in 1990, the year considered as the starting point of transition, the rate of unemployment was 23 percent[5], which was extremely high compared to other developing countries at that time. The main reason for such a high rate of unemployment was the specific structure of Macedonian economy and the lack of growth centres for economic development. A considerable part of the Macedonian employed labour force was attached to non-competitive low productivity sectors such as the textile industry, wood processing industry, mining etc. Furthermore, there were no substantial investments in new technologies or in the final processing industries because of various political and economic reasons. First, as a small part of former Yugoslavia, Macedonia was not a sufficiently strong political entity to influence national developments. Second, the Macedonian infrastructure, as an important factor for the allocation of new investments, was obsolete and inferior to that in the more developed regions. More recently, numerous wars and political instabilities in the

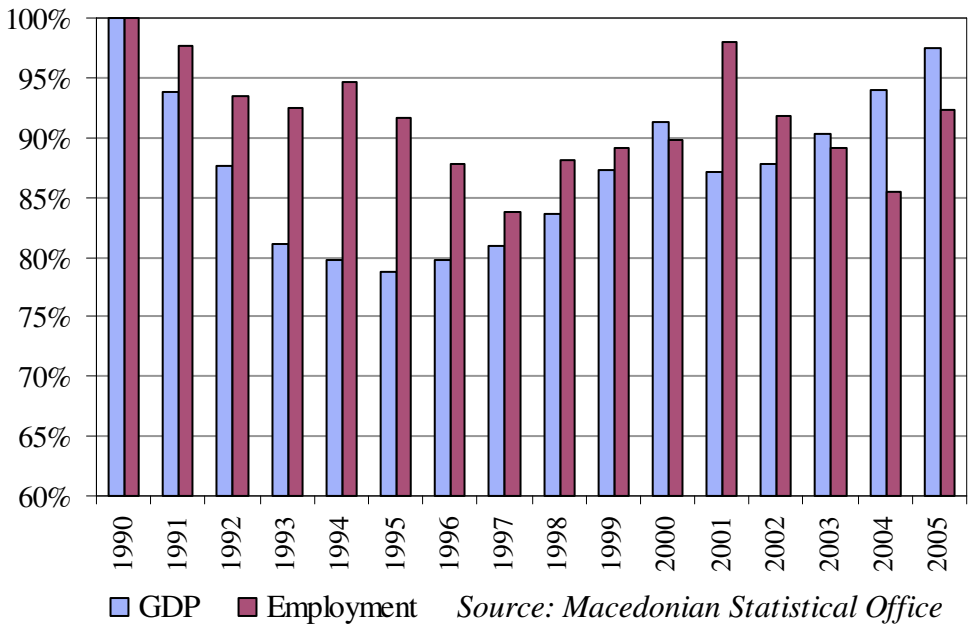
[4] The regional unemployment rates in former Yugoslavia were ranging from 10 to 20 percent, though they were based on data from state employment offices which do not comply with the ILO standards.
[5] Again, this unemployment rate is based on data from the state employment office.

South-East European region have contributed to the worsening macroeconomic ambience and impeded further development.

1.3.2 Macroeconomic trends and the role of macroeconomic policies

The evolution of Macedonian real GDP corresponds to the stylised facts described in section 1.2 demonstrating a U-shaped pattern. The lowest level of GDP during the first period of transition was attained in 1995 which represented about 79 percent of the 1990 level. Although comparable in its magnitude to that found in other CEECs and the Baltic states, the GDP slump in Macedonia occurred several years later, indicating the late start of reforms (Svejnar, 1999; Boeri and Terrell, 2002). The transformational recession was followed by a period of gradual recovery in GDP (1996-2000) which was interrupted in 2001 due to political instability at that time (Figure 1.1). Despite its return to growth typical of the second phase of transition, Macedonia is still lagging behind advanced transition countries since only in 2006 did its real GDP finally attain its pre-transitional level.

Figure 1.1 Relal GDP and employment growth in Macedonia (1990=100%)



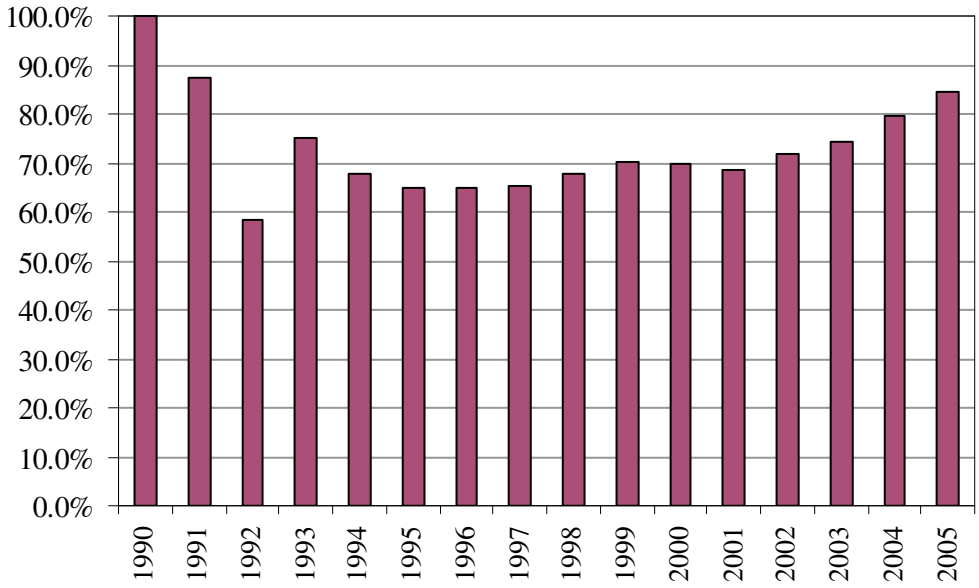
Source: Macedonian Statistical Office

The trend in aggregate employment during the first phase of transition exhibited a less rapid decline than that for real output. In contrast, the second phase of transition is characterised by a stabilisation of employment despite the increasing

output. This pattern has been particularly emphasised after the 2001 recession when the gap between the GDP growth and employment growth widened in favour of the former. Growing GDP coupled with stagnant employment reflects the so-called 'jobless' growth of Macedonian economy and increasing productivity, which was somewhat expected having in mind the prevalence of the private sector since mid 90's. However, as argued by Falcetti et al. (2006), and as we will see in Chapter 4, this rising productivity might be misleading since the official employment figures do not fully include employment in the informal sector.

In order to provide a more complete overview of the labour market adjustment we also need to take into consideration the trend in real wages. Empirical evidence shows that alongside the GDP and employment decline, at the outset of transition almost all transition countries experienced substantial real wage decreases (Mickiewicz and Bell, 2000; Boeri and Terrell, 2002). The wage decrease was much deeper in CIS countries than in CEECs and Baltics and accompanied by rising inequality in the wage distribution (Newell, 2001). Even though, the wages adjusted to initial transitional shock, it has been found that wage adjustment was not enough to equilibrate employment, which caused high unemployment rates to persist (Bornhorst and Commander, 2006). As presented in Figure 1.2 the net real wages in Macedonia also sharply declined. In 1992 the index of real wages fell to 58.4 percent of the 1990 level. This period was followed by a period of stabilisation (1993-2001) when the index of real wages was varying around 70 percent of the 1990 level. After the 2001 recession the index of real wages started to grow, but currently it is still below the pre-transitional level.

Figure 1.2 Index of real wages in Macedonia (1990=100%)



Source: Macedonian Statistical Office

Having in mind the trends in employment and real wages, we can discern different patterns of labour market adjustment in the two sub-periods of transition. In the first phase, labour market adjustment was conducted both through wage reductions and lay-offs of the 'surplus' labour force. In the second phase of transition we can categorise the Macedonian labour market as being stagnant, though employment continued to decline productivity was now increasing. This conclusion particularly holds for the period after the 2001 recession, since when employment and real GDP growth have quite opposite trends.

In completing the context of macroeconomic performance it is also important to note the high rates of inflation experienced at beginning of transition due to the process of price liberalisation (Svejnar, 2002a). In the case of Macedonia as in number other transition countries this process turned into hyperinflation reaching 1,246 and 608.4 percent in 1989 and 1990 respectively. As a result of introduction of restrictive monetary policy thereafter, inflation gradually decreased during the initial period of transition and it was finally curbed by 1995 when it was reduced to 15.9 percent. Since 1996 inflation in Macedonia has remained at the one-digit level, demonstrating a relatively stable monetary surrounding.

During the whole period of transition the inflow of foreign direct investments (FDI), as in other transition countries across the South-East European region, remains relatively low when compared to more advanced transition countries, which indicates

that this region is still considered to be politically unstable (Minassian, 2002; World Bank, 2003; Micevska, 2004). An overview of the broad macroeconomic trends in Macedonia is presented in Table 1.1.

Table 1.1 General macroeconomic and labour market indicators for Macedonia (1990-2005)

Year	GDP in 1995 denars (in milion denars)	GDP real growth rate	General budget balance (% of GDP)	Inflation Rate	Foreign Direct Investments (% of GDP)	Labour force participation rate	Employment rate	Unemployment rate
1990	215111	-	-	608.4	-	52.7	40.6	23.0
1991	201837	-6.2	-	-	-	51.8	39.1	24.5
1992	188586	-6.6	-	-	-	50.2	37.0	26.2
1993	174500	-7.5	-13.2	-	-	47.9	34.7	27.7
1994	171432	-1.8	-2.7	122.0	0.7	46.7	36.2	30.0
1995	169521	-1.1	-1.0	15.9	0.2	45.4	-	35.6
1996	171530	1.2	-0.5	3.0	0.3	54.9	37.4	31.9
1997	174000	1.4	-0.4	4.4	0.8	53.7	34.4	36.0
1998	179879	3.4	-1.7	0.8	3.6	54.8	35.9	34.5
1999	187684	4.3	0.0	-1.1	0.9	53.1	35.9	32.4
2000	196222	4.5	1.8	5.8	4.9	52.9	35.8	32.2
2001	187342	-4.5	-7.2	5.5	12.8	55.5	38.6	30.5
2002	188941	0.9	-5.7	1.8	2.1	52.6	35.8	31.9
2003	194263	2.8	-0.6	1.2	2.0	54.5	34.5	36.7
2004	202189	4.1	0.4	-0.4	2.8	52.2	32.8	37.2
2005	209872	3.8	0.3	0.4	2.5	55.3	35.1	36.5

Sources: Macedonian Statistical Office, Ministry of Finance and National Bank

The policy mix followed by the successive Macedonian governments during the whole period of transition has been characterised by highly restrictive monetary and fiscal policy. The tightness of the monetary policy can be viewed first, in the low level of money supply growth and second, in the high real interest rate relative to the euro zone both of which restrain the development of the real sector (Gligorov and Mojsovska, 2005). On the other side, from Table 1.1 we notice that Macedonia has conducted prudent fiscal policy since on average, the general budget deficit during the considered time period was below 2 percent of the GDP and largely unaffected by the political business cycle. This policy mix has contributed to the slow development of the Macedonian economy which is eventually translated into a low rate of job creation and persistent unemployment.

1.3.3 The impact of privatisation on the labour market outcomes

The process of privatisation in Macedonia was divided into two phases. The first phase started by the end of 1989 when the last federal government in former Yugoslavia implemented the Law on Social Capital and lasted until the proclamation of Macedonian independence in 1991. According to this Law firms were privatised by issuing so-called 'internal shares' that employees could purchase usually at a substantial discount to their market value. During this period it is estimated that 240 out of 1,500 Macedonian enterprises were privatised under the aforementioned law (Kljusev et al., 2002).

The second phase of privatisation started in June, 1993 when the previous federal law was replaced by the Law on the Transformation of Social Capital. According to this Law the method of privatisation was based upon the sale of enterprises on a case-by-case basis to be managed by the Privatisation Agency. Management teams from within enterprises were allowed to use their internal shares obtained in previous privatisation as a down payment. This concession given to insiders effectively blocked any outside party interested in offering an alternative development plan for a specific enterprise undergoing privatisation. Even in the cases where shares were available to both insiders and outsiders, insiders tended to purchase the majority as they had more information on the company and could benefit from discounts (Petkovski and Bishev, 2004).

The domination of the employees and management buyout model of privatisation in Macedonia meant a very low level of outsider, and particularly foreign, involvement which is consistent with the low level of FDI observed in Table 1.1. Furthermore, the insider dominated ownership had adverse implications for the corporate governance and restructuring in terms of an emphasis upon job preservation to the neglect of deep restructuring and future job creation (Gligorov and Mojsovska, 2005). As a consequence, we expect that the privatisation process dominated by insiders, alongside the restrictive macroeconomic policies discussed above, may have had a pervasive impact on the labour market by inducing a stagnant pool of unemployment and the prevalence of the long-term unemployment.

1.4 Labour market trends in Macedonia during transition

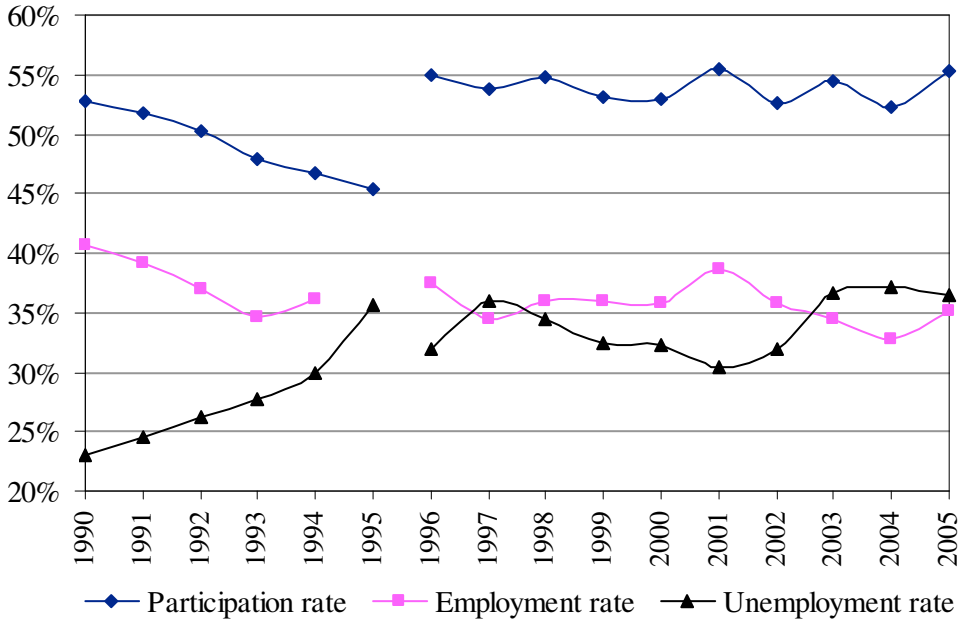
After presenting the general macroeconomic environment during transition we can turn to an analysis of the Macedonian labour market characteristics. In order to investigate the features of the Macedonian labour market during transition, it is appropriate to divide the transitional period into two sub-periods. The first period encompasses the transformational recession from 1990 to 1995, with the second period starting immediately thereafter and lasting until the present. This distinction is necessary for two reasons: first, as we have seen in the previous section there is a difference in the development of transitional processes between the first phase of initial shock and subsequent phase of stabilisation. The second reason is more technical and concerns availability of data. Namely, the first Labour Force Survey (LFS) in Macedonia was conducted in 1996, and since then we have detailed data concerning labour market trends.

The LFS is one of the most valuable sources of information regarding trends in the labour market. This survey is conducted according the methodology recommended by the International Labour Office (ILO) ratified at the 13th International Conference of Labour Statistician in October, 1982 (ILO, 1990) and the recommendations of the European Statistical Bureau (Eurostat). The goal of the LFS is to provide comparable data concerning the size and the structure of the active population according to international standards. Units under observation in the LFS are the households and all the persons in them. A person is classified as unemployed if during the reference period of the survey he/she is without work, currently available for work, and seeking work.

However, there are also some limitations related to the LFS methodology that any researcher should take into account when using this source of data. First, LFS criteria do not pay attention to the institutional or legal provisions such as unemployment benefits or the registration with employment state offices. Second, LFS categories refer only to a person's particular activities during a specific reference period. Third, due to a small sample size in some cases LFS data are unable to accurately capture specific information on structural and regional issues (European Commission, 1999). Finally, in less developed transition countries, such as Macedonia, the lack of experience and the required skills, initially caused sampling and statistical problems concerning the reliability of LFS data.

In the period 1996-2003, the Macedonian LFS was conducted on a yearly basis. The survey period lasted one week usually in April, while the reporting period was the week prior to the week when the survey was conducted. During this period, the survey was conducted in a sample of 7,200 households across the whole territory of the country, which represented 1.5 percent of the total number of households in the country. Since 2004 LFS is conducted as a continuous survey throughout the year with quarterly processing of data. At the same time, the sample size has increased to 10,000 households which is 1.8 percent of the total number of households in the country. For the period prior to 1996 we can explore labour market trends based on the number of registered unemployed workers. Because of data incompatibility between the two periods we undertake separate analyses as presented in Figure 1.3.

Figure 1.3 General trends in the Macedonian labour market



Source: Macedonian Statistical Office

From Figure 1.3 we observe that during the initial phase of transition, the labour force participation and employment rates fell for most of this period, while the unemployment rate steadily increased.[6] These trends are in line with the normal labour market patterns found in the CEECs: declining employment under the initial shock of recession and subsequent persistence of sluggish demand for labour. The second period of transition is characterised by broad stability in all three rates. However, we can observe a second recession starting from 2001, primarily caused by

[6] The numerical values are presented in Appendix 1.1.

the already mentioned political instability. The downward trend in the unemployment rate was broken and unexpectedly remained high for several years. Only recently, are there some positive signs of a slow recovery and the possibility of renewed decreases in unemployment. In what follows in this section, we focus on the characteristics of the Macedonian labour market in the light of the general trends during transition which aims to determine to what extent the characteristics of the Macedonian labour market resemble those typical of the rest of transitional world.

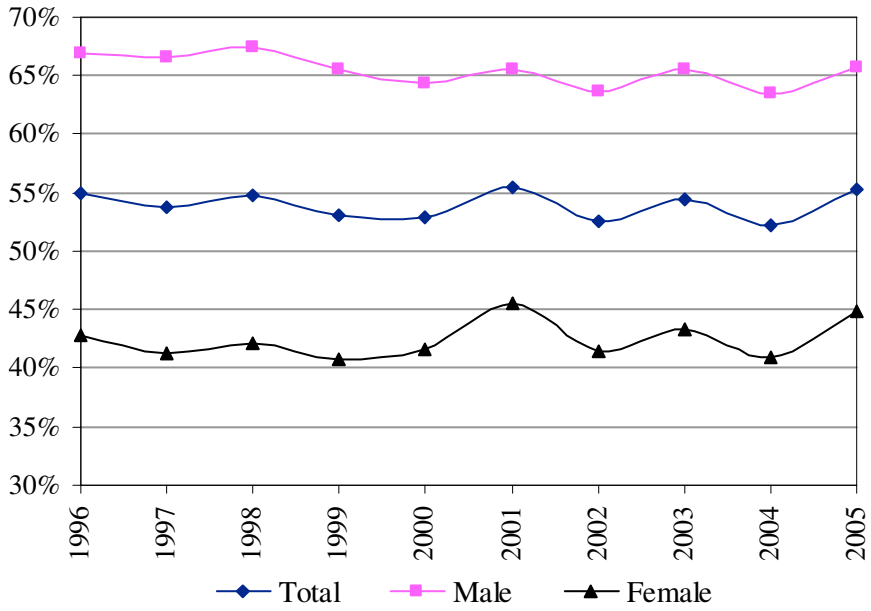
1.4.1 Labour force structure and participation

Generally, labour force participation rates in the former socialist countries were initially significantly higher than those in the OECD countries. Labour force participation was encouraged by generous economic incentives such as: providing health insurance, childcare subsidies, and various types of social insurance for labour force participants (Boeri and Terrell, 2002). One of the most striking characteristics of transitional labour markets is the trend of decreasing participation (Cazes and Nesporova, 2003). Although, Macedonia was an exception in that it had relatively low participation before the start of transition, its labour force participation rate fell between 1990 and 1995 from 52.7 percent to 45.4 percent. Furthermore, during the second period of transition it stabilised and, in 2005, based on the data taken from LFS it was estimated to be 55.3 percent. In this context, the phenomenon of non-participation as a labour market adjustment mechanism will be detailed in Chapter 5. At this point, we next analyse the labour force structure with regard to several characteristics: gender, age, education and ethnic background.

First, considering the gender differences, it is evident that male labour force participation rate is higher than female participation rate (Figure 1.4). The male participation rate varies between 66.9 percent in 1996 and, 65.8 percent in 2005, while female participation rate varies between 42.9 percent in 1996 and, 44.8 percent in 2005. The observed gender difference in participation rates is consistent with the findings from other transition countries where relatively lower female participation is attributed to restrictions on maternity benefits and child care facilities, which particularly influenced women to leave the labour force in order to take care of their children (Cazes and Nesporova, 2003). Nevertheless, we can claim that these factors

in Macedonia are of lesser importance since the gap in gender participation rates was relatively large even in the pre-transitional period.

Figure 1.4 Participation rates in Macedonia



Source: Macedonian Statistical Office, LFS 1996-2005

Second, considering age, one of the apparent trends is the steady decrease in the participation rate of youths (age between 15 and 24). For instance, the participation rate of this group in 1996 was 53 percent, while in 2005 it had fallen to 34.5 percent. One explanation for this trend is the longer duration of full-time education of young people. For instance, the number of students in post-compulsory education of university level has doubled from around 25000 in 1990 to over 50000 in 2005. The extension of education beyond the compulsory primary education might be attributed to several factors such as: (i) trend of increasing employment requirements by employers, (ii) reduction in eligibility of young people for unemployment benefits, or simply (iii) because of the poor employment prospects, which discourage young school-leavers from entering the labour force. Thus, the postponement of decision to enter the labour force can be considered as another form of labour market adjustment mechanism (Blanchard, 2006). On the other side of age distribution, it is evident an increase in the participation rate of workers close to retirement (age between 50 and 64). The participation rate of this group of workers in 1996 was 45.4 percent, while in 2005 it had risen to 51.7 percent. This can be explained by the reduction in the generosity of early retirement schemes for older

workers, which were a characteristic of the first phase of transition. The participation rate of prime age workers (aged between 24 and 49) during the period 1996-2005 remained stable and relatively high compared to other groups, ranging between 77 percent and 78.6 percent.

Third, the cross-section analysis of the labour force educational structure from the 2005 LFS shows that 15.3 percent have completed some higher education[7], 25.5 percent have only primary education while the majority of the labour force (51.8 percent) have completed secondary education.[8] According to the human capital theory, educational attainment alongside with the workers' experience is considered to be a crucial determinant of the labour supply. In the previous socialist period emphasis had been given to vocational secondary education (Boeri and Terrell, 2002). In contrast, during transition general secondary and higher education have become more valuable because they increase the worker's employment prospects with respect to structural changes in the pattern of employment. Additionally, as mentioned above employers' requirements for newly created jobs have became more demanding regarding the key competences possessed by workers (Boeri, 2000; Mojsoska, 2006).

Finally, we consider the composition of the labour force with respect to the ethnic background. According to the results from the census in 2002, the population in Macedonia consists of 64.18 percent Macedonians; 25.17 percent Albanians; 3.85 percent Turks; 2.66 percent Roma; 1.78 percent Serbs; 0.48 percent Vlaha; and 1.88 percent citizens with other ethnic backgrounds. On the other hand, the ethnic labour force structure estimated from the LFS in 2000[9] is as follows: 78.8 percent Macedonians; 13.1 percent Albanians; 2.5 percent Turks; 1.6 percent Roma; 1.4 percent Serbs; 0.3 percent Vlaha; and 2.3 percent workers with other ethnic background. Compared with the population structure in the country, we can conclude that labour force structure is biased towards a greater participation of Macedonians, whereas workers with other ethnic backgrounds such as Albanians, Turks and Roma are underrepresented. These differences might be attributed to factors such as: different female participation rates due to religious and cultural legacies, different demographic structures or discrimination.

[7] Higher education includes all types of university level education.
[8] Secondary education includes both 3 and 4 years secondary education.
[9] The ethnic structure of Macedonian labour force is not published in the LFS publications 2001-2005.

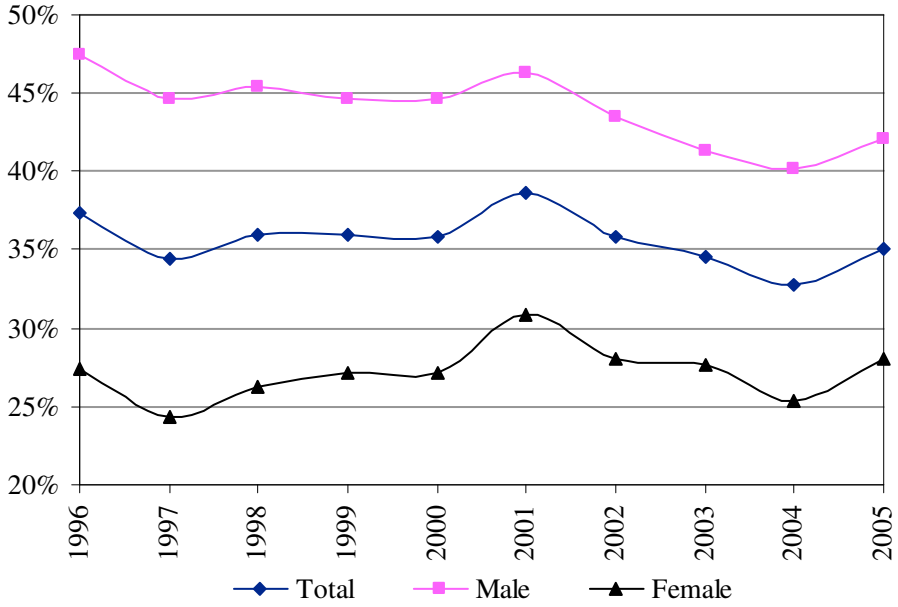
1.4.2 Employment

As in most of transition countries, alongside the decline of labour force participation rate during the first phase of transition, the employment rate in Macedonia experienced a rapid fall. In the second phase of transition, the employment rate stabilised, varying between 34.4 percent in 1997 and 38.6 percent in 2001. During the second recession after 2001 the employment rate decreased though with a recent upturn suggesting a modest recovery. We next present our findings on the structure of employment in Macedonia along several dimensions: gender, education, ethnic background, sectoral allocation and employment status.

First, as depicted in Figure 1.5 employment rates show similar gender differences as labour force participation rates. For the whole period 1996-2005 the male employment rate is higher than that of females and there is no clear tendency for this gap to narrow. However, the male employment rate has slightly fallen, varying between 47.5 percent in 1996 and, 42.1 percent in 2005, while the female employment rate has slightly risen varying between 27.4 percent in 1996 and, 28.1 percent in 2005.

Second, for the whole period of 1996-2005 workers with university level of education have experienced the highest employment rate, followed by those with secondary education and finally, by those with only primary education. These findings are in accord with underlying theoretical background as well as with the empirical evidence in other transition countries, where despite the initial recession workers with higher education enjoyed better economic prospects relative to those with lower levels of education (Cazes and Nesporova, 2003).

Figure 1.5 Employment rates in Macedonia

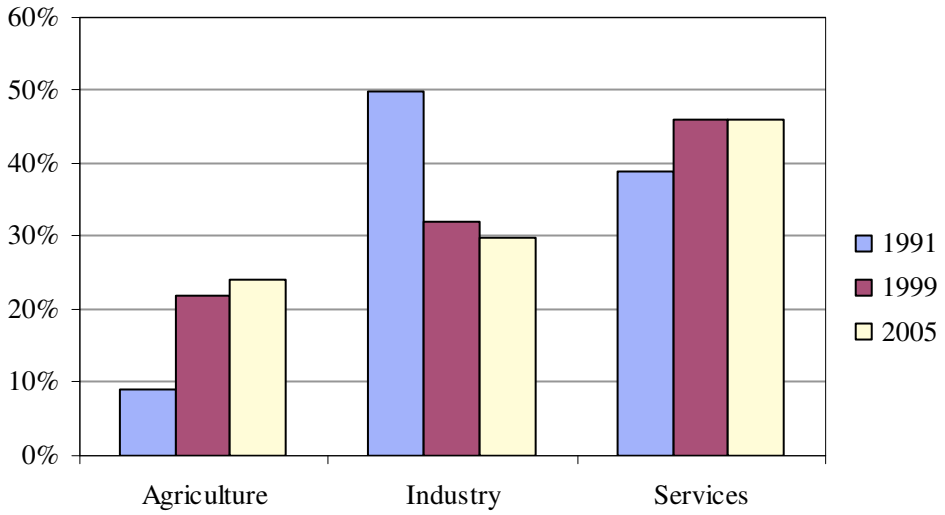


Source: Macedonian Statistical Office, LFS 1996-2005

Third, the ethnic composition of employed population is biased towards a greater share of workers with Macedonian ethnic background. According to the LFS in 2000, the employed population consists of 83.5 percent Macedonians, 9.8 percent Albanians, 2.3 percent Turks, 0.7 percent Roma, 1.3 percent Serbs, 0.3 percent Vlaha and 2.1 percent workers with other ethnic background. These differences are similar to those found for labour force participation and may again be attributable to the factors discussed above.

Fourth, the changes in the percentage shares of employment by sectors reveal that in Macedonia, as in other transition countries, there have occurred significant sectoral shifts. The changes in percentage shares of employment in each of three sectors (agriculture, industry and services) for the period 1991-2005 are presented in Figure 1.6. We can notice a modest increase in the share of employment in services from 39 percent in 1991 to 46 percent in 1999, which thereafter remained stable until 2005. During this period the share of employment in industry decreased from 50 percent in 1991 to just 32 percent in 1999 and only 30 percent in 2005. However, the most significant increase has been marked in the share of employment in agriculture from 9 percent in 1991 to 22 percent in 1999 and up to 24 percent in 2005.

Figure 1.6 Structure of employment by sectors in Macedonia



Source: World Development Indicators database and Macedonian Statistical Office

These trends in employment by sectors indicate that in Macedonia new jobs are not predominantly created in the more productive industries and service sector, but rather in agriculture and low productivity services. The increase in the share of employment in agriculture suggests that this sector has become a buffer for some people who have lost their jobs in the state-owned industrial enterprises (Micevska, 2004; Rutkowski, 2006). Having in mind that in 2005 agricultural share in GDP accounted for about 11.5 percent, whereas the share of employment in this sector represented 24 percent of total employment, we can conclude that the agricultural sector is characterised by low productivity relative to the other two sectors. Moreover, subsistence farming together with other non-standard forms of employment may significantly influence employment rates depending on whether they are included or not in the official LFS estimations (Brown et al., 2006).

Fifth, concerning employment status, one can observe a reduction in the share of employees and an increase in the share of employers, self-employed and unpaid family workers. The general trends of employment by employment status for the period 1996-2005 is presented in Table 1.1.

Table 1.2 Structure of employment by employment status in Macedonia (percents of total employment)

Year	Employee	Employer	Self-employed	Unpaid family workers
1996	78.9	2.9	11.2	7.0
1997	78.5	3.3	13.0	4.9
1998	77.4	3.5	10.7	8.3
1999	74.5	8.0	7.3	10.3
2000	74.3	4.3	10.5	10.9
2001	70.1	6.4	9.2	14.4
2002	70.7	6.8	10.3	12.2
2003	72.7	7.6	8.2	11.4
2004	75.4	5.9	10.2	8.5
2005	67.6	5.7	13.3	13.4

Source: Macedonian Statistical Office, LFS 1996-2005

As we can see from Table 1.1, the percentage share of employees as a part of the total employment in 1996 was 78.9 percent while, in 2005 it had fallen to 67.6 percent. The percentage shares of employers and unpaid family workers almost doubled during the same period, whereas the share of the self-employed remained fairly stable. These trends in the employment structure are in line with the general tendencies found in other transitional labour markets, but also reflect some peculiarities of SEECs. First, there is an obvious change in ownership structure, reflecting the emergence of a private sector where small businesses represent the predominant part. For instance, the percentage share of workers in private firms in 2005 was 64.4 percent of total employment, while in 1996 the percentage share of employment in the private firms accounted for just 33.5 percent of total employment. However, it is worth mentioning, as we will show in Chapter 3 that its growth has not compensated for the job losses in the state sector. The second trend observed in Macedonian labour market as indicated by the increased representation of the unpaid family workers is the rising share of non-standard types of employment, which is characteristic for those transition countries where subsistence agriculture has significant dimension (Brown et al., 2006). Consequently, the growth of the private sector is important as a stabiliser of the economy, but in the case of Macedonia, it has not been able to fully absorb all of the newly unemployed released by the declining state sector.

Finally, we observe high employment in the informal sector which arises as a consequence of poor prospects for employment in the Macedonian formal labour market. The percentage share of informal sector in total employment is estimated to

be among the highest in transition countries, reaching 36.3 percent (Schneider, 2005). Informal employment may take various forms including both performing undeclared economic activity as a main economic activity or having undeclared second jobs. A large informal economy explains the rising share of unpaid family workers, who are often attached to various non-standard forms of employment. The importance of the informal sector as a way of escaping poverty has become more pronounced after reduction of the welfare benefits for unemployed considered in section 1.5 below. However, more detailed analysis of the informal sector as a labour market adjustment mechanism will be presented in Chapter 4.

1.4.3 Unemployment

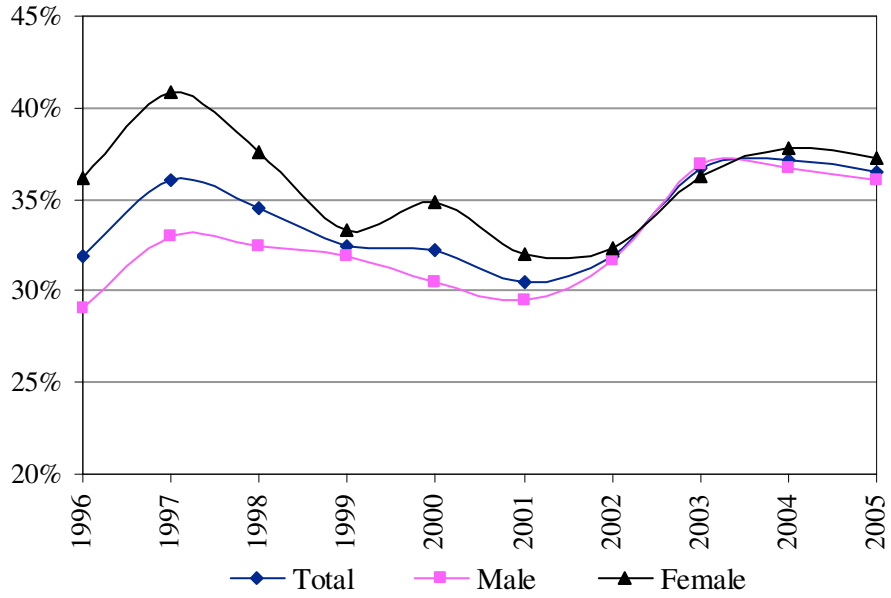
The unemployment rate in Macedonia is among the highest in transition countries. As in the rest of the transitional world, during the first phase of transition, the unemployment rate showed a marked increase from 23 percent in 1990 to 35.6 percent in 1995.[10] Based on the LFS data, the unemployment rate in 1996 was estimated to be 31.9 percent, followed by period of steady decline until 2001 and a sharp increase thereafter. The unemployment rate based on the registered number of unemployed for the second period is even higher than the unemployment rate estimated from LFS. For instance, registered unemployment in 2000 peaked at 44.9 percent of the total labour force, which to our knowledge represents the highest registered unemployment rate among all transition countries. The differences between the LFS and registered unemployment will be discussed later in section 1.7. We now disentangle the nature of unemployment in Macedonia by analysing the published LFS data for the period 1996-2005.

First, the structure of unemployed by gender shows that the female unemployment rate is higher than the male unemployment rate. From Figure 1.7 we can see that these unemployment rates have been converging constantly during the period 1996-2005. In 1996 the difference in unemployment rates was 7.1 percentage points, while in 2005 it has been reduced to only 1.2 percentage points. Generally, in transition countries there is no unique trend of convergence of gender unemployment rates. This trend of diminishing female unemployment rate up to 2001 compared to relatively stable male unemployment rate may reflect the changing structure of the

[10] These figures are based on registered number of unemployed.

Macedonian economy with trend of prevailing of those branches which employ mostly female labour force. The main evidence for this assertion comes from the growing agricultural sector, which absorbs a larger share of female workers than other sectors. Alternatively, the decreasing female relative to male unemployment rate may be attributed to raising non-participation among female workers, a possibility that we examine later in Chapter 5.

Figure 1.7 Unemployment rates in Macedonia



Source: Macedonian Statistical Office, LFS 1996-2005

Second, considering the level of education in 2005 workers who had only completed primary education faced the highest unemployment rate (43.1 percent) followed by workers with secondary education (38.6 percent) and finally, the lowest unemployment rate was experienced by workers with university level of education (22.8 percent). Like other transition countries, we can conclude that in Macedonia the unemployed are mostly people with a lower level of education. However, the unemployment rate of workers with tertiary education in Macedonia is still extremely high compared to other CEECs, where the average unemployment rate for this group of workers is 4 percent (Rutkowski, 2006).

Third, regarding the age distribution of the unemployed, in 2005 the highest unemployment rate is observed among young workers (aged between 15 and 24), which was 59.9 percent, followed by the unemployment rate of prime age workers (aged between 25 and 49) at 35.6 percent and finally, the unemployment rate of

workers close to retirement (aged between 50 and 64) which was 26.8 percent. High youth unemployment is a characteristic of almost all transition countries (Blanchflower, 2001; Cazes and Nesporova, 2003; Rutkowski, 2006). This is partly explained by supply factors such as lack of appropriate education or/and experience among the young workers and partly by demand factors such as insufficient job creation. In addition, according to Rutkowski (2006), the high fraction of young labour market entrants among the unemployed in Macedonia can be partly attributed to the legacies of the old system such as the high degree of job protection granted to incumbent workers.

Fourth, concerning the ethnic structure of unemployed population in Macedonia there are no disadvantaged ethnic groups *i.e.* all ethnicities face similar probabilities of becoming unemployed. According to the LFS in 2000, the unemployed population consists of 68.8 percent Macedonians, 19.9 percent Albanians, 3 percent Turks, 3.7 percent Roma, 1.6 percent Serbs, 0.3 percent Vlaha and 2.6 percent workers with other ethnic background. Therefore, we can conclude that the ethnic composition of the unemployed population bears a close comparison with the ethnic composition of the population.

Fifth, the Macedonian labour market is characterised by a relatively stagnant unemployment pool that has been translated into increasing long-term unemployment.[11] For instance, long-term unemployment accounted for 80.7 percent of total unemployment in 1996 and it grew steadily until 2005 when it accounted for 86.7 percent of total unemployment (Table 1.3). Moreover, the so-called very-long-term unemployment comprising the unemployed who look for jobs for more then four years is outstandingly high (OECD, 2002a). For instance, in 2005 the proportion of very-long-term unemployed accounted for 65.4 percent of total number of Macedonian unemployed population. Concerning gender characteristics of unemployment duration there is no significant difference in unemployment duration between the male and female unemployed population, thus we do not present them separately.

[11] Long-term unemployment includes all unemployed workers that look for work for more than one year.

Table 1.3 Duration of unemployment in Macedonia (percent of the total unempl.)

Year	up to 1 month	2-5 months	6-11 months	12-17 months	18-23 months	2 years	3 years	4 years and more
1996	3.2	5.2	10.9	7.9	8.2	11.7	8.4	44.5
1997	2.4	5.4	9.1	7.3	8.6	14.1	9.6	43.6
1998	1.8	6.0	9.3	5.9	7.9	1.5	12.2	55.4
1999	4.4	4.2	7.6	5.2	7.5	0.9	10.9	59.3
2000	4.8	4.7	7.2	4.6	7.8	1.2	9.3	60.4
2001	3.4	4.4	5.3	5.9	5.3	0.9	10.0	64.8
2002	2.3	5.8	7.4	4.1	5.9	1.2	10.5	62.8
2003	3.0	5.3	6.6	5.8	3.4	0.7	11.7	63.6
2004	1.7	6.0	6.9	6.6	4.7	0.8	9.0	64.3
2005	2.0	5.1	6.1	6.0	4.9	0.9	9.5	65.4

Source: Macedonian Statistical Office, LFS 1996-2005

Long-term unemployment has significantly contributed to an erosion of skills and motivation of unemployed workers, making them less employable over time (Gregg and Manning, 1996). The deterioration of skills further reduces the attractiveness of the labour force and contributes to a blurring of the difference between the states of unemployment and non-participation. After remaining unemployed for a long period of time, a considerable part of unemployed workers stops looking for jobs and quits the labour force. This is known as the phenomenon of 'discouraged workers,' a characteristic for depressed labour markets where labour demand is insufficient and unemployed workers face poor employment prospects. Discouraged workers do not fulfil the requirements of job search as a precondition to be counted as unemployed. On the other hand, they can easily re-enter the labour force if, conditions on the demand side of the labour market improve. The empirical literature has recently documented the problems that statistical offices in transition countries encounter in estimating the unemployment rates in the presence of large numbers of discouraged workers (OECD, 2002a; Brown et al., 2006; Kingdon and Knight, 2006). How to categorise those that lie on the borderlines between unemployment on the one hand side, and employment or inactivity on the other side, may significantly influence the officially calculated unemployment rate. We consider this issue in our later chapters that examine labour market adjustment mechanisms in SEECs.

Although we are unable to undertake a separate analysis, we also acknowledge the existence of underemployment. The term underemployment is used to designate the state of those workers who are able to find employment only for short

periods of time, such as involuntary part-time workers, seasonal workers, day or casual workers, whose relative shares in the total workforce typically increased during transition (Brown et al., 2006). In Macedonia this is the situation not only for many legally employed workers, but also for those who work in the informal sector (Chapter 4). The category underemployed also includes workers whose level of education and professional skills make them overqualified for their jobs. This is the case of the workers with a strong educational background forced to perform various types of 'unfavourable' jobs in order to secure their basic existence (Svejnar, 2002a). Therefore, two basic forms of underemployment are persistent: visible underemployment, which is characterised by insufficient working hours and, invisible underemployment, associated with productivity losses due to insufficient use of human capital.

Having in mind the above-mentioned characteristics, we can conclude that the labour market in Macedonia is affected by striking segmentation, meaning that certain social groups such as: youths, less educated workers, and women, face a much higher risk of unemployment and/or non-participation than the rest of the labour force. This conclusion is in accord with the findings for some other transition countries (Blanchflower, 2001; Rutkowski, 2006). The high Macedonian unemployment rate has enormous social implications such as rising poverty and income inequality. For example, the estimated percentage of the population living below the poverty line in 2003 was 21.7, whereas the Gini coefficient in the same period stood at 0.373 (World Bank, 2005a). Long spells of unemployment often leads to the degradation and dehumanisation of individuals in society, causing social exclusion and increasing the burden for the government of providing the necessary safety net. Consequently, the problem of unemployment is not only a personal problem for the people who experience it, but it has become a problem for the economy as a whole. Today, the Macedonian government bears a big part of the responsibility for the poor labour market performance that can be partly improved by undertaking appropriate policy measures. In this context, we next examine some aspects of passive labour market policy through analysis of unemployment benefit system.

1.5 Characteristics of unemployment benefit systems in transition countries

Unemployment benefits, largely known as unemployment compensation schemes, represent one of the most frequently used instruments of passive labour market policies. The purpose of unemployment compensation schemes is to provide a minimum safety net for the unemployed while searching for new employment. Within the unemployment compensation schemes we should differentiate between unemployment assistance and unemployment insurance. While unemployment assistance is a scheme for redistribution of income among individuals, unemployment insurance represents a scheme for transfer of workers' earnings through time (Spiezia, 2000).

Transition countries have introduced a similar set of labour market institutions to those found in the OECD (Riboud et al., 2002). This introduction was considered as a 'natural experiment', since most transition countries had to build a system of labour market institutions from scratch (Boeri, 1997). However, just as labour market institutions in OECD countries demonstrate an enormous diversity, variation also holds for transition countries. Two different periods can be distinguished in the design of unemployment benefit systems in transition countries. During the first stage of transition, when open unemployment was still negligible, almost all transition countries introduced relatively generous compensation systems for unemployed. Although largely understaffed, public employment offices were also established to cope with massive inflows of unemployed workers. According to Boeri (2000), social policies toward the unemployed at the outset of transition were associated with a number of mistaken steps such as allowing school leavers to claim unemployment benefits, the introduction of an open-ended benefit system in Poland and allowing the unemployed to shift from one benefit to another. Subsequently, as unemployment rates in the majority of transition countries rose above 10 percent, the burdensome fiscal pressures induced many of the governments to reduce the generosity of unemployment benefits (Vodopivec, 2000; Casez, 2002; Chetvernina, 2003; UNECE, 2003). Since the design of an appropriate unemployment compensation scheme represents significant challenge for transitional governments, in what follows in this section, we outline the main features of the 'natural experiment' by assessing the changes in eligibility criteria, replacement rates, duration, coverage and financing. A

summary of changes in benefit design in selected transition countries is presented in Table 1.3.

Table 1.4 Characteristics of the unemployment benefit systems in selected transition countries

Country	LFS unemployment rate (2002)	Registered unemployment rate (2002)	Eligibility criteria (required minimum employment record in months)		Replacement rate (average benefit as percentage of average wage)		Duration of unemployment benefit (months)		Coverage (share of unemployed receiving benefits)	
			Early transition	Late transition	Early transition	Late transition	Early transition	Late transition	Early transition	Late transition
Croatia	14.8	22.3	9	9	-	16.6	-	2.5-10	-	21.6
Bulgaria	17.6	16.3	6	9	60	33.1	6	4-12	24.8	20.2
Czech Rep.	7.3	9.8	12	12	60	22.0	12	6	48.8	33.8
Hungary	5.8	8.1	18	3	65	25.5	24	9	73.9	33.5
Poland	19.9	18.1	None	12	40	21.4	None	6-18	23.1	19.0
Slovakia	18.5	17.8	12	24	60	25.5	12	6-9	27.0	17.1
Romania	8.4	8.1	6	6	-	22.6	9	9	-	23.3
Slovenia	5.9	11.3	9-12	9-12	63	38.9	24	3-24	32.6	24.3
Estonia	10.3	5.9	6	12	10	6.8	6	6-12	59.3	49.6
Russia	8.9	1.7	3	6	75	20.7	12-24	12	89.5	89.0

Source: International Social Security Association (www.issa.int)

1.5.1 Eligibility criteria

The eligibility criteria for unemployment benefits vary considerably across transition countries. A person who is registered as unemployed is entitled to unemployment benefit if he/she has had unemployment insurance coverage during the minimum required period. The most generous eligibility criteria in the early phase of transition were found in Poland, where no previous employment record was required. However, in the later phase the leading position in generosity of eligibility criteria was taken by Hungary, where minimum required period of previous employment was set up to 200 days during the last 4 years. In other transition countries, eligibility requirements for unemployment benefits vary in the range between 6 and 12 months of previous employment within the period of 1 to 3 years (Table 1.3).

1.5.2 Replacement rates[12]

The replacement rate is the share of income in work, which is replaced by unemployment benefit. It can be measured by the average benefits as a percentage of gross average wage, or by the initial benefits level as a percentage of the previous earned wage. In most CEECs replacement rates expressed by the average unemployment benefit as percentage of the average wage varied between 40 and 60 percent in the earlier phase of transition. The replacement rates were even more generous in CIS countries ranging from 70 to 75 percent. In practice, there is an upper ceiling to the level of benefit, which varies from one country to another. Estonia was an extreme case with a lowest level of replacement ratio of only 10 percent. The generosity of unemployment benefits in all transition countries has been subsequently tightened and currently replacement rates range between 6.8 percent in Estonia to 38.9 percent in Slovenia (Table 1.3).

1.5.3 Duration of unemployment benefits

There are two different types of unemployment insurance schemes: those with fixed duration of benefits and those with duration depending on a number of different factors. Fixed duration of benefits is characteristic of the CIS countries, where duration is normally fixed up to 6 months. In many CEECs the duration of unemployment benefits is not uniform and depends on the period during which contributions were made to the unemployment fund and vary from 6 to 12 months. With the exception of Bulgaria and Estonia almost all transition countries have shortened the duration of unemployment benefits as transition entered its more mature phase (Cazes, 2002). For instance, the maximum duration of unemployment benefits in the Czech Republic was reduced from 12 to 6 months, in Hungary from two years to 9 months and in Poland, an open-ended unemployment benefit scheme was replaced by average duration of 12 months (Table 1.3).

1.5.4 Coverage of unemployment benefits

The coverage of unemployment benefit programmes expressed as a number of beneficiaries relative to the total number of unemployed has exhibited a continuous

[12] The replacement rate is also known as 'benefit replacement ratio'.

decline over the whole period of transition. Depending on their coverage of unemployment benefits, two groups of transition countries can be generally distinguished. In the first group are those with relatively high coverage of the unemployed (Hungary, Estonia and Russia) ranging from 35-90 percent. In the second group of transition countries, the coverage is estimated around 20 percent with extremely low rates in Albania and Lithuania at 7.1 and 11.6 percent respectively (Table 1.3).

1.5.5 Financing unemployment compensation schemes

The relative importance of the sources of financing[13] of unemployment benefits varies from one transition country to another. In most of the CIS countries there are no contributions by employees, whereas in CEECs they vary from 0.14 percent of earnings in Slovenia to 1.9 percent of earnings in Latvia. The contribution of employers in CEECs varies from 1 to 6 percent of payroll tax, whereas in Russia it has been abolished. This means that the general taxpayer in Russian Federation covers the total cost of financing the unemployment compensation schemes. In most other transition countries government covers the deficit in financing the unemployment benefits (UNECE, 2003).

As in other transition countries, the SEECs have undertaken radical restrictions to their unemployment benefit systems in the later phase of transition. This has taken the form of strictly time-limited durations, low replacement rates and a low coverage of unemployment benefits. Having in mind that long-term unemployment prevails in most of SEECs, in the presence of limited benefit duration we can understand why unemployment compensation schemes cover only a very limited number of registered unemployed (Micevska, 2004).

The generosity of unemployment compensation programmes can be expressed by the generosity index, calculated as a product of the replacement rate and number of beneficiaries relative to the total number of unemployed (Vroman, 2002). Governments can use these two policy instruments in order to achieve the desired level of compensation for the unemployed given budget constraints. Thus, the same level of compensation for the unemployed can be obtained with a lower replacement

[13] There are three possible sources of financing of unemployment benefits: (i) contributions by employees, (ii) contributions by employers, and (iii) general taxpayers.

rate and higher coverage, or alternatively with a higher replacement rate and lower coverage. The generosity indices for selected transition countries in 2002 are presented in Table 1.4.

Table 1.5 Generosity indices in selected transition countries

Country	Replacement rate	Coverage	Generosity index
Russia	20.7	89.0	0.184
Slovenia	38.9	24.3	0.095
Hungary	25.5	33.5	0.085
Czech Republic	22.0	33.8	0.074
Bulgaria	33.1	20.2	0.067
Romania	22.6	23.3	0.053
Slovakia	25.5	17.1	0.044
Poland	21.4	19.0	0.041
Croatia	16.6	21.6	0.036
Estonia	6.8	49.6	0.034

Source: Author's calculations based on Vodopivec et al. 2003

These estimations of generosity indexes for transition countries after the tightening of unemployment benefit schemes shows that they are now comparable with the levels of the least generous OECD countries such as Greece (0.032) and Portugal (0.091) (Vroman, 2002). An apparent exception is Russia whose relatively high level of the generosity index is a consequence of the higher coverage of unemployment benefits, rather than a high replacement rate. Despite the persistent unemployment rates and particularly high levels of registered unemployment, reductions in the generosity of unemployment benefit schemes in transition countries have resulted in increased incentives for employment. However, the lack of jobs means that these incentives were ineffective in raising employment. In favour of the above argument is the large empirical evidence confirming the absence of association between the tightening of unemployment benefit system and flows from unemployment to employment (Boeri, 1997; Ham et al., 1998; Boeri, 2000; Van Ours and Vodopivec, 2006). Moreover, we can expect that reductions in generosity have induced increased flows from unemployment into non-participation (or ultimately into informal employment) rather than into formal employment.

Another issue concerning the provision of unemployment benefits is the overall cost of the unemployment benefit schemes. Usually, the cost of unemployment benefit schemes is expressed as a percentage of GDP, or alternatively

as spending per unemployed person. Generally, the level of GDP spending on passive labour market policies depends on the two ingredients of the generosity index: the average replacement rate and the coverage of the unemployment benefit programmes. An illustration of spending for passive labour market policies in selected transition countries is presented in Table 1.5.

Table 1.6 Spending on labour market policies in selected transition countries (% of GDP)

Country	LFS unemployment rate	Registered unemployment rate	Spending on passive policies (percent of GDP)	Spending on passive policies (per unemployed)
Poland (1996)	12.3	13.2	1.71	0.12
Slovenia (1998)	7.7	14.5	0.89	0.11
Hungary (1997)	8.7	10.4	0.56	0.06
Macedonia (2002)	**31.9**	**39.9**	**1.86**	**0.05**
Slovakia (1996)	11.3	12.6	0.54	0.05
Czech Republic (1999)	8.7	9.4	0.31	0.04
Estonia (1998)	9.8	2.2	0.08	0.01
CEECs average	-	-	0.68	0.06
EU average	-	-	1.73	0.26
OECD average	-	-	1.43	0.23

Source: Vodopivec et al. (2003)

From Table 1.5, we notice that with the exception of Poland and Macedonia, transition countries devote lower shares of their GDP to unemployment compensation schemes compared to the EU and OECD average. However, the above exceptions emerge as a consequence of high unemployment rates in these countries, which imply low spending per unemployed person compared to the EU and OECD average. In conclusion, we can say that even though reforms consisting of tightening the unemployment benefits did not lead to an increase in formal employment, however they contributed to a significant reduction in budgetary spending.

1.6 The unemployment benefit system in Macedonia

The issues related to unemployment benefit system in Macedonia are regulated with the current Macedonian 'Law for Employment and Insurance in the Case of Unemployment', which dates from 1997. This law regulates several legal aspects of employment and insurance in the case of unemployment such as: administration of labour assistance, counselling for employers and workers,

registration of employers and unemployed persons, unemployment insurance, public works and so forth. According to this law, the administration of unemployment benefit scheme is assigned to the Employment Service Agency (ESA). As in other transition countries at the outset of transition, the unemployment benefits in Macedonia were generously provided for the majority of the unemployed. Subsequently, several modifications of the above-mentioned law have considerably reduced the generosity of unemployment benefit system.

Alongside unemployment benefits, there exists social assistance which is a means-tested benefit paid to those households with no formally employed adult members. A condition for the provision of this assistance is registration of the unemployed household members of working age with the ESA. As in most other transition countries, Macedonia adopted this type of income support scheme as the percentage of long-term unemployed increased in order to reduce unemployment-related poverty. According to the World Bank (2005a), this form of social protection transfer covered about 12 percent of the Macedonian population in 2003. Although important in alleviating the social consequences of unemployment, social assistance is not a subject of our further analysis. In what follows we present the main features of the current Macedonian unemployment benefit system in order to examine its possible deficiencies.

1.6.1 Eligibility criteria[14]

The registered unemployed can claim the following rights: (i) Unemployment benefit; (ii) Training; (iii) Health insurance; (iv) Pension and disability insurance; (v) Rights of disabled workers to employment under favourable conditions. A registered unemployed person can claim unemployment benefit if he/she has worked at least 9 months without interruptions or 12 months with interruptions during the previous 18 months. All registered unemployed are eligible for health insurance. To receive health insurance, the registered unemployed have to declare that they have no other way of being insured, e.g. through another family member.

[14] Eligibility criteria are regulated under article 64.

1.6.2 Replacement rate[15]

The maximum benefit is set at 50 percent of the previous average monthly wage calculated for the last 24 months for those unemployed who receive unemployment benefit up to 12 months and, 40 percent for those who receive more than 12 months.

1.6.3 Duration of unemployment benefits[16]

Duration of unemployment benefits is variable and depends on the duration of the previous unemployment insurance. The duration of unemployment benefits has been shortened several times during the period 1997-2005. Until 2003, for all those who were more than 55 years old and who had at least 25 years unemployment insurance unemployment benefits were provided until their hiring or retirement. According to the changes in 2005, those who had at least 15 years unemployment insurance and who were less than 5 years from obtaining an old person's pension continued to receive unemployment benefit until their hiring or retirement. The changes in duration of unemployment benefits in Macedonia over the period 1997-2005 are presented in Table 1.6.

Table 1.7 Duration of unemployment benefits in Macedonia (in months)

Duration of previous unemployment insurance	Duration of unemployment benefits		
	1997	2003	2005
9 months without interruptions or 12 months with interruptions during the last 18 months	3	3	3
15 months without interruptions or 24 months with interruptions during the last 3 years	5	4	3
30 months without interruptions or 50 months with interruptions during the last 5 years	7	6	4[a]
5-10 years	9	8	6
10-15 years	12	11	8
15-20 years	15	14	12
20-25 years	18	18	NA

Source: Law for Employment and Insurance in the Case of Unemployment

[a] *The required duration of previous unemployment insurance for this category is 24 months without interruptions or 36 months with interruptions during the last 4 years.*

[15] Replacement rate is regulated under article 68.
[16] Duration of unemployment benefits is regulated under article 71.

1.6.4 Coverage of unemployment compensation scheme

According to the data from the ESA, the number of registered unemployed who receive unemployment benefits varied between 32,362 in 1999 and 51,304 in 2004. At the same time the number of registered unemployed who receive free health insurance marked continuous increase from 191,470 in 1998 to 257,566 in 2005. Expressed in relative terms, the fraction of unemployed who are unemployment benefit recipients varies between 10 and 15 percent of the total number of registered unemployed. On the other hand, the fraction of registered unemployed who receive free health insurance is much higher and varies between 60 and 70 percent. The evolution of the figures of entitlement beneficiaries during the period 1998-2006 is presented in Table 1.7.

Table 1.8 Number of entitlement beneficiaries in Macedonia[17]

Year	Number of registered unemployed	Unemployment benefit recipients		Beneficiaries of health insurance	
		Absolute number	Fraction of registered	Absolute number	Fraction of registered
1998	235135	40713	14.8	191470	69.6
1999	250507	32362	9.7	203173	61.0
2000	275232	35002	9.7	212726	58.9
2001	332812	41375	11.8	220883	62.7
2002	361323	46772	12.6	230444	61.9
2003	352126	47324	12.3	238123	62.0
2004	372184	51304	13.0	245694	62.2
2005	383896	44267	12.1	257566	70.2
2006	357556	36228	10.1	242568	67.8

Source: Employment Service Agency (ESA)

Taking into account the average replacement rate of 45 percent and the number of beneficiaries, we can calculate the generosity index for Macedonia. Its average value for the period 1998-2006 is around 0.055. Compared with generosity indices of other transition countries presented in Table 1.4, Macedonia stands in the middle of the generosity range.

[17] The figures represent the numbers of beneficiaries in April each year; this month has been chosen in order to coincide with the previous reference period of the LFS.

1.6.5 Financing the unemployment compensation scheme

The financing of unemployment compensation scheme in Macedonia as in other transition countries combines various sources. In one part the ESA revenues directly come from the payroll tax levied on employers as a contribution to the costs of unemployment benefits. This contribution which is mandatory for all formally employed workers represents 1.6 percent of the gross wage. Having in mind that the amount provided from this source is generally insufficient the deficit in the ESA budget is covered by the general budget revenues.

The total expenditure of ESA in 2005 was 5,818 million denars, which includes unemployment benefits (36.2 percent), transfers to the Health Insurance Fund (29.5 percent), transfers to the Pension and Disability Fund (22.5 percent), expenditures on active labour market policies (8.6 percent) and other administrative expenditures (3.1 percent). The above amount represents about 1.86 percent of the Macedonian GDP, which is closer to the EU average than to the levels observed in other transition countries. Bearing in mind that the transfers to the Health Insurance Fund and Pension and Disability Fund represent a considerable part of the ESA expenditures, we can conclude that the high cost of the unemployment benefit scheme in Macedonia is due to the eligibility criteria for free health insurance rather then generosity of the unemployment benefits.

1.7 Disparity between LFS and registered unemployment

As previously noted, the two main indicators of the unemployment level in an economy are: LFS and registered unemployment. The latter is based upon the registration status of a person at the ESA, which as noted above depends on the eligibility as well as the willingness for registration (European Commission, 1999). Thus, the number of unemployed estimated from the LFS data will not in general coincide with the number of registered unemployed. In this section we first provide a rationale for analysing the disparity between the LFS and registered unemployment measures and second, we offer additional indicators that can be used in the investigation of this disparity.

When unemployment is high and stagnant, there exist a considerable number of workers on the borderline between unemployment and non-participation. Moreover, depressed labour markets are often characterised by non-standard forms of

employment that may also co-exist with the officially declared unemployment status of respondents. Therefore, the officially calculated unemployment rate may vary with respect to whether these borderline categories are included or not in the total number of unemployed (Brown et al., 2006). According to the estimations of World Bank (2003), by excluding the above categories the unemployment rate in Macedonia should be 10 percentage points lower than officially calculated LFS unemployment rate.[18]

We assume that the generosity of unemployment benefits affects the rate of registration of unemployed with the ESA. Generally, registered unemployment is higher if benefits from registering are higher relative to the costs. In the opposite case, if costs of registering are higher relative to the benefits, LFS figures remain higher (Mickiewicz and Bell, 2000; Vodopivec, 2000; Blanchflower, 2001). As we have seen, the benefits of registering do not mean only cash benefit payments to unemployed, but also the variety of entitlements such as eligibility for social assistance or free health insurance that are linked to the registration status. According to Boeri (2000), the large variation in unemployment benefits provided for registered unemployed, in addition to means-tested benefits that would cover all those who do not look for jobs, may significantly induce increased registration with employment offices. Furthermore, the incentives to register as unemployed in transition countries can be compounded by the possibility of also having informal employment or being a temporary emigrant. Thus, not only the generosity of unemployment benefits, but the possibility to exploit other income sources can be considered as significant determinant of unemployment duration (Kupets, 2005).

The simplest way for expressing the relationship between LFS and registered measures of unemployment is by using the ratio between them as presented in (1.1).

$$\text{LFS/R} = \frac{\textit{LFS Unemployment}}{\textit{Registered Unemployment}} = \frac{U_n + U_r}{E_r^i + I_r + U_r} \qquad \ldots (1.1)$$

where the symbols have the following meaning:

U_r - registered number of unemployed according to the ILO criteria;

U_n - not registered number of unemployed according to the ILO criteria;

[18] Similarly, according to the World Bank estimates the official unemployment rate in Bosnia and Herzegovina although around 40 percent is less than half of this level because many of those officially registered as unemployed have jobs in the informal sector (Falcetti et al., 2003).

E_r^i - employed in the informal sector and registered as unemployed;

I_r - inactive and registered as unemployed;

The LFS/R ratios for selected transition countries during the period 1992-2002 are presented in Table 1.8.

Table 1.9 LFS/R ratios for selected transition countries

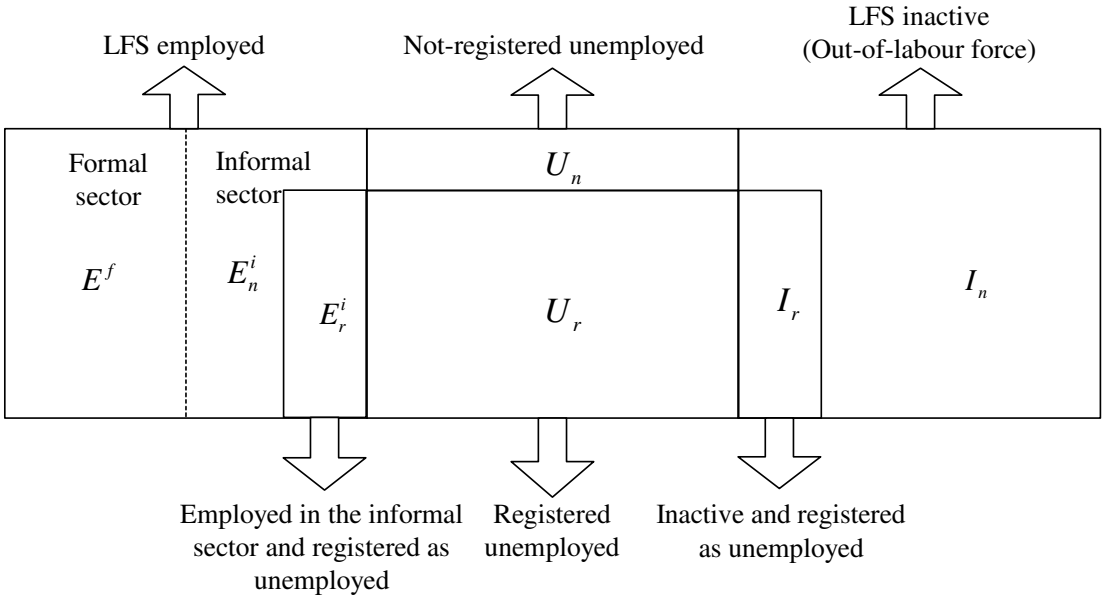
Country	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Croatia	-	-	-	-	0.65	0.63	0.69	0.73	0.83	0.73	0.68
Bulgaria	-	1.30	1.50	1.33	1.02	0.94	0.94	0.80	0.82	1.00	0.99
Czech Rep.	-	1.19	1.33	1.36	1.08	0.92	0.87	0.93	1.00	0.90	0.73
Hungary	0.67	0.82	0.87	0.84	0.84	0.75	0.77	0.70	0.70	0.68	0.69
Poland	0.95	0.84	0.87	0.87	0.89	1.05	0.99	1.02	1.03	1.02	1.07
Slovakia	-	-	0.91	0.93	0.88	0.88	0.84	0.86	0.93	0.98	0.95
Macedonia	**-**	**-**	**-**	**-**	**1.03**	**1.12**	**1.03**	**0.79**	**0.71**	**0.75**	**0.74**
Romania	-	-	0.79	0.97	1.20	0.80	0.71	0.70	0.82	0.91	1.11
Slovenia	-	0.66	0.67	0.55	0.55	0.55	0.59	0.60	0.65	0.56	0.57
Estonia	1.96	3.01	3.62	4.37	3.95	-	3.52	1.83	1.94	1.54	1.39
Russia	6.71	5.15	3.48	2.88	2.69	4.03	4.60	7.36	6.75	5.61	-

Source: ILO, LABORSTA Database

In Table 1.8 we can distinguish three different groups of countries. The first group consists of those countries with a relatively low LFS/R ratio (Macedonia, Slovenia, Croatia, Hungary and recently Czech Republic). In the second group are those countries with LFS/R ratio relatively close to 1 (Poland, Slovakia, Bulgaria, and Romania). Finally, the third group consists of countries with considerably higher LFS/R ratio (Estonia, Russia). Having in mind the previous exposition about the unemployment benefit systems in transition countries, it is possible to draw a link between the generosity of the unemployment benefit programmes and incentives to register. For instance, the Estonian benefit system is considered to be the least generous and its LFS/R ratio is the highest among transition countries. In contrast, the level of unemployment benefits relative to the average wage is highest in Slovenia and its LFS/R ratio is the lowest among transition countries.

We now turn to formal analysis of disparity between the LFS and registered unemployment in Macedonia. For this purpose we illustrate the possible interactions between them as depicted in Figure 1.8.

Figure 1.8 Conceptual framework for disparities between LFS and reg. uneml.



The LFS/R ratio is only a rough measure of the disparity and does not indicate the sources of disparity between the two measures of unemployment. The registered unemployment would completely coincide with LFS unemployment in a hypothetical case where the following categories were absent: (i) employed in the informal sector and registered as unemployed (E_r^i), (ii) inactive and registered as unemployed (I_r) and, (iii) not-registered ILO unemployed (U_n). These three categories can be called under a common name as 'falsely assigned' unemployed workers. However, it is possible that the figures for registered unemployed and those who are identified as unemployed according to the LFS coincide, although with different composition of the two measures. This assertion holds in the case where the sum of registered employed in the informal sector and registered inactive is equal to the number of not-registered ILO unemployed ($E_r^i + I_r = U_n$). Thus, disparities in the measures of unemployment can exist even in the case when the figures for unemployment according to both sources (LFS and registered unemployment) are equal.

In order to detect the sources of disparity between the two measures of unemployment, we introduce two additional indices. First, the gross disparity index (GDI) has been calculated as a sum of all falsely assigned unemployed relative to the union of the LFS and registered unemployment ($E_r^i + I_r + U_n + U_r$) as presented in (1.2)

$$\textit{Gross disparity index (GDI)} = \frac{E_r^i + I_r + U_n}{E_r^i + I_r + U_n + U_r} \quad \ldots (1.2)$$

The lower boundary of the GDI is zero, which corresponds to the absence of falsely assigned unemployed workers $(E_r^i + I_r + U_n = 0)$. The upper boundary of this index is unity. This is the case where falsely assigned unemployed totally dominate *i.e.* the intersection between registered unemployment and ILO unemployment is zero $(U_r = 0)$. Thus, higher values of GDI indicate higher disparity in the structure of the ILO and registered unemployment.

In addition, as a second indicator we use the net disparity index (NDI), which represents the difference between $E_r^i + I_r$ on the one hand and, U_n on the other hand relative to the union of the ILO and registered unemployment. Consequently, the net disparity index will be calculated according to expression (1.3).

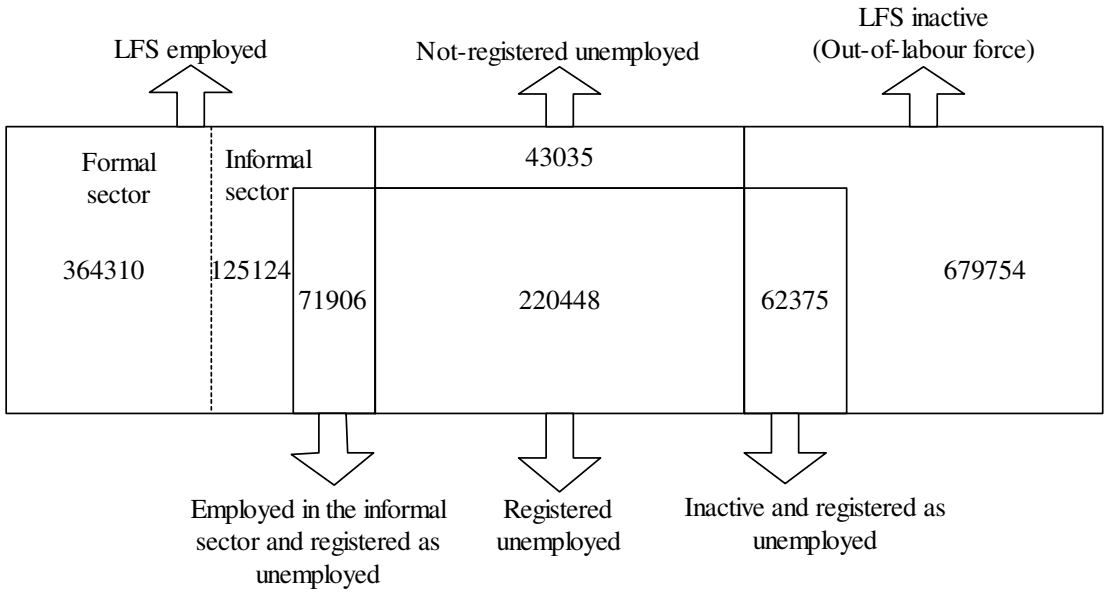
$$\textit{Net disparity index (NDI)} = \frac{E_r^i + I_r - U_n}{E_r^i + I_r + U_n + U_r} \quad \ldots (1.3)$$

The net disparity index is positive if $E_r^i + I_r > U_n$. This condition holds in the case of higher incentives to register as unemployed among informally employed and inactive. On the other hand, NDI is negative if $E_r^i + I_r < U_n$. We assume that this condition holds in the case of lower incentives to register. Consequently, the lower boundary of NDI is -1, which indicates a hypothetical case where all unemployed are falsely assigned as not-registered ILO unemployed. The upper boundary of NDI is 1, which indicates a hypothetical case where all unemployed are falsely assigned as registered employed in the informal sector and/or registered inactive.

Both of these indices can be used as indicators for deficiencies of unemployment benefits design. In the cases where GDI is high and accompanied by positive NDI we can assume that significant number of registered employed in the informal sector and registered inactive are eligible for unemployment benefits and/or other entitlements. Furthermore, it is reasonable to expect that the total number of registered unemployed in such case will be inflated over the number of ILO unemployed. On the contrary, a high value of GDI coupled with negative NDI would indicate the case where ILO unemployed have low incentives to register. In this situation the total number of registered unemployed will be lower than the LFS

figure. The conceptual framework as depicted on Figure 1.8 can be applied to the Macedonian labour market. Our calculated figures for 2002 are presented in Figure 1.9.

Figure 1.9 Disparities between LFS and registered unemployment in Macedonia



Source: Author's calculation based on 2002 LFS, Macedonian Statistical Office and ESA

We calculate the figures in Figure 1.9 by making the assumption that 35-42 percent of registered unemployed in Macedonia are not appropriately assigned according to the LFS, an assumption made by the European Commission's study (1999). Among these registered unemployed workers around 13-20 percent are not searching for *i.e.* are not available, whereas around 22 percent have jobs in the informal sector. These fractions of workers registered as unemployed correspond to about 8.4 percent of the total number of not-participants and 36.5 percent of the total number of informally employed respectively. Finally, it remains that 16.3 percent of the LFS unemployed are not registered at the Macedonian ESA.

The total number of unemployed estimated from the LFS is 263,483, while the tot al number of registered unemployed is 354,729. Thus the LFS/R ratio for Macedonia in 2002 was 0.74, which means that registered unemployment figure was inflated over the corresponding LFS figure. Furthermore, we calculate the two additional indices *i.e.* GDI and NDI, whose values are 0.45 and 0.23 respectively. According to these findings, we conclude that main source of disparity in Macedonia between the two measures represent falsely registered unemployed *i.e.* employed in

the informal sector (E_r^i) and inactive (I_r) registered as unemployed. These two categories represent more than three quarters of the total number of falsely assigned unemployed workers, whereas the remaining one quarter consists of not registered ILO unemployed.

Finally, we can link our assessment of the above unemployment measures to the generosity of Macedonian unemployed benefit system. Taking into account that relatively modest part of registered unemployed receives unemployment benefits, it is more likely that the incentives to register as unemployed come from eligibility for other entitlements such as free health insurance or acquiring eligibility for social assistance. Moreover, our results imply that there exists an inappropriate targeting of the provision of unemployment benefits and other entitlements related to the registration status. The targeting of the unemployment benefits can be improved if it is tied to the search behaviour of registered unemployed, which requires more stringent monitoring (Bardasi et al, 1999). The above results can be used as basis for modelling the sustainable rate of unemployment and undertaking further reforms of the passive labour market policy that would primarily concern the effects upon labour supply and improved targeting.

1.8 Conclusion

In this chapter we have critically assessed the general trends in the Macedonian labour market and related passive labour market policies. Our analysis shows that its features in a number of aspects resemble those typical of the transitional world. As in other transition countries, after the initial transitional shock the Macedonian labour market was characterised by falling participation and employment rates followed by period of stabilisation. However, the Macedonian labour market shares some features which are peculiar to SEECs. This is particularly relevant regarding the evolution of unemployment rate that sharply rose at the beginning of transition and has thereafter remained stagnant, reflecting the depressed characteristics of Macedonian labour market. We can generally distinguish several features of Macedonian labour market presented as follows.

First, unlike other transition countries open-unemployment existed in Macedonia and other countries originating from former Yugoslavia even before the start of transition. Second, the sharp increase in unemployment rate at the outset of

transition is in accord with the generally observed economic recession. Third, the Macedonian labour market is affected by strong segmentation, meaning that certain social groups such as youths, less skilled workers, and women, face a higher risk of unemployment than the rest of the labour force. Fourth, long-term unemployment prevails over the short-term unemployment implying likelihood of possible 'discouraged workers' phenomenon. Fifth, the sectoral reallocation of labour has been characterised by a significant increase of subsistence agriculture and other non-standard forms of employment at the expense of rapid shrink of employment in industry. Finally, given the rigidities in the standard adjustment through employment and wages, less traditional (in the western context) labour market adjustment mechanisms may play a more significant role.

The rationale for studying passive labour market policies arises from their implications for labour supply incentives and budgetary spending. The evolution of the Macedonian unemployment benefit system has followed a similar pattern to that found in other transition countries. Having in mind the sequence of restrictions on unemployment benefits generosity and prevalence of long-term unemployment, we have found a modest coverage of unemployment benefits. Furthermore, we have analysed the sources of disparities between the LFS and registered unemployment and claimed that they can be partly induced by inappropriate design of the unemployment benefit system. We have constructed two indices that in addition to the LFS/R ratio can be used for investigation of the above-mentioned disparity. In this context, we have revealed that the cause of the higher registered unemployment figures relative to the LFS unemployment is the group of falsely registered unemployed *i.e.* employed in the informal sector and inactive registered as unemployed. Having in mind the low coverage of unemployment benefits, we argue that incentives for registering as unemployed in Macedonia come from other entitlements. This creates potential moral hazard problem and suggests a further redesign of the Macedonian unemployed compensation scheme with respect to the existing labour market conditions. Furthermore, the passive labour market policies need to be analysed in relation with other labour market adjustment mechanisms, whereas the role they play should be evaluated with respect to the sustainable rate of unemployment. For this purpose in the next chapter we pursue with a critical assessment of the underlying theoretical background and providing an appropriate formulation of the sustainable rate of unemployment.

CHAPTER 2

A FRAMEWORK FOR THE ANALYSIS OF SUSTAINABLE RATE(S) OF UNEMPLOYMENT

2.1 Introduction

In the previous chapter we empirically examined the characteristics of transitional labour markets with an emphasis on the South-East European region and particularly Macedonia. We concluded that these latter labour markets demonstrate some peculiarities regarding the way they adjusted after the initial transitional shock. In general, they are characterised by a high degree of labour market segmentation, a long average duration of unemployment and a high reliance on non-traditional forms of labour market adjustment such as employment in the informal sector, non-participation and emigration. These findings together with the theoretical background that will be developed in this chapter will be used as a basis for establishing a framework for our analysis of the sustainable rate of unemployment.

In this chapter we first review two well-defined theoretically established concepts concerning labour market adjustment: the non-accelerating inflation rate of unemployment (NAIRU) frequently used for developed economies, and the optimal speed of transition (OST) models appropriate for the first phase of transitional labour

markets adjustment. The aim of this review is to identify gaps in the existing analysis, manifested in an inability to explain the specific pattern of labour market adjustment found in SEECs in the mature phase of transition. In order to overcome the identified shortcomings, we promote the concept of a sustainable rate of unemployment and introduce our approach to the analysis of labour market adjustments in SEECs. In other words, this chapter reviews the main theoretical background and introduces the key concepts that will be used as a basis for modelling the sustainable rate of unemployment developed in the remainder of the book.

The chapter is structured as follows. In section 2.2 we present a brief synthesis of the NAIRU hypothesis as one of the widely adopted labour market equilibrium concepts in developed economies. In this context, we cover issues such as the definition of NAIRU, its determinants, as well as the possible policy implications of NAIRU. This section also includes an explicit critique of the applicability of NAIRU to transition economies. In section 2.3 we review the optimal speed of transition literature, which encompasses a presentation of the main assumptions of OST models, their mechanism and determinants, their policy implications, as well as some shortcomings of the OST approach of modelling for our particular research programme. Furthermore, in section 2.4 we formulate a definition of the sustainable rate of unemployment and outline the research methodology that we pursue in the next steps of our analysis. Finally, in section 2.5 we present the main conclusions.

2.2 A Synthesis of the NAIRU hypothesis

One of the main themes in economics is the notion of equilibrium. In an environment where economic agents are assumed to follow utility maximising behaviour, equilibrium arises from the assumption that there exists, other things being equal, an outcome or outcomes of their interactions, without a tendency for further adjustment to occur. In the labour market, the economists have developed several equilibrium concepts. The natural rate of unemployment (NRU) replaced the concept of 'full employment' as the first formal equilibrium concept in the context of the labour market. More recently, the notion of the NAIRU has become the dominant definition of equilibrium, frequently used alongside NRU. Even though NRU and NAIRU are sometimes used as synonyms they are conceptually different notions (Estrella and Mishkin, 1998).

The origin of the NRU concept is rooted in Friedman's Presidential Address to the American Economic Association in 1968. The following fragment of Friedman's address represents a first attempt to define the NRU: 'The natural rate of unemployment is the level that would be ground out by the Walrasian system of general equilibrium equations, provided there is embedded in them the actual structural characteristics of the labour and commodity markets, including market imperfections, stochastic variability in demands and supplies, the costs of gathering information about job vacancies, and labour availabilities, the costs of mobility and so on' (Friedman, 1968: 8).

Nowadays, a long time after Friedman's rough sketch of NRU, this broad notion still attracts the attention of the academics and policy makers. Without going in details about the specific differences between NRU and NAIRU, in the remainder of this section we will attempt to disentangle the nature of the latter concept. Controversy mostly arises from the different points of view regarding the NAIRU definition, determinants of its dynamics through time or across countries and its policy implications. In what follows, we summarise the recent literature on the NAIRU in order to identify whether this concept can be applied to the case of transition countries. To some extent we also refer to the NRU literature particularly in the cases where we identify common points with NAIRU.

2.2.1 The definition of NAIRU

The easiest way to define NAIRU is by departing from the etymological meaning of this acronym. Thus, the NAIRU is the rate of unemployment consistent with constant (non-accelerating) inflation in the Phillips curve equation (Blanchard and Katz, 1997). In contrast, the expectation-augmented Phillips curve relates the deviation of the actual inflation rate from the expected inflation as a function of deviation of the unemployment rate from the NAIRU (Blanchard and Katz, 1997; Ball and Mankiw, 2002). Therefore, the concept of NAIRU arises from the inflation-unemployment trade-off, as a consequence of the changes in monetary policy pushing these two variables in opposite directions (Mankiw, 2001; Ball and Mankiw, 2002). Although empirically disputed, the inflation-unemployment trade-off is a theoretically well-defined macroeconomic concept. When unemployment is below NAIRU there is pressure for the inflation rate to rise and inversely, when

unemployment exceeds NAIRU there is pressure for the inflation rate to fall (Stiglitz, 1997; Nickell, 1998).

The formal derivation of the NAIRU is usually based on two benchmark equations (Layard et al. 1991; Blanchard and Katz, 1997). Using the terminology of Layard et al. (1991), one is the equation expressing the way in which wage-setters set wages relative to prices, while the other one expresses the way in which price-setters set prices relative to wages. The variable that enables consistency between the wage mark-up and price mark-up is the level of unemployment. Only when unemployment is at the equilibrium level will price and wage-setting be mutually consistent and thus a stable rate of inflation be maintained. Blanchard and Katz (1997) use the notions of 'price equation', which conceptually corresponds to the demand wage relation and 'wage equation', which corresponds to the supply wage relation. In both cases the solution of the system is assumed to be a unique equilibrium rate of unemployment, which is consistent with non-accelerating inflation rate. In an equilibrium unemployment context, Phelps (1995) points out the possibility of existence of 'natural zone' instead of a point, since the employment level to which firms will reduce their workforce when starting with an excess of employees is possibly greater than the level to which they will increase their workforce when starting with a deficiency.

Although an equilibrium concept, NAIRU does not imply market clearing (Layard et al., 1991). Labour market clearing implies a perfect matching process between the labour supply and labour demand. As Friedman pointed out in his presidential address to the members of the American Economic Association, the natural rate embeds the costs of gathering information about job vacancies as well as the costs of labour mobility between occupations and locations, which implies that some level of frictional unemployment will always exist. It is also worth mentioning the alternative view of the NAIRU path as endogenous, pushed like other economic variables by non-monetary forces (Phelps, 1995). This concept favours the new paradigm i.e. the 'non-monetary equilibrium theory of unemployment movements', which is an endogenously moving-natural rate theory.

Most of the NAIRU literature emphasises its importance as a long-run concept (Hahn, 1995; Ball, 1999; Ball and Mankiw, 2002). In the short-run, unemployment can deviate from the NAIRU, but in the long-run is assumed to return to a unique

NAIRU.[19] According to Nickell (1998), an exogenous shock to real or nominal demand has only a temporary impact on unemployment. Furthermore, Mankiw (2001) argues that price stickiness can explain why society faces a short-run trade-off between inflation and unemployment, but the dynamic relationship between inflation and unemployment has still not been fully explored. However, NAIRU itself is not static and will vary through time and across countries due to various factors which we now identify.

2.2.2 The determinants of NAIRU

The determinants of NAIRU and its variation through time and across countries are broadly separated into two major groups: shocks and institutional factors (Blanchard and Wolfers, 2000). In addition, the interactions of shocks and institutions can also produce intense effects on the NAIRU and therefore have to be separately assessed. According to Blanchard (2006) who analysed the origins of the 'European unemployment' problem, the initial rise in unemployment can be attributed to various shocks, whereas its persistence over time in some European countries is mainly due to the role of institutions.[20] In what follows we first elaborate various shocks, then institutions and, finally their possible interaction effects on the NAIRU.

Adverse shocks are often interpreted as reasons for an upward shifting NAIRU. First, reduced aggregate demand is frequently cited as a reason for rising equilibrium rate of unemployment in Europe but only if combined with wage rigidity (Snowdon et al., 1994; Blanchard and Wolfers, 2000). Second, we consider the shocks related to the demographic factors. Assuming that each demographic group has its own characteristic NAIRU, the changing demographic structure of the labour force implies a subsequent change in the overall NAIRU (Stiglitz, 1997). Moreover, according to Phelps (1995), a rising labour force can produce higher equilibrium unemployment through the rising marginal costs of training. The employability of the labour force defined as capacity of the unemployed to fill vacancies can also influence the NAIRU. As a consequence, for a given inflation path, unemployment is

[19] As we will see in section 2.2.2 this hypothesis holds if we exclude possible hysteresis effects.
[20] Blanchard points out that the 'European unemployment' problem is largely due to the high unemployment rates in so-called 'big four' (Germany, France, Italy and Spain), whereas majority of smaller EU countries no longer struggle with the problem of high and persistent unemployment.

inversely proportional to average employability, which implies that increased employability may reduce the NAIRU (Layard, 1996). Third, the 'wage aspiration effect' which refers to the workers' demands for increased real wages even in the absence of a corresponding increase in productivity growth, puts upward pressures on inflation and requires a higher level of unemployment in order to stabilise the rate of inflation (Stiglitz, 1997). Some authors relate this effect to the slowdown in total factor productivity growth that particularly affected Europe during the 80's and 90's (Blanchard and Wolfers, 2000; Blanchard, 2006). Fourth, increased exposure to competition in product and labour markets can also provide some wage restrictions, which ultimately affects the equilibrium rate of unemployment (Stiglitz, 1997; Nickell, 1998). Fifth, the increase in real interest rate can be considered as a potential explanatory factor for the upward shifting NAIRU (Nickell, 1998; Blanchard and Wolfers, 2000). Finally, hysteresis implies no unique NAIRU and explains why high unemployment can persist for a long time through the damaging effects of long duration on the skills of unemployed workers and limitations on their ability to compete for employment (Stiglitz, 1997). In the same spirit, some authors explain why the shocks in the past such as the oil shocks in the 70's have had long-lasting effects on the NAIRU (Blanchard and Wolfers, 2000; Blanchard, 2006).

Changes in the labour market institutions can also to some extent affect the equilibrium rate of unemployment. Snowdon et al. (1995) claim that reduction in the labour market flexibility is one of the most plausible explanations for the rising equilibrium unemployment rate in Europe during the 80's and 90's. In the same spirit, Nickell in several articles develops an exhaustive list of labour market institutions that influence the NAIRU (Nickell, 1997; Nickell, 1998). Among the identified relevant labour market institutions are the following: unemployed benefit system, union coverage, unions and employers coordination in wage bargaining, labour market rigidities, taxes on labour, skill and other forms of mismatch. Furthermore, Nickell (2003) emphasises that cross-country variations in unemployment are easy enough to explain by cross-country variations in labour market institutions. In addition, Blanchard and Wolfers (2000) make a distinction between three groups of labour market institutions: those, which increase the equilibrium unemployment rate, those which change the nature of unemployment and those, which do not have much effect either on the rate or on the nature of unemployment. Concerning the interactions between the shocks and institutions we locate two opposed empirical

findings. On the one side Blanchard and Wolfers (2000) find a significant effect resulting from their interaction whereas, on the other side, Nickell et al. (2005) argue that interactions between average values of institutions and shocks make no significant additional contribution to the understanding of unemployment changes.

In sum, we claim that the level of the labour market rigidities to a great extent determines the level of equilibrium rate of unemployment. With respect to this, we adhere to the group of authors who point out that those countries, which have not managed to implement more flexible labour market institutions face persistently higher rates of equilibrium unemployment (Siebert, 1997; Saint-Paul, 2004). Furthermore, the reasons for 'bad' equilibrium unemployment rate in some European countries, might be the obstacles to reform of labour market institutions such as: political economy factors (the powerful position of insiders), ideological factors, or agency problems which arise between public employment services and governments in the implementation of the labour market policies (Saint-Paul, 2004). A summary of our literature review concerning determinants of NAIRU is presented in Appendix 2.1.

2.2.3 Policy implications of NAIRU

One of the most controversial issues concerning NAIRU is the question, whether it is a useful concept in terms of drawing policy conclusions. As is often the case, economists do not have a unanimous point of view about its appropriateness for framing policy recommendations. One group of authors emphasise the importance of NAIRU in relation to the conduct of monetary policy. For instance, Gordon (1997) claims that an exact identification of the level of NAIRU can help policy makers to quantify the optimal monetary expansions without fear of triggering higher inflation or breaching an inflation target. In addition, Blanchard and Wolfers (2000) as an analytical tool propose comparison of the equilibrium with the actual unemployment rate, since decreasing inflation is likely to reflect an unemployment rate above the equilibrium rate, while increasing inflation reflects the reverse. In turn, monetary policy and other determinants of aggregate demand can exert a long-run effect on unemployment. A typical example is restrictive monetary policies conducted in periods of disinflation, which can cause a large increase in the equilibrium unemployment if they last a long time (Ball, 1999). This is relevant for SEECs and

particularly for Macedonia, where the actual period of disinflation lasted a long time and might have exerted structural changes on their labour markets.

Another group of authors are cautious about using NAIRU as a policy instrument and point out that unemployment explains only a portion of changes in inflation (Stiglitz, 1997). Consequently, as argued by Staiger et al. (1997), monetary policy should be informed by a wide range of variables and not just unemployment. In addition, they claim that other variables are as good or better at predicting inflation including: the capacity utilisation rate, other labour market variables, interest rates and some monetary aggregates. An extreme conclusion from those supporting the hysteresis argument is that a unique equilibrium rate of unemployment does not exist, or there is no rate of unemployment that is in general consistent with constant inflation, which in turn implies that the NAIRU concept is useless as a basis for the conduct of monetary policy.

In addition, as an alternative to these two different points of view, some authors propose concrete policy recommendations based upon careful analysis of the NAIRU. Most of them concern ways of tackling the problem of rising unemployment in Europe. For instance, Ball (1999) argues that European unemployment will most likely fall if demand expansion is coupled with appropriate labour market reforms. In addition, Blanchard and Wolfers (2000) argue that a more favourable macroeconomic environment and reforms of institutions should lead to a substantial decline in European unemployment. In a similar vein, Blanchard (2006) advocates alongside labour market reforms, reducing the NAIRU by more expansionary monetary policy, since institutional reforms encounter less opposition when economies are growing and unemployment is decreasing.

2.2.4 A critique of the applicability of NAIRU to transition economies

Considering the above-mentioned arguments regarding NAIRU and given the characteristics of 'transitional unemployment' examined in the previous chapter, it is dubious whether this concept can be applied in the context of transition countries. During the initial phase of transition the literature on labour markets in transition countries did not attempt to tackle this issue. To our knowledge, only recently have a few studies attempted to estimate the NAIRU for some transition countries. For instance, Bragin and Osakovsky (2005b) in a study for Russia estimated that actual

unemployment rate and NAIRU converge which indicates that the overall unemployment was primarily structural rather than cyclical character. Furthermore, Camarero et al. (2005) attempting to estimate the NAIRU for the new EU acceding countries, addressed the problem of the small sample common to all time series empirical analyses in transition countries. However, according to their estimates the equilibrium rate of unemployment is frequently changing, which can be attributed to political factors and/or frequent changes in the institutional framework. Notwithstanding these initial findings, we argue that the NAIRU concept cannot be applied in the case of transition economies. In the remainder of this section we identify several reasons that support our argument.

First, the NAIRU concept applies to a mature market economy in contrast to labour markets in transition countries which were set up only at the beginning of the 90's. In the pre-transitional period the allocation of labour as well as the allocation of other resources was centrally planned and open unemployment did not usually exist (Chapter 1). All countries at the beginning of transition had inaccurate measures of inflation and unemployment, since international statistical standards were still not implemented in practice. Moreover, the rapidly changing composition and quality of output makes any estimate of inflation somewhat arbitrary.

Second, the process of establishment of the labour market institutions in transition countries has been gradual. Labour market institutions that existed in the previous regime did not have an effective role in the labour allocation processes. Some of the labour market institutions were introduced from scratch at the beginning of transition, while others are subject of continuous adjustment. We have seen in section 2.2.2 that labour market institutions are considered as important determinants of the equilibrium rate of unemployment, and without their full development it is not possible to imply the existence of a unique NAIRU.

Third, most of the transition countries experienced high inflation rates in the initial phase of transition due to the price liberalisation, financial crises and macroeconomic instability. Subsequently, macroeconomic stabilisation policies were undertaken in order to curb inflation. Thus, it is evident that in transition countries there are other sources of inflation that cannot be explained by fluctuations in unemployment rate. The NAIRU concept is consistent with steady inflation and, can be applied only in the absence of frequent supply shocks. In this context, it is noteworthy that wage determination in depressed labour markets is predominantly

based on subsistence factors rather than the interaction of labour demand and supply. The relatively low demand for labour in SEECs implies that wage determination could not generally exert inflationary pressure via the 'wage-price' spiral.

Finally, unemployment in transition countries is characterised by a high proportion of long-term unemployed, which according to the duration theory is associated with human capital deterioration. This is accompanied by more intense presence of the state-dependency phenomenon demonstrated by a sharp decline in the exit rate as duration of unemployment increases[21] (Gregg and Manning, 1996). The long-term unemployed are not good fillers of vacancies due to their low level of employability (Layard, 1996). Having in mind that reductions in long-term unemployment do not exert inflationary pressures through the wage setting mechanism, the NAIRU mechanism in this case cannot easily be estimated.

In sum, in transitional labour markets there are mechanisms at work, which differ from those associated with the NAIRU. The necessary equilibrium concept for transitional labour markets is most likely related to their specific characteristics and labour market adjustment that occurred throughout transition. Our further task is to identify these characteristics and to propose a more appropriate concept of labour market adjustment and equilibrium in SEECs and particularly in Macedonia. For this purpose, in the next section we review the existing literature that covers the modelling of labour market adjustment in transition economies.

2.3 Review of the optimal speed of transition literature

If we argue that the NAIRU hypothesis is not appropriate as a labour market equilibrium concept in transition economies then a number of questions arise. Is there a sustainable rate of unemployment with respect to the goals of transition and consistent with the peculiar characteristics of transitional labour markets? What are the determinants of that sustainable rate of unemployment in transition economies? What policy implications can be drawn from models of the sustainable rate of unemployment? In order to answer these questions we next turn to reviewing an alternative strand in the literature concerning models that examine the determinants of the optimal speed of transition (OST).

[21] The 'state-dependency' phenomenon will be elaborated in details in Chapter 3.

There is an abundant literature which treats labour market outcomes in transition economies in the OST context. Most of the authors have attempted to model transitional labour markets in order to capture the processes of reallocation and restructuring and to identify the determinants of the optimal speed of transition (Aghion and Blanchard, 1994; Blanchard, 1997; Blanchard and Keeling, 1998; Raiser et al., 2003). For instance, Burda (1993) develops one of the first OST models based on a matching function that describes the exits flows from unemployment to jobs, given the stock of unemployment and vacancies. A group of authors such as Chadha and Coricelli (1994) and Commander and Tolstopiatenko (1996) focused on the impact of taxation policies in transition economies, while Atkeson and Kehoe (1996) examined the effect of the social insurance schemes on the optimal speed of transition. In addition, Ruggerone (1996) introduced the effects of inflationary shocks on the transitional outcomes. Garibaldi and Brixiova (1998) have evaluated the effects of unemployment benefits and a minimum wage on the process of labour reallocation, whereas Brixiova et al. (1999) have examined the link between the availability of skilled workers and the creation of private firms in transition economies. Most of the OST models adopt a partial equilibrium approach, though Castanheira and Roland (2000) present a dynamic general equilibrium approach. One decade after the start of transition several authors summarised the labour market outcomes in transition countries and presented exhaustive reviews of the literature concerning the optimal speed of transition with an attempt to contrast various aspects of these types of models (Boeri, 2000; Roland, 2000). Recently, Tichit (2006) has re-examined the OST models by introducing new features such as the presence of job destruction in the new private sector and the direct reallocation of labour from the state to the private sector.

Some of the labour market adjustment mechanisms, which are characteristic of SEECs, have already been incorporated into OST models. For instance, Mancellari et al. (1996) and Papapanagos and Sanfey (2003) in an extended OST model, have identified the effects of emigration on the labour adjustment in transition countries. We can also observe several attempts at introducing employment in the informal sector within the OST framework (Bouev, 2001; Bouev, 2004). Finally, Bruno (2005) develops an OST model with a shrinking labour force, thus considering the increasingly important phenomenon of rising non-participation in transition countries. The common feature of the above-mentioned OST models is that the adjustment

mechanisms are partial, in the sense that only one mechanism is considered at a time, implying that they cannot entirely explain the reality of labour market adjustment in SEECs in the later phase of transition. We will attempt to fill this gap in Chapter 7 by developing our own model of the sustainable rate of unemployment.

2.3.1 Assumptions of OST models

Stylised OST models frequently attempt to describe transitional labour markets by dividing employment into two sectors: state and private[22] (Burda, 1993; Aghion and Blanchard, 1994; Chadha and Coricelli, 1994; Commander and Tolstopiatenko, 1996; Blanchard, 1997; Garibaldi and Brixiova 1998). According to Jurajda and Terrell (2002), the shared essence of the various OST models are macroeconomic mechanisms which make the pace of job creation in the private sector depend on the speed of job destruction in the state sector. Alternatively, Boeri (2000) makes a distinction between the 'old sector' and 'new sector'. The 'old sector' comprises the state and privatised enterprises which struggle with the same problems in undertaking the process of restructuring, whereas the 'new sector' consists only of *de novo* private firms. In this context, privatised enterprises are expected initially to have a level of productivity close to that observed in the state enterprises unless new owners make considerable investments in new technology and organisation. Consequently, privatised firms may not have enough capacity to hire new employees and in most cases they shed a portion of existing employees.

Initially, employment was entirely concentrated in the state or 'old' sector, and started to decline immediately after the start of transition process. Jurajda and Terrell (2002) point out that job destruction in the 'old' sector and job creation in the 'new' sector at the beginning of transition represent the most important starting assumptions for the OST models. As analysed in the previous chapter, there are several adverse shocks that triggered the decline of the state sector at the beginning of transition such as: macroeconomic stabilisation, price and trade liberalisation and the collapse of the trade within the Council for Mutual Economic Assistance (CMEA) (Burda, 1993; Aghion and Blanchard, 1994). Disruptions in production and trade that faced the state firms after the disappearance of the central planning system, also

[22] Most of the authors also consider the efficiency criteria, making a distinction between the inefficient state sector and efficient private sector.

known as disorganisation, also led to lower output in this sector (Blanchard, 1997). Additionally, hardened budget constraints as a consequence of the removal of subsidies, have contributed to the state sector collapse and induced its restructuring. According to Blanchard (1997), restructuring has not only involved change in ownership, but also changes in the structure and the organisation of firms. Employment in the state sector was initially characterised by pronounced labour hoarding and the process of restructuring implied a reduction of employment and increase in unemployment or inactivity. Unlike other OST models, the model of Garibaldi and Brixiova (1998) allows for heterogeneity in the state sector, which means that labour productivity in the state sector can vary and subsequently influence restructuring decisions.

The basic assumption of the OST models is that productivity in the private sector is higher than the productivity in the state sector. Hiring in the private sector is modelled as a function of the exit rate from unemployment to employment (Aghion and Blanchard, 1994; Blanchard, 1997). Furthermore, the exit rate from unemployment can be used as a proxy for the labour market tightness. A lower exit rate from unemployment puts downwards pressure on wages, thus exerting an increase in demand for labour in this sector (Tichit, 2006). However, the rise of the private sector is constrained by a number of limitations such as: (i) limited access to external finance (Aghion and Blanchard, 1994; Blanchard and Keeling, 1998); (ii) the presence of hyperinflation, characteristic of the initial stage of transition (Ruggerone, 1996); (iii) slow pace of investment in organisation capital (Atkeson and Kehoe, 1997); and, (iv) depreciation in the human capital acquired under previous regime (Brixiova et al., 1999).

In the OST literature, labour markets adjustment in transition countries is based upon two unrealistic assumptions that have been criticised by Boeri (2000). First, labour supply is supposed to be constant, which means that there is only a distinction between three labour market states: employment in the state sector, employment in the private sector and unemployment. As we will see in Chapters 3, a large number of workers from declining state sector transferred into inactivity instead of unemployment. Additionally, increased emigration is an important factor, since it significantly affects the size of the domestic labour force in many transition countries. This critique is particularly important for the transition countries of South-Eastern Europe where the labour force during the first phase of transition substantially

declined due to increased inactivity and emigration. The second assumption of labour market adjustment in transition economies points out the intermediary role of unemployment, which means that laid-off workers from the state sector are supposed to experience spells of unemployment before becoming re-employed in the private sector. In short, this assumption does not recognise the importance of job-to-job movements in practice, *i.e.* direct shifts of workers from state to private employment. By neglecting these flows, the adjustment process in OST models is generally over-simplified and leads to inappropriate policy conclusions being drawn. A detailed analysis of the labour market flows in transition countries which aims to justify these criticisms is presented in the following chapter.

2.3.2 Key mechanisms and determinants of OST models

The phenomenon of open unemployment, which generally did not exist in pre-transitional period, has arisen as a consequence of the diverging development paths of two above-mentioned sectors throughout transition. According to Aghion and Blanchard (1994) there exists a sustainable rate of unemployment associated with the optimal speed of restructuring, such that the flow into unemployment from restructuring is just absorbed by the rate of private job creation. This optimal speed of transition has been also known as balanced path of transition (Blanchard, 1997). According to their model, whether an economy enters into the balanced path depends not only upon initial conditions but also on the particular design of labour market institutions. This insight can explain, to some extent, why transition countries have experienced different patterns of transitional reforms.

The feedback mechanisms in the OST models can be divided into two distinct groups: fiscal pressures and political economy factors (Boeri, 2000). According to the first mechanism, increasing fiscal pressures arise from the need to finance the unemployment benefits of the growing number of unemployed. Some authors suppose the same tax burden imposed on both sectors (Burda, 1993; Aghion and Blanchard, 1994), others that the payroll tax rate for the private sector is smaller than the payroll tax rate for the state sector (Commander and Tolstopiatenko, 1996; Blanchard and Keeling, 1998), or even no taxation of the private sector (Chadha and Coricelli, 1994). Having in mind that most transition countries have introduced lower

payroll taxes for the private sector in order to encourage its development, we can argue that assumption of multiple taxation regimes is appropriate.

According to the second mechanism, the restructuring decision is treated as endogenous and depends upon various political economy factors. With respect to this, the unemployment rate influences the decision of workers in the state firms to acquiesce to the process of restructuring. If the initial level of unemployment is very high and the outflow rate from unemployment is low, workers in the state firms are reluctant to accept restructuring, while in the case when the initial level of unemployment is low it is more likely that restructuring will be accepted (Blanchard, 1997). Castanheira and Roland (2000) point out that a high rate of closure of state-owned enterprise in the earlier stage of transition can have contractionary effects expressed in sub-optimally low investment and a slower process of private job creation.

The role of labour market institutions is often stressed as an important factor in the determination of the sustainable rate of unemployment along the balanced path of transition. Some authors point out that, differences in labour market dynamics should be analysed together with differences in labour market institutions (Garibaldi and Brixiova, 1998). More precisely, Garibaldi and Brixiova (1998) analysed the effects of differing unemployment benefits and minimum wages in causing cross-country differences in unemployment dynamics. According to them, higher unemployment benefits speed up job destruction (restructuring) in the state sector at the early stage of transition, but they increase unemployment in the steady state. Blanchard (1997) obtains similar results for the effects of unemployment benefits in the early stage of transition. Atkeson and Kehoe (1996) identified that social insurance speeds transition because it diminishes income risk when unemployed, and makes it more attractive relative to staying in the state sector. However, they also found that the optimal speed of transition with social insurance may be lower than the equilibrium speed without social insurance. In addition, a higher minimum wage can theoretically speed up the reallocation process without affecting the long-run equilibrium (Garibaldi and Brixiova, 1998). Generally, any labour market institution that makes unemployment more attractive induces acceleration in the process of job reallocation between the low-productivity jobs in the state sector and high-productivity jobs in the emerging private sector (Garibaldi and Brixiova, 1998).

While the above studies document well the impact of labour market institutions on the optimal speed of transition, the role of labour market adjustment mechanisms has been assessed to lesser extent. A link has been already established between the growing informal sector and ability of the governments to provide public goods in the official sector via the system of tax collection. In this direction, Johnson et al. (1997) developed a simple model of a transition labour market with multiple equilibria, where the feedback mechanism is based upon the level of taxation and provision of public goods in the formal sector of the economy. Commander and Tolstopiatenko (1996) analysed tax incidence across state and private sectors and showed that widespread tax avoidance by the private sector, which implies a high level of unofficial economy, can stimulate its growth and result in faster overall speed of transition. From another point of view, Brixiova et al. (1999) found that the lack of skilled workers in transition economies discourages entrepreneurs from searching for business opportunities, which pushes workers into the informal sector.

Although emigration at the outset of transition has grown in almost all transition countries, it has been rarely treated as a possible determinant of labour market adjustment. Papapanagos and Sanfey (2003) argue that the effects of increased emigration on labour market adjustment can be ambiguous. Since, according to their OST model, emigration may increase the pace of job creation in the private sector by reducing social security payments to the unemployed by the government and lowering the required level of taxes. Even if emigration slows down job creation as a result of insufficient skilled labour, it may be still be optimal for the government to speed up the reallocation process, as effective unemployment within the country is reduced. These results concerning the effect of emigration on the speed of transition are in line with the previous findings of Mancellari et al. (1996), according to which emigration has a positive effect on job creation in the private sector through the effects of remittances and increased skills of returned migrants.

2.3.3 Policy implications of OST models

Bearing in mind the assumptions as well as the mechanisms incorporated in most OST models, they have frequently been used to develop the formulation of policy measures. With respect to this, the OST models on the one hand have been considered as very important, while on the other hand given their extreme abstraction

have to be used with caution when framing policies (Atkeson and Kehoe, 1997). According to Boeri (2000) there are four main policy implications that can be drawn from the OST literature, some of them reconsidered in Chapter 8 where we summarise the recommendations arising from our model of sustainable rate of unemployment.

The first issue concerns the magnitude and timing of reductions in subsidies to state firms. This includes decisions about hardening budget constraints to the state firms at the outset of transition. Generally the predictions from the OST models are consistent with the empirical evidence suggesting that governments which imposed stricter budget constraints on state firms experienced sharper increases in unemployment in the first phase of transition followed by a gradual decrease in the second phase, the typical example being some of the CEECs (Blanchard 1997; Tichit, 2006). On the other hand, governments that had a more paternalistic approach and tolerated soft budget constraints for a longer time, experienced low unemployment in the first phase of transition followed by significant increases in the second phase. In this group of countries are generally included the FSU countries (Chapter 1).

A second policy implication is related to the generosity of unemployment benefits. Unemployment benefits increase the welfare of the unemployed, thus helping the process of restructuring. At the same time they impose fiscal pressures and, via increased tax burden, obstruct job creation in private firms. Again, the predictions of the OST models are in line with the empirical evidence from the 'natural experiment' described in Chapter 1, which entails favouring higher unemployment benefits in the first phase of transition followed by subsequent restrictions in the second phase. However, the empirical evidence shows that a reduction in unemployment benefits' generosity in the mature phase of transition has not always contributed to decreases in the high unemployment rates (Boeri, 1997; Ham et al., 1998; Van Ours and Vodopivec, 2006).

A third policy implication concerns the form and speed of privatisation. As previously mentioned, privatisation of state firms can be policy induced, but may also depend on the willingness of insider employees. Transition countries adopted a number of privatisation strategies that resulted in a diversity of outcomes with various degree of success. Privatisation does not necessarily mean restructuring, because privatised firms inherit their labour and capital structure from the state system. Small-scale privatisation has been identified as the most important in creating a basis for

advances in several other related reforms since it creates lobbies for further reform (Barlow and Radulescu, 2005).

Finally, OST models propose policy measures regarding the deficit financing of social policies over the course of transition. From one side, social policies help to offset the negative effects of restructuring associated with rising unemployment. On the other, they may conflict with the strict borrowing constraints related to the implementation of stabilisation policies and can exert a negative impact on the economic reform. In order to avoid the 'fiscal trap' and its negative consequences, the system of private sector taxation must be carefully designed with respect to perceptions of its fairness by employers as well as its impact on sustainability of the balance between the budget revenues and expenditures.

2.3.4 Some shortcomings of OST models

In this section we attempt to list the main shortcomings of the OST models in order to spot their weak points that we will need to address in developing our model of sustainable rate of unemployment. We start with the phase of transition: OST models were conceived to analyse behaviour in the first phase of transition when the major labour reallocation occurred between declining state sector and growing private sector. These models are not fully applicable to the mature phase of transition when the processes of ownership restructuring and sectoral reallocation have been largely achieved.

Second, in most OST models it is assumed that the majority of labour reallocation occurs from declining state to the expanding private sector. According to this assumption, there is no difference between newly created private firms and privatised firms. In fact, a number of studies show that *de novo* private firms are much more dynamic in terms of job creation compared with both state-owned and privatised firms (Bilsen and Konings, 1998; Bojanec, 2004). In this context, newly created private firms are considered as the driving force of the so-called 'creative destruction' meaning that during transition, unproductive jobs in the state sector are destroyed and replaced with new more productive jobs in the emerging private sector. Considering newly created and privatised firms as a common group can lead us to underestimate the absorption capacity of the emerging private sector. Therefore, we

have to differentiate the newly created from privatised firms in order to estimate the true effects of transitional reallocation.

Third, the assumption of the constant labour force size throughout transition is difficult to sustain (Boeri, 2000; Bruno, 2005). There are in general two channels through which the size of the labour force in transition countries adjusted after the initial transitional shock. The internal channel includes the flows either from employment or unemployment to out-of-labour force. These transfers were frequently large and need to be assessed in order to determine to what extent they influence the size of the labour force. The external channel encompasses the reduction of the labour force through emigration of either the employed or unemployed population. Consequently, the assumption of diminishing labour force size, particularly in SEECs, may be more realistic and should be considered in the determination of the sustainable rate of unemployment.

Fourth, employment in the large informal sector, a key characteristic of transitional labour markets, is rarely treated in the OST literature. Due to a number of reasons related to the depressed characteristics of transitional labour markets, the absorptive capacity of employment in the formal part of the private sector is limited. A main assumption of the OST models is that private sector growth takes time. Thus employment in the informal sector, along with the possibility of exiting the labour force, arises as a consequence of the absence of employment opportunities in the formal labour market. Nowadays, most transitional labour markets can be characterised as dualistic. Their dualism consists of a contrast between the high level of job security in the formal employment and the considerably lower level of job security in the informal employment.

Fifth, the OST literature neglects the hysteresis phenomenon which may be particularly relevant in SEE bearing in mind the pronounced persistence of high unemployment rates in this region (Leon-Ledesma and McAdam, 2003). As explained above, this analysis emerged as a possible explanation for the persistently high unemployment in the already mentioned 'big four' European countries (Cross, 1988; Snowdon et al., 1994; Roed, 1997; Gocke, 2002; Blanchard, 2006). Hysteresis, most broadly defined as permanent effects of temporary shocks, has been explained by duration and insider-outsider theories (Blanchard and Katz, 1997). According to the duration theory, the long term unemployed suffer a depreciation of their human capital and as a result become increasingly unemployable. On the other hand, insider-

outsider theory attributes the hysteresis effect to the power of insiders, who prevent the downward adjustment of real wages in the face of a contractionary shock but bargain for an upward adjustment of wages when demand conditions improve (Lindbeck and Snower, 1989).

Finally, OST models rarely explore the possibility of multiple equilibria. The possibility of multiple equilibria in the macroeconomy and particularly in the labour market has been recognised in the literature (Manning, 1990; Sessions, 1994). The possibility of multiple equilibria outcomes in transitional labour markets has been treated in some OST models, but their sustainability is rarely considered (Burda, 1993). The diversity of performance across time and country suggest that it may be useful to explore the possibility of multiple equilibria in transitional labour markets. In the case of transition countries it is particularly interesting to test for a 'lock in' phenomenon, which means whether once a new equilibrium regime is attained, there is a tendency for the economy to remain there for a long time (Bianchi and Zoega, 1998; Leon-Ledesma and McAdam, 2003).

2.4 The sustainable rate of unemployment in transition countries

After reviewing the NAIRU and OST literature, our next goal is to present a formulation of the sustainable rate of unemployment in the context of transition in SEE and to introduce our research methodology. From our review of the NAIRU literature we reached conclusion that the sustainable rate of unemployment in transition economies cannot be simply related to the dynamics of inflation rate. In addition, the OST literature provides insights into appropriate assumptions as well as some of the possible mechanisms of labour market adjustment during transition. Accordingly, our modelling of the sustainable rate of unemployment in transition economies will be predominantly based upon our critical assessment of the OST models.

2.4.1 Defining the sustainable rate of unemployment

Identification of determinants of the sustainable rate of unemployment requires *a priori* a precise definition of the concept. To our knowledge, a consistent definition of sustainable rate of unemployment in transition countries has not been formulated. Some authors such as Blanchard (1997) in the spirit of the OST literature

deal with the notion of an equilibrium unemployment rate along the balanced path of growth. This definition is related to the determination of the optimal pace of labour reallocation from declining state sector to the growing private sector via unemployment, which is, at best, only appropriate for the first phase of transition. The experienced 'jobless' growth during the mature phase of transition in most of the SEECs and persistence of the high unemployment rates over a long period of time imposed the need to introduce a new concept of equilibrium unemployment rate related to the fiscal sustainability and presence of non-traditional forms of labour market adjustment.

An important prerequisite for the definition of the sustainable rate of unemployment is identification of the following issues: (i) the objective function that policy makers seek to accomplish, (ii) forces that facilitate achieving these objectives and, (iii) circumstances or constraints that frame the form of labour market adjustment in SEECs. Among the various objective functions we consider balancing the government budget as important in providing successful achievement of transition. Accordingly, in the most restrictive case the sustainability principle assumes that expenditures for social security programmes covering those not in formal employment are completely financed by the revenues from the taxes levied on employment in the formal sector. Furthermore, this principle can be generalised by allowing for the possibility that government may cross-subsidise between different tax and expenditure categories.

In our view, the driving force of labour market adjustment during transition is job creation in the formal part of the private sector. Restructuring through job creation is defined as a process of structural changes consistent with convergence towards the employment structure of developed EU economies (Mickiewicz, 2005). This process of restructuring can be achieved by boosting the growth of the private sector alongside a gradual downsizing of the state sector. However, as in the case of less developed transition countries, weak growth of the private sector prevents the achievement of the conditions necessary for convergence. Therefore, all factors that slow down the growth of the formal part of the private sector are considered as impediments, while those that strengthen private job creation assist the early achievement of the restructuring process. As demonstrated in Chapter 1 'transitional unemployment' occurred as a consequence of a restructuring process, however with striking differences between successful and less successful transition countries

regarding its size and duration. In this context, the financing of labour market policies aiming to cope with the unemployment problem became an increasingly difficult task, particularly in less developed transition countries such as SEECs.

The weak performance of the less developed transitional labour markets may indicate that conventional forms of labour market adjustment have been exhausted or are being complemented by alternative labour market adjustment mechanisms such as employment in the informal sector, non-participation and emigration. From the individual point of view these labour market adjustment mechanisms alleviate the social consequences of persistent unemployment by providing income support for those who are deprived of employment in the formal sector. At the macro level, the importance of these labour market adjustment mechanisms can be viewed in terms of their impact on the budgetary balance. For instance, the existence of a considerable informal sector can substantially reduce budget revenues, but on the other hand can have positive impact on the entrepreneurial spirit and aggregate demand. Similarly, increased non-participation may impose an additional financial burden in financing the social programmes for the economically inactive population. Last but not least, emigration as an adjustment mechanism can be considered beneficial in terms of a direct reduction of unemployment and increase of domestic expenditure via remittances, but harmful if it deteriorates the quality of the domestic labour force.

By taking into account the above-mentioned aspects of labour markets in SEECs we formulate the sustainable rate of unemployment as the rate associated with job creation in the formal sector that provides a balance between the revenues collected from payroll taxes together with social security contributions levied on the formally employed and expenditures on social programmes that cover the unemployed and inactive population, taking into consideration the impact of existing labour market adjustment mechanisms. A further goal of this research is to determine for each of the above-mentioned adjustment mechanisms and passive labour market policies the role they play in determination of the sustainable rate of unemployment. We also have to take into consideration that given the initial labour market conditions and peculiar forms of labour market adjustment, multiple equilibria outcomes may exist. Therefore, instead of assuming a unique sustainable rate of unemployment we should investigate various scenarios that may generate different unemployment rates considered as sustainable dependent on circumstances. In the next section, after explicitly stating our key research issues we provide a brief outline of the research

strategy we applied in exploring the determinants of the sustainable rate of unemployment in SEECs.

2.4.2 Introduction to our research methodology

Modelling the sustainable rate of unemployment as defined above is not a simple task since many problems arise in deciding upon appropriate assumptions, identifying the possible determinants as well as the relevant mechanisms. Having in mind the previous theoretical foundation, our assumptions should be critically assessed and adapted to the labour market reality in SEECs. Furthermore, the possible determinants of the sustainable rate of unemployment will be sought among the peculiarities of their labour markets, whereas the mechanisms at work will attempt to bring together individual decision-making and macroeconomic policy considerations. Accordingly, in this research we intend to explain the determinants of the sustainable rate of unemployment in the light of the established theoretical framework. At the heart of this analysis, we address two research issues. First, we are interested in assessing the role of the non-traditional labour market adjustment mechanisms in SEECs from the perspective of their capacities to absorb a part of the unemployed workforce, as well as their impact on the above-defined budgetary balance. Second, we intend to explore the effectiveness of passive labour market policies in order to assess whether their redesign could improve labour market performance and eventually reduce the high unemployment rates in SEECs and particularly in Macedonia.

Since the context of our research has now been presented, in this section we outline the research methodology that we pursue in the analysis of the determinants of the sustainable rate of unemployment. In order to gain insights into the adjustment processes at work in the transitional labour markets and particularly in SEECs in Chapter 3 we will analyse the characteristics of the main labour market flows. In this context, our task is to detect the 'bottlenecks' in the functioning of transitional labour markets and to find out the reasons for the stagnant unemployment. For this purpose we will separately consider the job turnover consisting of the processes of job creation and job destruction and, labour turnover which covers the flows of workers between the basic labour market states. As a useful tool of analysis we will apply a

stock-flow model adapted to the reality of transitional labour markets and estimate the transition probabilities between the labour market states.

Having in mind the high and sustained unemployment in SEECs, we anticipate the importance of less conventional forms of labour market adjustment in addition to the traditional forms of adjustment through employment and wages. In particular, we consider as potential determinants of the sustainable rate(s) of unemployment in SEECs employment in the informal sector (Chapter 4), non-participation (Chapter 5) and finally emigration (Chapter 6). The analysis in these chapters combines a critical consideration of the theoretical aspects of the above-mentioned phenomena and review of the empirical evidence that examines their origins, determinants and possible consequences for the sustainable rate of unemployment. Taking into account the limited data sources available for the early stage of transition as well as its questionable reliability, we are unable to utilise time series analysis. Instead, we resort to empirical analyses based on cross-section data in the mature phase of transition. In addition, the investigation of the interactions between the unemployment rate and above labour market adjustment mechanisms will enable us to identify their capacity to absorb a part of the unemployed workforce. In our analysis in these three chapters we will distinguish between three levels of generalisation. First, at most general level we consider the transitional world as a whole. Second, we treat more specifically the labour market characteristics of SEECs, since they share common economic, political and social background that allows a deeper comparative analysis. Finally, we focus on the labour market characteristics of Macedonia as our particular case study.

After assessing non-traditional forms of labour market adjustment, in Chapter 7 we formally model the sustainable rate(s) of unemployment in SEECs. For this purpose, a rigorous mathematical model is developed by bringing together the relevant determinants identified in our previous analyses. The model is calibrated with parameter values that reflect the characteristics of the depressed labour markets identified in our analyses. Comparative static analysis is initially used in order to understand the underlying factors that influence job creation, wage formation, participation decisions and to examine the possibility of multiple equilibria. In addition, the dynamic behaviour of the labour market will be also explored by simulating various evolutionary scenarios. Bearing in mind the rapidly changing transitional economic environment, we urge caution in not over-interpreting results

from our modelling of labour market dynamics. In experimenting with various policy regimes and examining their impact on labour market development over time, we consider a relatively short time horizon.

The final goal of the research is an evaluation of the policy implications and proposal for a policy package intending to promote an improved performance of Macedonian labour market (Chapter 8). For this purpose, the current labour market policy measures are critically assessed, emphasising the corresponding strengths and weaknesses. Our policy recommendations concentrate upon our two previously explored areas: the design of an appropriate unemployment benefit system and policies toward labour market adjustment mechanisms. The proposed package of complementary policies is designed to foster job creation in the formal sector and encourage greater labour supply.

2.5 Conclusion

In this chapter we have critically assessed two strands of literature concerning labour market equilibrium, *i.e.* NAIRU and OST, with the aim of providing a suitable background for research of the sustainable rate of unemployment in SEECs. In this context, we have first argued that the NAIRU concept cannot be easily applied to transitional labour markets. We supported our claim by several arguments such as: weak labour market institutions, high incidence of inflationary shocks, the high proportion of long-term unemployment and the scarcity of required data evident in most transition countries. Despite recent attempts by some authors to estimate the NAIRU for some transition countries, we are rather sceptical about its appropriateness as a policy tool in the context of transition. As a consequence, we have proposed a new concept of the sustainable rate of unemployment that reflects the peculiar nature of labour adjustment found in SEECs.

Second, we examined the OST models by reviewing their main assumptions, key mechanisms and possible policy implication. In addition, we highlighted several shortcomings which explain our decision to reject the OST approach to modelling the sustainable rate of unemployment in SEECs. In this context, we have stressed that they do not account for the following issues: the main labour market flows in mature phase of transition, reductions in the labour force, the importance of employment in the informal sector, differences in productivity between various labour market

segments, and the possibility of multiple equilibria. Even though some of the OST models have partially overcome the above deficiencies, we have decided to adopt only part of their assumptions and mechanisms in our modelling of the sustainable rate of unemployment.

Finally, we have provided a definition of the sustainable rate of unemployment and outlined the research strategy that we follow in the remaining chapters of the book. We defined the sustainable rate of unemployment with respect to specified objective function, the main driving forces and peculiar constraints encountered during labour market adjustment in SEECs. With respect to this, we have paid attention to the balance between revenues from payroll taxes imposed on employment in the formal sector and expenditures on passive labour market policies in providing incentives for the reallocation of workers between formal employment and alternative forms of labour market adjustment. In general, our research strategy consists in analysis of these alternative adjustment mechanisms complemented with formal modelling of their impact on the sustainable rate of unemployment. The final goal of this research is to provide insights to assist the design of reforms in the areas of passive labour market policies and the appropriate treatment of these labour market adjustment mechanisms.

CHAPTER 3

ANALYSING LABOUR MARKET FLOWS IN MACEDONIA

3.1 Introduction

In the previous chapter we established the conceptual framework for analysis of the sustainable rate of unemployment in transition countries and identified the main building blocks of our methodological approach. In this context, the capacity for labour reallocation has been pointed out as an important factor that determines the optimal allocation of resources in the economy. Supposing that the allocation of resources in the former centrally-planned economies was far from being optimal, the reallocation of labour that occurred during transition was expected to improve the aggregate productivity level. According to the principle of 'creative destruction', jobs in the less productive sectors should have been replaced by new jobs in more productive sectors, creating opportunities for an increase in aggregate productivity and economic growth.

Bearing in mind the systemic character of transition, we would expect labour markets in transition countries to be highly dynamic. At the beginning of transition, labour market adjustment was associated with labour shedding from the declining

state sector and improving employment possibilities in the growing private sector. However, as we discovered in Chapter 1, the SEECs are still struggling with the problem of high unemployment, and particularly long-term unemployment, despite the private sector nowadays having a dominant share in their economies. We address a number of questions concerning labour reallocation as a determinant of labour market adjustment: What is the nature of job reallocation in transition countries? How is this related to transition probabilities between the different labour market states that face workers in these countries? To what extent does Macedonia fit with the general pattern of job reallocation in transition countries and how are the labour market flows associated with the persistent unemployment? How much does the private sector contribute to the absorption of unemployed workers and which categories of workers are most affected by a low probability of exiting unemployment? By analysing the labour market flows in transition countries and particularly in Macedonia, our aim is to determine the ability for adjustment of their labour markets as a prerequisite for building our model of the sustainable rate of unemployment.

This chapter is structured as follows. In section 3.2 we review the basic notions of labour market flows. In this context, we introduce the stock-flow model and transition matrix as appropriate tools and consider the characteristics of unemployment duration. Next, in section 3.3 we examine the labour market flows in transition countries by constructing a stylised picture of the two phases of transition and by presenting the relevant empirical evidence. In section 3.4 we pay our attention to the labour market flows in Macedonia in order to determine to what extent job reallocation and labour mobility resemble the identified patterns in the transitional world. Additionally, we decompose the worker flows by type of firm ownership and age groups. Finally, section 3.6 contains the main concluding remarks about labour market dynamics and provides directions for further analysis.

3.2 An introduction to labour market flows

3.2.1 The basic concepts

In the analysis of labour market flows we can distinguish between job and worker flows, each of which characterised by their own specificities. The former reflect the structural changes in the economy, whereas the latter mirror labour mobility. The usual measure of labour mobility is the labour turnover calculated as a

sum of hirings and separations during a one-year period. Dividing the sum of workers who are hired or separated by the average annual employment gives a rate of labour turnover. Hirings may be intended to fill a vacated jobs or new openings. Separations can be divided in two groups: voluntary (quits) and involuntary (lay-offs). The difference between hirings and separations gives the net change in employment.

The dynamics on the demand side of the labour market can be assessed by the job turnover which mirrors the processes of job creation and job destruction. Job creation consists of all employment gains from opening or expanding establishments, whereas job destruction consists of all employment losses from closing or contracting establishments. The job creation and job destruction rates can be calculated when the amount of job creation and job destruction are represented relative to the total number of jobs. In addition to these measures, we can calculate the gross job reallocation rate as a sum of job creation and job destruction rates and net employment growth rate as a difference between the job creation and job destruction rates. The gross job reallocation rate is also known as job turnover rate. Finally, a measure that captures the amount of job reallocation which is above the reallocation necessary to accommodate a given net employment growth rate is the excess job reallocation rate and is calculated as gross employment growth rate minus the absolute value of the net employment growth rate. The excess job reallocation rate is interpreted as a measure of the degree of enterprise restructuring, since it captures the fraction of all jobs that have shifted from contracting toward expanding establishments.

Job flows reveal primarily the changes on demand side of the labour market, whereas worker flows reflect simultaneously the dynamics of demand and supply sides (Davis et al., 2005). Labour turnover equals job turnover plus the movements into and out of ongoing jobs, also known as 'labour churning'. In some cases workers separate because jobs are terminated, but in other cases they move into and out of existing jobs because of poor matching or other factors such as leaving the labour force due to retirement. Therefore, the worker flows generally exceed, though in a hypothetical case they can be equal to the job flows. Given these differences in the information they contain, in our analysis we assess both the job and worker flows in transition countries and particularly in Macedonia.

3.2.2 Tools for the analysis of labour market flows

One of the useful tools for analysing workers transitions among the basic labour market states is the stock-flow model. The stock-flow model gives an insight into the number of workers who are employed, unemployed or out-of-labour force in the given reference period of the survey and the number of those who have changed status between two surveys. Thus, the stock-flow model allows an assessment of not only the cross sectional state of labour markets, but also the dynamics of transitions among the basic labour market categories. On the basis of the stocks and flows of workers, we can estimate a transition matrix, which contains the probabilities of transition among labour market states. For this purpose we use the following notation: 1 for employed, 2 for unemployed and 3 for out-of-labour force. Thus, there are nine possible transitions, described with transition matrix (3.1).

$$T = \begin{bmatrix} p_{11} & p_{12} & p_{13} \\ p_{21} & p_{22} & p_{23} \\ p_{31} & p_{32} & p_{33} \end{bmatrix} \quad \ldots (3.1)$$

The probability of a person moving from one to another state in the labour market is given by the expression (3.2).

$$p_{ij} = \frac{F_{ij}}{S_i} \quad \ldots (3.2)$$

where indices *i* and *j* take values 1, 2 and 3 which correspond to the labour market states described above.

F_{ij} represent flows *i.e.* the number of persons who moved from state *i* at time *t* into state *j* at time $t+1$;

S_i represent stocks, *i.e.* the initial number of persons in the state *i* at time *t*.

The elements p_{11}, p_{22} and p_{33} in (3.1) correspond to the probabilities of maintaining the same status, either employment, unemployment or out-of-labour force. In the context of employment, we can further distinguish those who have maintained the same jobs and, those who have changed their jobs, experiencing so-called job-to-job movements. In some cases the LFS design does not allow the capture of job-to-job movements, which is a source of underestimation of the labour force mobility.

Another limitation of using LFS data is the difficulty in assessing the degree of so-called 'round tripping'. 'Round tripping' is a situation where one person between two surveys moves from state *i* to state *j* and than turn back to the original state *i*. Because the survey registers only the state of the person at the beginning and in the end of the survey period, it is unable to cover the movements described above. Consequently, reported labour market flows are likely to be biased since they ignore these 'round tripping' movements. This shortcoming can be overcome by introducing questions in the standard LFS questionnaire that help to retrospectively document the labour market status of the respondent for the period between two surveys.

3.2.3 Unemployment duration

The labour market flows as described in the previous sections to some extent determine the characteristics of the labour markets. From the point of view of labour dynamics, we can distinguish two types of labour markets: dynamic and sclerotic (Blanchard, 1997). Highly dynamic labour markets are those, where most of the workers go through unemployment experiencing short spells while searching for a job. Sclerotic labour markets are those, where a considerable number of workers remains in the pool of unemployed for a long period of time. In both cases the overall unemployment rates can be equal, but the latter case is of more serious social concern because one group of workers remain without a wage income for long periods of time.

From the point of view of unemployment duration, as already discussed in Chapter 1 (section 1.4.3) we differentiate short-term from long-term unemployment. In the case of depressed labour markets such those observed in SEECs we additionally consider the very-long-term unemployment that comprises those who search for jobs more than four years. The workers who experience long-term unemployment over the course of time are likely to become weakly attached to the labour force and socially marginalised for a number of reasons. First, according to the human capital theory their skills become obsolete. Second, a long duration of unemployment creates adverse signalling effects to employers (OECD, 2002a). Third, according to search theory, the long-term unemployed manifest low search intensity (Blanchard and Diamond, 1992). Bearing in mind the above arguments we can conclude that long-term unemployed is characterised by the phenomenon of 'state dependence', which means that the longer a person is unemployed the harder it is for

him to quit the unemployment status for employment. Consequently, workers who experience long spells of unemployment can easily turn into the group of 'discouraged workers' who are detached from the work force. The long-term unemployed are not viewed by employers as attractive fillers of vacancies, meaning that their employability as defined in Chapter 2 is relatively weak. Therefore, the unemployment rate, which includes long-term unemployed with the same 'weight' as short-term unemployed, does not give an accurate image of labour market conditions.

Although the overall rate of unemployment is the most frequently used indicator of labour market conditions, its accuracy in the presence of significant number of 'discouraged workers' is questionable (Brown et al., 2006). The unemployment rate can be disaggregated for various groups of population and broken down into inflow and average duration of unemployment spells. One possible approach for overcoming the above-mentioned weakness is to use a duration weighted unemployment rate, where groups of workers with longer unemployment spells will be counted more heavily than those who experience shorter unemployment spells. Alternatively, advocates of the flow approach to labour markets rely on information drawn from probability of exiting unemployment instead of the unemployment rate itself (Blanchard and Diamond, 1992; Blanchard, 2006). With this in mind, we next turn to the analysis of the labour market flows in transition countries in order to assess their adjustment capacity to adverse economic shocks.

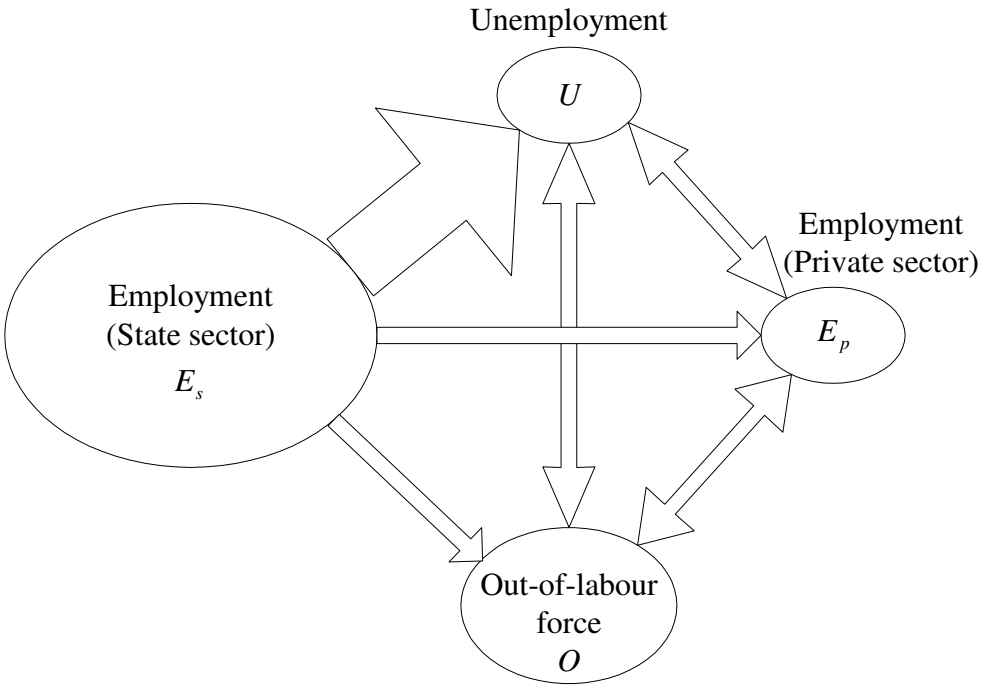
3.3 Labour market flows in transition countries

According to our general assessment of transitional process in Chapter 1 and the experience drawn from the OST models in Chapter 2, we can distinguish two phases of transition each of which characterised by its own specific pattern of labour market flows. In order to analyse the labour markets flows in transition countries using the stock-flow model, it is helpful to divide the employment category into employment in the state sector and employment in the private sector. This extended stock-flow model is more appropriate to apply in the case of transition because it allows an estimate of the growth of the private sector relative to the state sector. In what follows in this section we first present the main characteristics of the job reallocation in the two phases of transition, followed by the empirical assessment of the worker flows.

3.3.1 The first phase of transition

Almost all socialist economies, initially were suffering from huge labour hoarding and large state sector. During the initial transitional recession, real output sharply declined and the labour market started to adjust. As we have seen in Chapter 1 (section 1.2), open unemployment emerged in all transition countries, as they gradually adopted a market orientation. Rising unemployment was mostly due to the declining state sector where considerable number of workers was laid-off. Most of them were further trapped in unemployment primarily because of two reasons: (i) the skill mismatch between the skills they possessed and those required for the new jobs in the private sector and, (ii) insufficient job creation *i.e.* decrease in demand for labour (Svejnar, 2002b). There is a vast literature presenting evidence that job destruction in the state sector at the outset of transition was higher than the job creation that primarily took place in the private sector (e.g. Bojanec and Konings, 1999; Faggio and Konings, 2001; Cazes and Nesporova, 2003; Haltiwanger et al., 2003). However, the growth of the private sector in the first phase of transition was not strong enough to absorb the 'army' of unemployed. Consequently, the net change in employment growth during the initial phase of transition was negative in almost all transition countries. The stylised stock-flow model for the first phase of transition is depicted in Figure 3.1.

Figure 3.1 A stylised stock-flow model for the first phase of transition



The empirical findings concerning the extent of labour reallocation during the first phase of transition corroborate the above stylised picture. For instance, Blanchard (1997) by using stock-flow model presents a simplified two-sector adjustment of labour markets in Poland and Hungary during the early stage of transition (1992-1993). According to the above-presented general framework of transitional labour markets adjustment, it was confirmed that outflow rates from unemployment to employment were considerably lower than inflow rates to unemployment from employment. In his analysis, Blanchard gives the absolute numbers of workers instead of rates of flows across the labour market states. Comparing the inflows from the state and private sector we can conclude that in both cases the number of workers that have transferred from employment into unemployment is higher for the state sector than for the private sector in Poland (730,000 and 400,000 respectively) and Hungary (230,000 and 100,000 respectively).

Nevertheless, unemployment was not always a necessary 'transfer zone' through which workers from the declining state sector passed. For instance, a number of authors point out the importance of the direct flows of workers from state to private enterprises rather than from unemployment to the private sector (Jackman, 1994; Boeri, 2000). Though, the transfers of workers between state and private employment were not balanced. For example, Blanchard (1997) shows that the flow of workers from state into private employment in Hungary for the period 1992-1993 was 130,000 workers, while in the opposite direction, *i.e.* from private into state employment was just 30,000 workers. Job-to-job flows within the state sector accounted for 150,000 workers, while the corresponding number in the private sector was 70,000. Therefore, despite the increasing employment opportunities in the private sector, the workers mobility within the state sector during the first stage of transition was still relatively high.

In addition, Boeri and Terrell (2002) emphasise the relative importance of voluntary quits over lay-offs as a contributing factor to the rising unemployment in transition countries. Similarly, Cazes and Nesporova (2003) analyse separations distinguishing between terminations by employers (redundancy) and separation for other reasons including voluntary quits. In almost all transition countries the voluntary quits and other reasons for separation are higher than the terminations by employers throughout the whole period of transition. This tendency is more present in the CIS countries than in the CEECs and Baltics, since in the former group of

countries firms retained their paternalistic attitudes towards their workers. However, we should be careful in assessing these differences because employers may agree with redundant workers on early retirement or other forms of quasi-voluntary quits. This solution may be acceptable for both sides *i.e.* for employers being less costly, while giving to workers various opportunities to benefit from alternative social transfers.

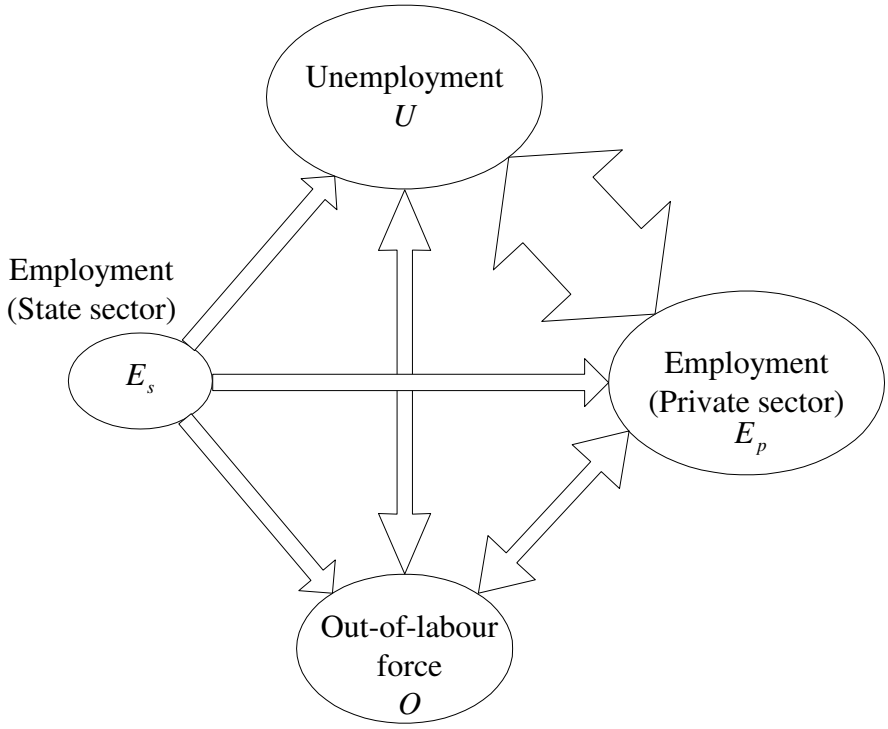
Most of the researchers' attention during transition has been attracted by the process of labour reallocation between sectors (e.g. Jurajda and Terrell, 2002; Raiser et al., 2003). According to the stylised facts, the bulk of labour reallocation occurred between declining industry and agriculture on one side and a growing sector of services on the other side. However, empirical evidence about the extent of labour reallocation among the sectors during the first phase of transition is not unanimous. Some authors find a significant labour movement into finance, trade and tourism sector and out of the agricultural and industrial sectors, which contributed to a convergence of transition economies toward sectoral structure of employment typical for mature market economies (Sorm and Terrell, 2000; Gottvald, 2001; Masso et al., 2005). In contrast, other group of authors found that labour movements mainly consisted of within-industry reallocation (Faggio and Konings, 2001; Jurajda and Terrell, 2003; Haltiwanger et al., 2003). According to our findings in Chapter 1 (section 1.4.2), the less successful transition countries such as SEECs experienced a different pattern of labour reallocation characterised by an increase in employment in agricultural sector and low productivity services.

3.3.2 The second phase of transition

The second phase of transition, when the major restructuring process of the state sector finished, is represented by a so-called 'balanced path' (Blanchard, 1997). In this phase of transition as the state sector had contracted, the flows of workers from this sector into private sector, as well as into unemployment due to involuntary layoffs, have diminished. Consequently, the main driving force of labour force adjustment in the second phase of transition is the private sector where the major entrants into new employment come from the pool of the unemployed. The growing employment opportunities in the private sector helped unemployment rates in the advanced transition countries to gradually converge toward the OECD average. In

contrast to the initial phase of transition, the empirical findings in the mature phase show that job creation and job destruction are simultaneous processes, with a relatively modest net employment change (Faggio and Konings, 2001; Masso et al., 2005). The stylised stock-flow model for the second phase of transition is illustrated in Figure 3.2.

Figure 3.2 A stylised stock-flow model for the second phase of transition



However, the above described pattern has not been common in those transition countries that were lagging behind in the restructuring process (Faggio and Konings, 2001). The labour markets in these countries even in the later phase of transition manifest depressed characteristics where job destruction remains higher than job creation. Long-term unemployment has gradually built up, thus causing human capital depreciation and a decline in the average search effort. Therefore we can expect that in these circumstances various forms of non-standard employment such as subsistence agriculture and other labour market adjustment mechanisms have partially replaced the role of formal job creation and reduced the social consequences of high and persistent unemployment. The difference in job reallocation patterns between selected transition countries is illustrated in Table 3.1. Due to the lack of one consistent source of data for aggregate job flows, we use a number of different sources. In addition, in the lower panel of Table 3.1 we present the job flow rates for

some developed OECD countries that are used as a reference for making international comparisons.

Table 3.1 Aggregate job flow rates in selected transition countries (percent)

Country	Job creation rate	Job destruction rate	Gross job reallocation rate	Net employment growth rate	Excess job reallocation rate
Estonia (1994-1997)[a]	7.9	8.1	16.0	-0.2	15.8
Poland (1993-1999)[b]	8.4	9.1	17.5	-0.7	16.8
Slovenia (1994-1997)[a]	4.3	5.2	9.5	-0.9	8.6
Bulgaria (2000)[c]	6.8	10.8	17.6	-4.1	13.5
Moldova (2001) [c]	6.7	11.2	17.8	-4.5	13.3
Ukraine (1999-2000)[d]	4.3	9.5	13.8	-5.2	8.6
International comparison					
France (1984-1991)[e]	12.7	11.8	22.4	0.9	21.5
Germany (1983-1990)[e]	9.0	7.5	16.5	1.5	15.0
UK (1985-1991)[e]	8.7	6.6	15.3	2.1	13.2
US (1984-1991)[e]	13.0	10.4	23.4	2.6	20.8

Sources: [a] *Faggio and Konings (2001);* [b] *Rutkowski (2002);* [c] *Rutkowski (2004);* [d] *Konings et al. (2003);* [e] *OECD Employment Outlook, 1996.*

From Table 3.1 we observe that advanced transition countries such as Estonia, Poland and Slovenia had by the mid 90's, already entered a 'balanced path' where job creation and job destruction are parallel processes in the similar range. Even though these countries experienced a small negative employment growth rates, the characteristics of their labour reallocation are closer to those observed for developed OECD countries rather than to those found in less developed transition countries. Moreover, Estonia and Poland during the assessed periods experienced the highest excess job reallocation rates which indicate their significant structural reallocation of labour from low productivity towards high productivity jobs. In this context, other empirical findings show that private, smaller as well as foreign enterprises accounted for the majority of the labour turnover (Faggio and Konings, 2001; Rutkowski, 2002; Masso et al., 2005). Additionally, the encouragement and development of entrepreneurship has been identified as a highly-rewarding strategy that can significantly contribute to labour reallocation in advanced transition countries (Dutz et al., 2001).

In contrast, the less developed transition countries such as Bulgaria, Moldova and Ukraine a decade after the start of transition still experienced significant negative

employment growth, which indicates that their economies were lagging behind in the restructuring process (Konings et al., 2003). Among these countries we also notice high gross job reallocation rates, which are due to the high job destruction rates relative to the job creation rates, whereas the excess job reallocation rate in average is lower than that observed in advanced transition countries. Moreover, entrepreneurship in less developed transition countries has been little developed due to various barriers to entry manifested in the complex procedures for starting businesses (Kose and Karadeniz, 2004). Additionally, it is worth noting that the entrepreneurship in these countries operated mostly as a coping strategy thus, providing the basic needs for majority of their citizens (Dutz et al., 2001). In sum, the second phase of transition has been characterised by more diversity amongst transition countries with respect to their labour market outcomes. The more advanced transition countries have managed to create a relatively large number of new jobs in the private sector and achieved a fairly high employment growth. In contrast, the less successful transition countries have failed to boost their private sector growth and continued to experience a significant decline in employment.

3.3.3 Empirical evidence on worker flows in transition countries

The labour market dynamics in transition countries will be further assessed by analysing the worker flows between the basic labour market states. For this purpose we use LFS data, usually provided on an annual basis and we contrast the gross worker flows with the main job reallocation patterns identified in the previous sections. Gross workers flow rates for selected transition countries are presented in Table 3.2. For convenience we denote the flows between any two labour market states by using their first letters (For example, EU designates the flow rate from employment to unemployment, EO stands for the flow rate from employment to out-of-labour force and so forth). The first six columns of Table 3.2 show the probabilities of transition among the basic labour market states, while the LFS unemployment rate in corresponding transition countries is given in the last column. The last row shows the gross flows rates between 1992 and 1993 for the United States, serving as reference point for assessing the degree of labour dynamics in transition countries.

Table 3.2 Gross annual workers flow rates for selected transition countries (percent)

Country	EU	EO	UE	UO	OE	OU	LFS U
Bulgaria (1994-1995)	5.9	9.2	32.3	24.4	5.5	4.4	20.0
Czech Rep. (1994-1995)	1.3	2.8	49.6	12.9	4.2	1.2	4.3
Czech Rep. (1995-1996)	1.0	5.6	47.1	15.6	6.7	0.4	4.0
Czech Rep. (1998-1999)	1.8	2.5	33.5	9.0	3.6	1.7	6.5
Poland (1992-1993)	4.0	7.6	36.1	15.8	9.5	4.5	12.9
Poland (1993-1994)	4.0	6.3	35.4	15.9	7.4	4.3	14.0
Poland (1994-1995)	3.5	5.5	38.0	15.6	6.0	3.2	14.4
Russia (1995-1996)	3.4	7.2	39.9	32.8	10.9	6.4	8.9
Slovakia (1994-1995)	2.3	4.5	23.7	7.8	1.8	1.7	13.7
Slovakia (1995-1996)	2.9	2.7	34.8	4.2	2.0	1.6	13.1
Slovenia (1994-1995)	2.4	5.8	38.7	19.4	6.3	2.1	9.1
US (1992-1993)	2.8	5.3	65.9	28.8	4.3	16.1	7.5

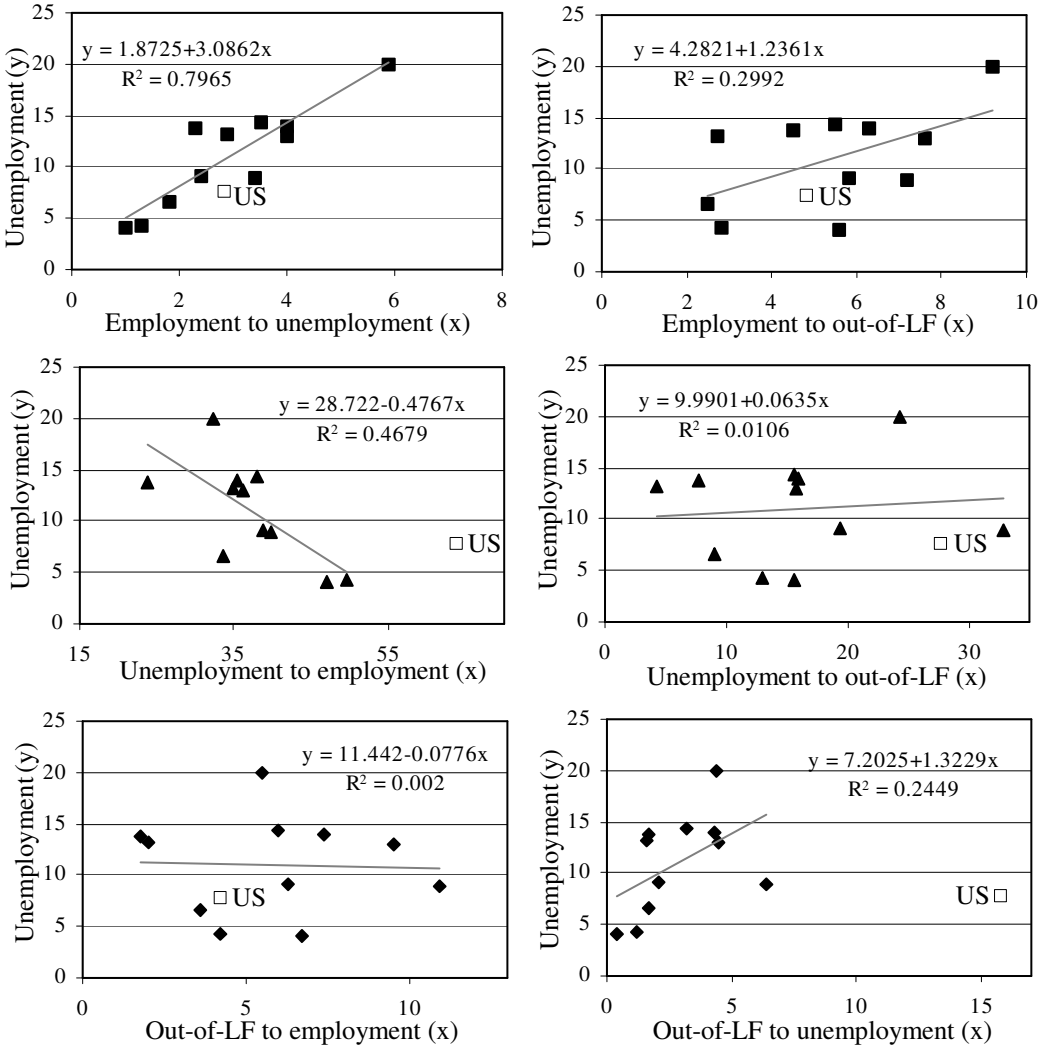
Source: Boeri and Terrell (2002); ILO, LABORSTA database

According to Table 3.2, the highest inflow rate to unemployment from employment is in Bulgaria, while the lowest rates are registered in the Czech Republic. Compared to the US, it is clear that inflow rates to unemployment from employment in most of these transition countries are only slightly higher, whereas in the Czech Republic and Slovenia these rates are actually lower. Moreover, the dynamics of the inflow rate in the Czech Republic shows that as inflow rate to unemployment increased in the later stage of transition (1998-99), the unemployment rate also increased (Gottvald, 2001). In contrast, the outflow rates from unemployment to employment are considerably lower than the corresponding rate for the US which constitutes an important cause of unemployment persistence in these transition countries. The outflow rates from unemployment to employment among the transition countries are highest for the Czech Republic, while the lowest rates are registered in Slovakia and Bulgaria.

From the above, we can conclude that the key generator of the stagnant pool of unemployment in transition countries is not the high inflow rates from employment to unemployment, but rather the low outflow rates from unemployment to employment. Thus, the low probabilities of exiting unemployment induce long spells of unemployment, which implies an increasing share of long-term unemployment. In this context, it is worth mentioning that the data in Table 3.2 mostly cover the period 1994-1996, when the restructuring process in advanced transition countries was largely completed. Consequently, we assume that inflows to unemployment from

employment in this phase of transition are more likely to be result of voluntary quits rather than involuntary lay-offs of workers in the state firms. In order to obtain a more accurate picture of the nature of the labour markets flows in transition countries and their implications on the unemployment rate, in Figure 3.3 we present scatter plots of flow rates against the unemployment rates.

Figure 3.3 Scatter plots of unemployment rate vs. flow rates in selected transition countries



Source: data from Table 3.2

According to Figure 3.3, the direct flows from employment to unemployment and vice-versa in selected transition countries clearly show a strong association with the unemployment rate. The remaining flows although manifesting a less consistent pattern reveal valuable information that we further discuss. The flow rates from employment to out-of-labour force are relatively high in Bulgaria, Russia and Poland, but low in the Czech Republic and Slovakia compared to the corresponding rate for

the US. In line with this, some authors have documented that the flow rates to inactivity have exceeded the flow rates to unemployment in almost all transition countries (Cazes and Nesporova, 2003). The pattern of high flow rates from employment to out-of-labour force reflects the poor demand condition for labour, but also, the relatively generous eligibility criteria for early retirement and access to disability pensions during the first phase of transition (Cavalcanti, 2001). With respect to the flows from unemployment to out-of-labour force and flows from out-of-labour force to employment, although on average similar to those estimated for US, we cannot establish consistent pattern.

In contrast, considering the flow rates from out-of-labour force to unemployment in Figure 3.3 it is clear that all these selected transition countries have lower rates than the US. Therefore, facing poor employment prospects, potential new entrants or re-entrants are more likely to decide to stay out-of-labour force than to enter the pool of unemployed. In our view, the low flow rates from out-of-labour force to unemployment are caused by depressed labour market conditions, already detected by the low outflow rate from unemployment to employment and might be an indicator of an increased number of 'discouraged workers'. This raises the question of the importance of non-participation as a form of labour market adjustment that will be examined in Chapter 5.

A number of authors have attempted to disentangle the driving forces behind these labour market flows in transition countries by decomposing them with respect to various socio-demographic characteristics of workers that moved across labour market states (Gimpelson and Lippoldt, 2000; Gottvald, 2001; Dutz et al., 2001). According to these studies, we can draw several useful conclusions. First, age is an important factor for labour force mobility, younger workers are much more mobile than the older groups of workers. Second, the gender analyses showed marked asymmetry in labour mobility with men being more likely to go into unemployment, while women being more likely to leave the labour force. Third, higher educational attainment was revealed as a contributing factor to the ability to maintain employment status. Finally, considering mobility with respect to the occupational characteristics of the workers, the highest probability of staying in employment was found among professionals, while the lowest was among agricultural workers and those in elementary occupations.

3.4 Labour market flows in Macedonia

After examining the labour market flows in transition countries, in this section we turn to an analysis of Macedonian labour market dynamics. As elaborated in Chapter 1 (section 1.3.2), Macedonia during transition experienced a so-called U-shaped trend in the evolution of GDP and industrial production. The share of employment in the private sector increased rapidly from one third in 1996 to almost two thirds of total employment in 2005, thus confirming its important role in the economy. Moreover, we have revealed that despite the positive growth trend in the second phase of transition, Macedonia is one of the few transition countries that have still not reached the pre-transitional level of GDP (Chapter 1).

3.4.1 Analysis of Macedonian aggregate job flows

Even though Macedonia has experienced deep and sustained economic recession with far reaching consequences, the subject of labour demand has so far not attracted much research attention. One possible reason for this gap in the literature is the scarcity of data sources for job turnover, though the gross job flows for the first decade of transition have been already documented (Micevska and Eftimoski, 2003). Given the lack of previous research, we re-examine the period 1992-1999, as presented in Table 3.3, and provide new insights regarding the job reallocation for this period.

Table 3.3 Aggregate annual job flow rates in Macedonia (percent)

Year	Job creation rate	Job destruction rate	Gross job reallocation rate	Net employment growth rate	Excess job reallocation rate
1992	2.0	7.4	9.4	-5.4	4.0
1994	2.3	13.4	15.7	-11.1	4.6
1995	0.9	9.1	10.0	-8.2	1.8
1996	1.4	7.4	8.8	-6.0	2.8
1997	1.1	11.4	12.5	-10.3	2.2
1998	3.0	9.9	12.9	-6.9	6.0
1999	2.4	4.9	7.3	-2.5	4.8
Average	**1.9**	**9.1**	**10.9**	**-7.2**	**3.7**

Source: Micevska and Eftimoski (2003) and, authors' calculations

By carefully examining the data presented in Table 3.3 and comparing with the general characteristics of job reallocation in transition countries observed in Table

3.1, we can draw several conclusions. First, we notice that the job destruction rate in Macedonia was higher than the job creation rate over the whole first decade of transition. Second, the volatility of job destruction rate is high ranging from 4.9 to 13.4 percent, compared to the volatility of job creation rate ranging from 0.9 to 3 percent. Third, the gross job reallocation rate is high due to the high job destruction rate that accounts on average for 83 percent of the total job turnover. Fourth, the excess job reallocation rate is low by international standards, which suggests that the Macedonian economy did not undergo substantial restructuring during the first decade of transition. Taking into account the above findings, we conclude that observed job reallocation in Macedonia during the first phase of transition is close to that experienced in other less developed transition countries and, fits well within the elaborated stylised pattern specific for a 'lagging reformer'. The already mentioned lack of individual data on job creation and job destruction restrains us from performing a more detailed analysis of variations in job turnover according to various employer characteristics such as industry, ownership, firm size and so forth.

We further put the above findings within a macroeconomic context and attempt to draw a relationship between the dynamics in labour reallocation and GDP growth, as elaborated in Chapter 1. The negative net employment growth rate in the first phase of transition is consistent with the observed output decline. The subsequent upturn in GDP growth since 1996 was not accompanied by positive net employment growth rates, which without full accounting for employment in the informal sector suggested 'jobless growth' and rising aggregate productivity (Chapter 1, section 1.3.2). Therefore, the relative increase in the private employment as share of total employment is due more to the rapid downsizing of the state sector rather than outstanding growth of the private sector. The stagnant pool of unemployment in the second phase of transition put under question the absorption capacity of the private sector, thus suggesting increased importance of alternative labour market adjustment mechanisms. However, as argued in Chapter 1, the aggregate data do not account for the job reallocation in the informal sector implying that above argument about rising productivity may not hold when GDP growth is related to the total employment growth including both the formal and informal sector.

3.4.2 Analysis of Macedonian gross worker flows

We next turn to an analysis of worker flows in Macedonia in order to represent simultaneously the reallocation of jobs on the demand side and labour mobility on the supply side. In order to assess worker flows in Macedonia we estimate the transition probabilities among the basic labour market states for the periods 2001-02 and 2002-03 by using LFS data (Table 3.4). Since these data were not previously published in the official LFS publications, after negotiation we were provided them by the Macedonian Statistical Office and, to our knowledge, this is first documented analysis of the worker flows in Macedonia.

Table 3.4 Gross annual worker flow rates in Macedonia (percent)

Period	EU	EO	UE	UO	OE	OU	LFS U	Labour turnover
2001-2002	4.92	6.20	10.88	18.94	1.90	3.27	31.9	19.67
2002-2003	5.80	5.23	9.76	16.82	1.86	3.82	36.7	19.88

Source: Macedonian Statistical Office, authors' calculations

By comparing the gross annual worker flow rates between the two periods of consideration we can observe an increase in the inflow rates to unemployment from employment and to unemployment from out-of-labour force. Moreover, these changes were associated with a decrease in the outflow rates from unemployment to employment and from unemployment to out-of-labour force. Taken together the worker flows between 2001 and 2003 had a deteriorating effect on the overall labour market conditions manifested in the rising unemployment rate from 31.9 to 36.7 percent. However, the labour turnover rate over the same period increased only slightly from 19.67 to 19.88 percent showing no substantive changes in overall labour mobility.

The Macedonian worker flows presented in Table 3.4 correspond to a later phase of transition compared to the data provided for other transition countries, covering mostly the mid 90's in Table 3.2. Although this time distance is significant, we can still make comparative analysis assuming that Macedonia is lagging behind the more advanced transition countries in the process of transition. Comparing the gross worker flows in Macedonia with those in other transition countries we observe that the inflow rates to unemployment from employment are among the highest, while the flow rates from employment to out-of-labour force are in the range observed for other transition countries. The high inflow rates to unemployment from employment

in the later phase of transition indicate that the process of transitional restructuring is still not complete.

Furthermore, we observe that the Macedonian outflow rates from unemployment to employment are among the lowest, while the flow rates from unemployment to out-of-labour force are in the range observed for other transition countries. In this context, the probability of an unemployed person quitting the unemployment pool to transfer into non-participation is nearly twice as high as their probability of moving into employment. This finding is in contrast to the situation observed in other transition countries in Table 3.2. Facing poor employment possibilities in the labour market, the Macedonian unemployed are more likely to stay in the unemployment pool or to become discouraged workers. Moreover, higher flows from unemployment to out-of-labour force might be a sign of the presence of various labour market adjustment mechanisms that substitute for the role of the private sector as generator of employment.

Finally, the flow rates from out-of-labour force to employment are relatively low, while the flow rates from out-of-labour force to unemployment are in the range observed for other transition countries. As we can see from Table 3.4, the probability of becoming unemployed amongst those entering the labour force is twice the probability of obtaining a job. This finding is at odds with situation in other transition countries, where entrants' probability of becoming employed is higher than their probability of becoming unemployed (Table 3.2). According to the findings in Chapter 1 we can further argue that transfers from out-of-labour force into the labour force in depressed labour markets might be partly induced by the passive labour market policies such as generous entitlements to those who register as unemployed.

3.4.3 Decomposition of Macedonian worker flows by type of firm ownership

Given the generally observed patterns of labour reallocation in transition countries we expect more intensive worker flows from unemployment to private employment rather than to other types of ownership. By disaggregating employment according to the type of ownership *i.e.* employment in the private sector and employment in other sectors[23] we can obtain the more detailed transition matrix represented in Table 3.5.

[23] This category consists of social, mixed, collective and state ownership.

Table 3.5 Decomposition of Macedonian worker flows by type of ownership (percent)

	Employed private 2003	Employed other 2003	Unemployed 2003	Out-of-labour force 2003
Employed private 2002	86.15	3.63	5.77	4.44
Employed other 2002	2.58	85.50	5.84	6.08
Unemployed 2002	7.79	1.98	73.42	16.82
Out-of-labour force 2002	1.41	0.46	3.82	94.32

Source: Macedonian Statistical Office, authors' calculations

From Table 3.5 we can see that the difference between inflow rates from private employment and employment in other types of ownership to unemployment is negligible. In contrast, the outflow rate from unemployment to private employment is approximately four times higher than the outflow rate from unemployment to employment in other types of ownership. This confirms our expectation that the private sector dominates other types of ownership as generator of employment primarily from the pool of unemployed. In support of this conclusion the flow rate from out-of-labour force to private employment is about three times higher than the flow rate from out-of-labour force to employment in other types of ownership. Finally, the direct flows between the two employment sectors show that the flow rate from private employment to employment in other types of ownership is slightly higher than the flow rate the other way around. Having in mind that in 2003 the predominant type of employment is that in the private sector, we can assume that as privatisation has slowed down it has caused a slowing of the direct flow of workers from the state to the private sector.

Comparing the probabilities of staying in the same status, we can conclude that the highest is the probability of remaining out-of-labour force, then staying employed and finally, remaining unemployed. The relatively low probability of staying unemployed is mostly due to the higher flow rate from unemployment to out-of-labour force rather than from unemployment to employment. This suggests that any analysis of the pattern of the duration of unemployment should recognise this significant outflow to inactivity. The probability of remaining in private employment is slightly higher than that of remaining in employment in other types of ownership. Because only part of this latter group is employment in the state sector, it is not possible to draw clear conclusions whether employment in state sector is more secure than employment in the private sector. The design of the Macedonian LFS, like the surveys in many other transition countries, prevents any assessment of job-to-job

movements within the sector as well as round tripping movements of the labour force. Supposing that the extent of these movements is significant, the calculated probabilities of labour force mobility presented in the tables above underestimate the actual mobility in the Macedonian labour force.

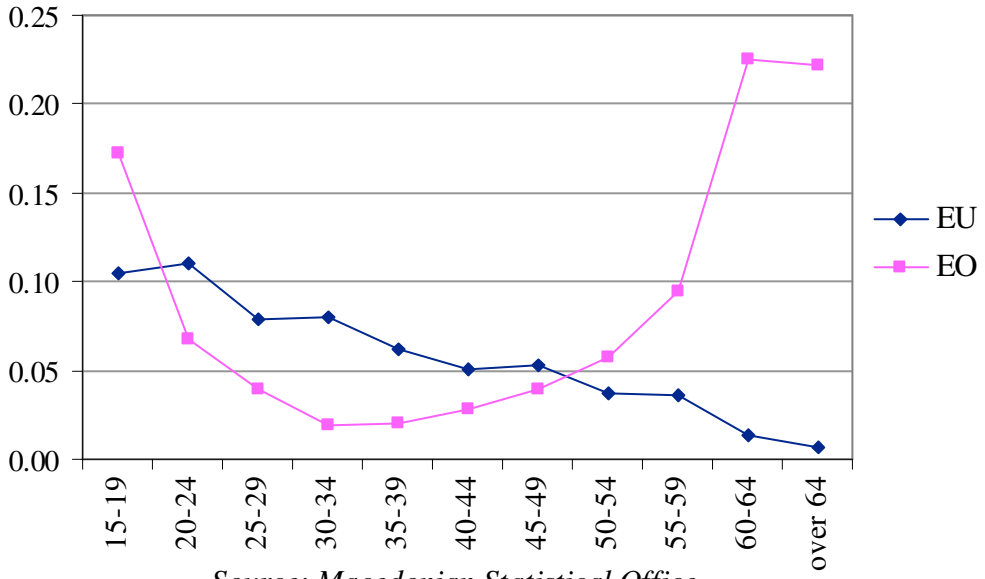
3.4.4 Decomposition of Macedonian worker flows by age

For a more detailed assessment of the Macedonian worker flows we further disaggregate the gross worker flows by age groups. According to orthodox theory, younger workers experience much higher mobility compared to more experienced workers because of their higher incidence of being laid-off, and also their higher propensity to voluntarily quit. The most likely reason for this difference in mobility is the different level of firm-specific human capital that workers acquire throughout their working life and the different quality of matches (Lazear, 2003). Since firms systematically invest in their workers' human capital, which is to some extent idiosyncratic for a given firm, they are reluctant to lay-off more experienced workers in periods of downturns. The adoption of deferred payment schemes is a second reason that favours a higher mobility amongst younger workers. According to these schemes, younger and inexperienced workers are underpaid relative to their marginal productivity, and overpaid when they are older and more experienced (Prendergast, 1999). Thus, incentives for voluntary quits are much higher among younger than among older workers. In addition, due to the differences in family responsibilities younger workers are geographically and occupationally more mobile compared to the senior workers.

If we compare the flow rates from employment for different age groups for the period 2002-03 (Figure 3.4), we can see that inflow rates to unemployment from employment are highest for the younger group of workers (aged 15-24) and this rate decreases with age. Thus, the observed high overall inflow rate to unemployment from employment is partly due to the higher inflow rate of young workers. The flow rates from employment to out-of-labour force by age groups manifest a U-shaped distribution, which means that younger and older groups of workers face a higher probability of becoming non-participants than prime age workers. Consequently, the empirical evidence confirms the previous theoretical assumption that even in stagnant labour markets, such as in Macedonia, the incidence of younger workers becoming

unemployed is higher than that of older workers. Additionally, we can partly attribute the high unemployment rate among Macedonian youth observed in Chapter 1 (section 1.4.3) to their high flow rate from employment to unemployment.

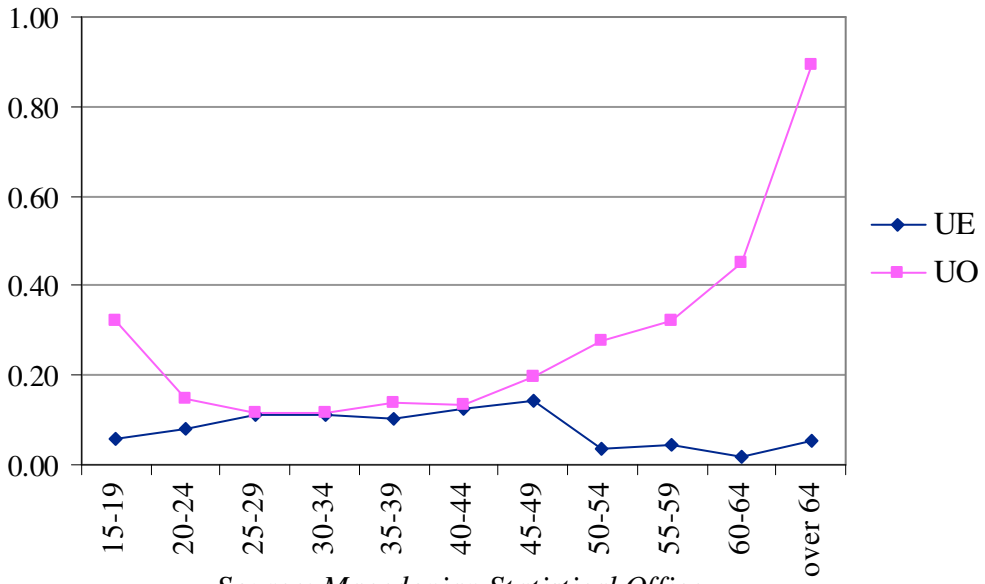
Figure 3.4 Flow rates from employment by age groups in Macedonia



Source: Macedonian Statistical Office

The low outflow rates from unemployment to employment do not vary much across age groups (Figure 3.5), though it is lower for the more elderly workers. The outflow rates from unemployment to out-of-labour force have a U-shaped distribution indicating that unemployed on both tails of the age distribution (younger workers between 15 and 24 and older workers above 45) face a higher incidence of transferring to out-of-labour force than becoming employed. The higher proportion of young unemployed that give up searching for jobs may be attributed to increasing trend of enrolment in higher education, whereas older unemployed may exit labour force in order to benefit from the social transfers for inactivity. The determinants of inactivity as alternative labour market adjustment mechanism will be reconsidered in details in Chapter 5. In contrast, prime age unemployed workers (aged 25-44) experience approximately the same probability of becoming employed or transferring to non-participation. According to these findings, it is clear that due to the younger workers and those who are close to the retirement age, the overall outflow rate from unemployment to out-of-labour force is approximately twice as high as the outflow rate from unemployment to employment.

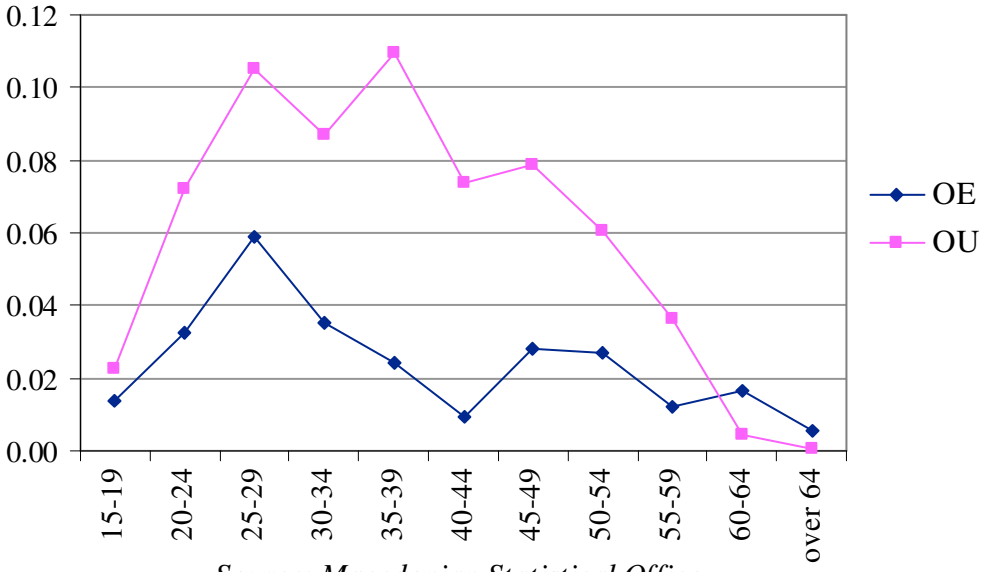
Figure 3.5 Flow rates from unemployment by age groups in Macedonia



Source: Macedonian Statistical Office

The flow rates from out-of-labour force to unemployment are higher than the flow rates from out-of-labour force to employment for all groups except the workers above 60 for whom both rates are very low (Figure 3.6). This gap is small for the group of the youngest workers, becomes wider for prime age groups of workers and decreases again for older groups of workers. The inflow rate to unemployment from out-of-labour force is low for younger groups of workers (aged 15-24), but increases sharply for subsequent age groups (aged 25-39) and than decreases gradually for older groups of workers. Similar to the previous elaboration, the lower inflow rate to unemployment from out-of-labour force among young workers can be partly attributed to the postponement of labour force participation due to the post-compulsory education (Chapter 1, section 1.4.1). The flow rates from out-of-labour force to employment are lower, but manifest a similar distribution as the flow rates from out-of-labour force to unemployment. The highest flow rate from out-of-labour force to employment is that of young workers (aged 25-29), whereas it decreases for the prime age and older group of workers. The gap between these two flow rates is largest for the group of workers 35-39, who are more than four times more likely to enter the labour force as unemployed rather than as employed.

Figure 3.6 Flow rates from out-of-labour force by age groups in Macedonia



Source: Macedonian Statistical Office

In sum, the results of this analysis of worker flows by age confirm the assumption of an uneven distribution of the incidence of becoming unemployed or staying out-of-labour force. Particularly the younger groups of workers face a higher probability of becoming unemployed or remaining out of labour force by postponing their entrance into the labour market. Overall this suggests that poor employment prospects are the main reasons for the observed state dependence phenomenon in the Macedonian labour market, which is particularly pronounced among young workers. At this point, we should add that limited accessibility to individual data from the Macedonian LFS deprived us from carrying out more complex analysis of worker flows with respect to various social and demographic characteristics such as gender, level of education, profession or ethnic background.

3.5 Conclusion

Labour market flows, both job and worker flows represent important indicators of labour market dynamics, particularly in transition countries. Bearing in mind the systemic changes during transition it was initially common to assume that labour markets in transition countries would be highly dynamic. The first phase of transition was characterised by a sharp decline in state sector employment, with a large number of workers being laid-off. However, in the second phase transition countries have manifested two different reallocation patterns. In the more advanced

countries the expanding private sector has taken on the role of the main job generator leading to a decrease in unemployment rates, whereas in the less developed transition countries job destruction in the state sector still dominates job creation in the private sector. The empirical evidence from analyses of worker flows shows that unemployment rates in transition countries predominately reflect inflows to unemployment from employment and outflows from unemployment to employment. The reason for the stagnant unemployment pool currently observed in many less developed transition countries is the low outflow rate from unemployment to employment, rather than a high inflow rate from employment to unemployment. Furthermore, the depressed conditions of transitional labour markets has led to another observable feature *i.e.* the relative unattractiveness of searching whilst unemployment manifested in the low inflow rates from out-of-labour force to unemployment.

From the analysis of labour market flows in Macedonia we draw two main conclusions. First, the aggregate job flows in Macedonia during the first phase of transition reflect characteristics of a 'lagging reformer' with job destruction being higher than job creation. In this context, we identify poor employment conditions on the demand side as a main reason for persistent unemployment. Second, from the analysis of the worker flows, we conclude that the Macedonian labour market exhibits the characteristics of a sclerotic rather than dynamic labour market. Macedonian outflow rates from unemployment are among the lowest in transition countries representing a 'bottleneck' which causes high incidence of long-term unemployment.

By decomposing the worker flows we found that the probability of exiting unemployment is unevenly distributed across different age groups of workers. With respect to the type of firm ownership, we conclude that employment in the Macedonian private sector is more vibrant relative to employment in other types of ownership. Although the above pattern in worker flows led to an increase in the relative share of private employment, we argue that labour demand in Macedonia is still weak implying a relative importance of alternative labour market adjustment mechanisms such as employment in the informal sector, non-participation and emigration. The assessment of their impact on the unemployment in SEECs and particularly Macedonia will be the subject of our analyses in the next three chapters.

CHAPTER 4

EMPLOYMENT IN THE MACEDONIAN INFORMAL SECTOR

4.1 Introduction

In the previous chapters we have assessed the main characteristics of transition labour markets, paying special attention to SEECs and particularly Macedonia. Our analysis revealed that SEECs are characterised by depressed labour markets with prevailing high rates of long-term unemployment. Moreover, we have identified the presence of specific labour market phenomena such as labour force segmentation, increased number of discouraged workers, and low outflow rates from unemployment. Since job creation in the formal sector has not significantly improved during the whole period of transition, alternative labour market adjustment mechanisms in SEECs have an important role as absorbers of the negative effects of transitional recession on labour markets. In this chapter we will explore employment in the informal sector as a form of labour market adjustment in order to identify the extent of its absorptive capacity in SEECs and particularly Macedonia. The results of

this analysis together with other building blocks will be used as a basis for modelling the sustainable rate of unemployment in Chapter 7.

The informal sector in transition countries has developed in a unique manner and has taken specific forms that differ from those observed in the rest of the world. Thus, at the outset of our analysis we address a number of questions concerning the informal sector and its role during transition. What kind of economic activities does the informal sector consist of? Which of these is the most important for transition countries? How can we measure the size of the informal sector and particularly the fraction of the labour force which is involved in these types of activities? Which factors in transition countries are the most important in generating high shares of informal economy? Finally, what is the size and structure of the Macedonian informal sector and how can we estimate its impact on labour market adjustment?

In order to answer the above questions and explore the informal sector in transition countries and particularly Macedonia, we pursue the following structure in this chapter. In section 4.2 we establish the theoretical background which includes definition, types, causes, measurement and consequences of informal economic activities. In this context, we also evaluate the appropriateness of the LFS as a source of information on the informal sector. The empirical evidence on the informal sector in transition countries is presented in section 4.3. In this section we analyse measurement issues, the main characteristics and determinants of the informal employment as well as its relationship with unemployment. In section 4.4 we investigate the Macedonian informal sector first, by presenting some macro-estimates and than by examining the structure of population involved in such types of economic activities. Finally, in section 4.5 we present our concluding remarks.

4.2 Theoretical background

Since the introduction of the term ‘informal sector’ by Hart in 1971, this phenomenon has been the subject of various research efforts among academics and policymakers. All of them have intended to demystify various aspects related to causes, size and consequences of the informal sector. The controversial character of the informal sector is partly a result of different approaches taken to its definition, measurement, and policy treatment (Schneider and Enste, 2000). In what follows in this section we attempt to analyse the theoretical aspects of the phenomenon of

informal employment in order to prepare a ground for its comprehensive assessment in the context of transition countries and more specifically in Macedonia.

4.2.1 Definition of informal sector

Having in mind the multitude of different approaches, defining the informal economy is not a simple task. There are various terms that are used in order to denote the informal sector such as: informal, hidden, underground, parallel, black, unofficial, unrecorded, shadow, grey, dual, and so forth. Despite existing nuances in the meaning of the above terms, we will assume that more or less they concern the same issue.[24] However, in this analysis, for convenience we adopt the term 'informal' as the most appropriate and frequently used in the case of transition economies, because it indicates its specific nature in providing employment and alleviating poverty (Falcetti et al., 2003).

The difficulties in defining the informal sector of the economy, as pointed out by Bernabe (2002), arise because of different types of units of consideration, as well as because of different criteria that are used in the identification of informal economic activities. For example, as a unit of observation we can consider an enterprise, activity, people or income. Similarly, there are various criteria that are used in the identification of informal economy such as measurement, taxation or regulation. Therefore, the informal sector of the economy refers to output from enterprises, activities, people or income that are unmeasured, untaxed or unregulated.

Generally, as summarised by Fleming et al. (2000), there are two distinct approaches to the formulation of the informal sector. The first is called 'definitional' and considers the informal economy as unrecorded economic activity. The second approach, called 'behavioural', considers the informal economy as an explicit change in the behaviour of economic agents in response to institutional constraints. According to the most commonly used definition, the informal economy encompasses all unregistered economic activities that contribute to officially calculated or observed Gross National Product (Schneider and Enste, 2000; Schneider, 2002; Schneider and Klinglmair, 2004). Recently, Schneider (2005) has formulated the informal sector as

[24] For example, Eilat and Zinnes (2000) point out that term 'informal' tends to refer to artisanal and small-scale activities, 'hidden' and 'underground' are associated with tax evasion, 'parallel' and 'black' seem to be associated with currency dealing, whereas 'unofficial' and 'unrecorded' mostly refer to economic activities that escape national statistics.

marked-based legal production of goods and services that are deliberately concealed from the public authorities for the following reasons: (i) to avoid payment of income, value-added or other taxes, (ii) to avoid payment of social security contribution, (iii) to avoid having to meet certain legal labour market standards, such as minimum wage, maximum working hours, safety standards etc. and, (iv) to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms.

4.2.2 Types of economic activities within the informal sector

The informal sector of the economy is not homogenous and, it consists of various different types of activities. By using several criteria we can distinguish four types of economic activities within the informal sector: illegal, underground, informal and household activities (OECD, 2002b). In this context, we should make a distinction between the informal sector which designates all types of informality and informal economic activities as a particular type of activity within the informal sector. Illegal economic activity consists of the production and traffic of illegal goods and services or when the latter are not allowed when carried out by unauthorised producers/retailers. In other words, this segment consists of the criminal activities, which are often excluded from economic analyses. The underground economy comprises all unrecorded economic activities, such as the production or traffic of legal goods and services, which are deliberately concealed from the public authorities. The informal economy covers all unrecorded economic activities that are legal by the nature of the goods and services that are produced, but they are not deliberately concealed from the public authorities. Finally, household economic activities consist of productive activities that are carried out by the members of the households and are undertaken for their own final use. Alternatively, the underground, informal and household economic activities have been called 'coping strategies' undertaken in order to meet basic needs.

These four types of economic activities within the informal sector are not completely exclusive among themselves. They often overlap, thus, making it difficult to attribute one economic activity to a particular type of informality. Sometimes, it is even impossible to delineate the formal from informal economic activities since both can be performed at different times by the same enterprises or individuals. Thus,

instead of dualism, we can say that in an economy there often exists a continuum between formal and informal sectors (Kaufman and Kaliberda, 1996; Johnson et al., 1997; Blunch et al., 2001).

However, distinctions between the above-mentioned four types of economic activities within the informal sector are important since there are key differences in the incentives that motivate agents to perform each of them. Moreover, this large spectrum of economic activities within the informal sector does not allow application of universal policy measures to this sector as a whole. Another feature of the informal sector is the pronounced difference in productivity of labour among these different types of economic activities. *A priori* we can expect, that the productivity of labour in illegal production is likely to be greater than the productivity in the underground, informal or household production, the latter largely consisting of small-scale, labour-intensive operations, where the majority of workers are low skilled or unskilled (Blunch et al., 2001). Furthermore, given the nature of the underground, informal and household activities mostly viewed as 'coping strategies' we assume that they are characterised by a lower productivity level than the employment in the formal sector.

4.2.3 Causes of the informal sector

Research on the informal economy has identified a number of factors that influence the size and structure of the informal sector. First, as summarised by Schneider and Enste (2000), the main cause of a flourishing informal economy is the burden of tax and social security contributions, intensity of regulation, and the disincentive effects of social transfers. All these factors create a tax wedge, which consist of the difference between the total cost of labour and after tax earnings. The greater is this difference, the higher will be incentives to operate in the informal sector. Most of the empirical studies surveyed in Schneider and Klinglmair (2004) find a positive relationship between the level of the informal economy and the intensity of the tax burden. Furthermore, particularly in less developed and transition countries some authors find that it is not higher tax rates *per se* that increases the size of the shadow economy, but the ineffective and discretionary application of the tax system by governments (Johnson et al., 1998; Friedman et al., 2000; Schneider et Klinglmair, 2004).

Second, the intensity of regulation, as an important source of informal economic activities, can be measured by the number of laws, and regulations such as licences requirements. Intensive regulation can considerably increase the cost of labour and, therefore can influence the choice between working formally or informally. The second aspect of the regulation can be viewed through the level of enforcement of formal rules (Johnson et al., 1998; Ihrig and Moe**,** 2001). The related empirical findings show that stricter enforcement of the rule of law implies a smaller amount of informal employment (Almeida and Carneiro, 2005). Consequently, various combinations of the number of laws and regulations in a given economy coupled with corresponding level of enforcement can produce various levels of intensity of regulation, which ultimately affects the share of informal economy. In this context, the level of corruption has been identified to be in close relation with the size of informal economy. The relationship between corruption and the informal economy is not simple since they can be viewed either as complements or substitutes (Eilat and Zinnes, 2000). In order to determine the impact of corruption upon the size and structure of the informal sector, we should be aware of the problem of endogeneity, which means that certain level of informal economy can cause corrupt behaviour in the public authorities.

Third, the common reliance only on the level of taxes and, intensity of regulation as explanatory variables for the informal economy can be somewhat puzzling. Labour market rigidities such as reductions in working hours or early retirement also offer opportunities for individuals to work in the informal sector. Highly protective labour market institutions, such as strong employment protection legislation reduce the intensity of labour market flows. Thus, labour market institutions in highly regulated labour markets can widen the gap between insiders and outsiders, which eventually encourages the involvement of the latter in the informal economy (Anderberg, 2003).

Fourth, poorly provided public goods and services are often assumed as an incentive to operate in the informal sector (Johnson et al., 1997; Loayza, 1997). In economies where the size of the informal sector is already high, budget revenues are significantly reduced due to erosion of the tax base. In this case, those who operate in the official sector have to shoulder a heavier tax burden, which creates additional incentives to operate in the informal sector. This generates a vicious circle, where firms leaving the official sector contribute to reduced budget revenues and lower

quality and quantity of publicly provided goods and services, which ultimately reduces the incentives to work in the official sector.

Fifth, the characteristics of the labour market flows are also viewed as determinants of the size of the informal sector. As demonstrated in Chapter 3, the less dynamic labour markets, *i.e.* sclerotic labour markets, are characterised by a stagnant unemployment pool, where most of the long-term unemployed become 'discouraged workers' and experience a low probability of employment. Assuming that employment in the informal sector is much more socially acceptable for long-term unemployed and 'discouraged workers' than for those who face a higher probability of becoming formally employed, we can expect that sclerotic labour markets are particularly affected by informal work arrangements. The causality between the stagnant unemployment and the extent of informal economy can be considered in reverse direction *i.e.* the possibility of having casual work can create potential preconditions for stagnant unemployment (Kupets, 2005).

Finally, there exist peculiar factors relevant for developing and transition countries that can cause a large informal economy such as poverty and social exclusion. In these countries, due to the low level of wages and social protection such as unemployment benefits and pensions, informal and household production can arise as potential survival strategies for marginalised and socially excluded segments (Bernabe, 2002). Moreover, according to the 'chain effect' hypothesis the informality often has contagious effects, meaning that firms' decisions on whether to work formally or informally potentially depend on the status of their suppliers or purchasers (Paula and Scheinkman, 2006).

4.2.4 Measuring the size of the informal economy

The size of the informal economy can be measured by various methods. Generally, the existing approaches are divided into three groups: direct approaches, indirect approaches and model-based approaches (Schneider and Enste, 2000; Schneider, 2002; Schneider and Klinglmair, 2004).

The direct approach to measurement of the size of informal economy is based on survey or tax auditing methods. This approach covers a number of methods, also known as micro-methods. One possible way is to include additional questions concerning informal economic activities in the existing surveys such as LFS or

Household Consumption Survey. Another approach is by designing a special questionnaire for those enterprises that operate informally. The advantage of survey-based estimates is that they allow assessment of the socio-economic structure of the population, which is involved in the informal economic activities. A disadvantage of this approach arises from its self-reporting character which, having in mind the nature of the informal sector, can mask its true size.

The indirect approach consists of various methods that are also known as macro-methods, because they are based on macroeconomic indicators. In this group of methods are the following: examination of the discrepancy between national expenditure and income statistics, the discrepancy between official and actual labour force, the transaction method, the currency demand method, and the physical input (electricity consumption) method. A common characteristic of all macro-methods is that their estimates are based on observable macroeconomic indicators that are supposed to be correlated with the size of informal economy. Unlike the micro-methods, which obtain point estimates, the advantage of macro-methods is that they can, in principle assess the dynamics of the informal economy during a certain period of time. The most frequently stated disadvantage of the indirect approach is the high level of variability of estimates obtained by using these different macroeconomic indicators (Bernabe, 2002). In addition, Blades and Roberts (2002) point out that macro-methods 'tend to produce spectacularly high measures, which have no sound scientific base but which, despite this, attract much attention from politicians and newspapers' (p.5).

Finally, the model-based approach relies on the so-called technique of 'soft modelling', where the unobserved variable, *i.e.* the size of the informal economy, is estimated by using multiple causes and multiple indicators of the phenomenon to be measured. The most frequently identified causes for the informal economy are the following: tax burden, intensity of regulation, and the so-called 'tax-morality'. The most commonly used indicators for a change in the size of informal economy are: development of monetary indicators, development of the labour market, and development of production market (Schneider and Klinglmair, 2004). One of the most frequently used model-based methods in the measurement of the informal economy is the so-called DYMIMIC method, which is the acronym of Dynamic Multiple-Indicators Multiple-Causes (Schneider and Enste, 2000; Schneider, 2002).

4.2.5 Informal economy within the LFS context

The LFS can be used as source for estimation of the size of informal and household sectors as specific types of informal economic activities. Within the LFS framework, established according to the ILO standards, there is distinction between employment in the informal sector and informal employment (ILO, 2003; Hussmanns, 2004). The difference between the two above-mentioned notions arises from the different units of observation, employment in the informal sector being an enterprise-based concept, whereas the informal employment is a job-based concept. Employment in the informal sector was defined in the 15th International Conference of Labour Statisticians (ICLS) as comprising all jobs in informal sector enterprises, or all persons who, during a given reference period were employed in at least one informal sector enterprise, irrespective of their employment status and whether it was their main or a secondary job. Informal employment as defined in the 17th ICLS consists of the total number of jobs, whether carried out in formal sector enterprises, informal sector enterprises, or households, during a given reference period (ILO, 2003).

Having in mind the above-mentioned difference between employment in the informal sector and informal employment, we can graphically represent this distinction in Figure 4.1. Cells that are shaded in dark grey refer to jobs that do not exist in the type of production unit in question. Cells that are shaded in light grey refer to formal jobs. Cells that are not shaded at all represent various types of informal jobs. Employment in the informal sector consists of cells 3 to 8, whereas informal employment encompasses cells 1 to 6 and 8 to 10 (ILO, 2003).

Figure 4.1 Conceptual framework for informal employment

Production units by type	Jobs by status in employment								
	Own-account workers		Employers		Contrib. family workers	Employees		Members of producers' cooperatives	
	I	**F**	**I**	**F**	**I**	**I**	**F**	**I**	**F**
Formal sector enterprises					**1**	**2**			
Informal sector enterprises	**3**		**4**		**5**	**6**	**7**	**8**	
Households	**9**					**10**			

Source: ILO (2003)

According to the conceptual framework presented in Figure 4.1, total employment is disaggregated in two dimensions: types of production units and types of jobs by status in employment. We can distinguish between the following types of productions units: formal sector enterprise, informal sector enterprises and households. On the other hand, there are five different types of jobs by employment status: own-account workers, employers, contributing family workers, employees and members of producers' cooperatives. In each of these types of jobs by employment status, excepting the contributing family workers, formal and informal jobs can be distinguished. The contributing family workers by the nature of their jobs are assumed not to have explicit written contracts and their employment is not subject of labour legislation, social security regulation or collective agreements.

This assessment of the informal sector by LFS provides a number of advantages, but also has some limitations. One of the advantages is its low cost in measuring informal employment, since it can be implemented by including additional questions concerning employment in the informal sector in the existing survey. Another advantage of this approach is the higher frequency of LFS than other specialised surveys.[25] Moreover, LFS is more appropriate for estimating the fraction of labour force engaged in the informal sector as opposed to other methods whose estimates refer to informal sector as a fraction of the total economy. Finally, LFS allows assessment of the informal employment as a main economic activity and also as a secondary job.

[25] For example, we should recall that since 2004 the Macedonian LFS has been carried out on quarterly basis.

In our view, the disadvantages of LFS as a measure of employment in the informal sector are: its short reference period which does not allow capturing seasonal variations, difficulties in the identification of informal sector enterprises, and the limited possibility of disaggregating the data by branch of economic activity. In addition, when using the labour approach we identify two sources that lead to an underestimation of the informal sector. First, because of the self-reporting characteristic of the LFS, it is reasonable to assume that a certain number of respondents who are informally employed declare themselves as unemployed or inactive in order to avoid sanctions for not having complied with legal regulation. Second, since much of the informal economic activities are undertaken in firms that participate in both the informal and formal sectors, if all the workers of such firms are considered as formally employed this method will seriously underestimate the informal economy. Consequently, the results of the LFS can be misleading, giving inaccurate information on the true size of informal economy. Taking into account the above-mentioned strengths and weaknesses of the LFS, we advise using this approach as an alternative source for estimating the size and structure of the informal economy in transition countries. An assessment of the informal employment in Macedonia based on LFS will be also used in our analysis in section 4.4.

4.2.6 Effects on the official economy

The overall effect of the informal economy on economic growth and development is ambiguous since it has several impacts, some negative and some positive. The negative effects can be summarised in the following points. First, there exist potential revenue loss due to tax evasion by agents working in the informal sector, which in turn implies a weakening of public finances and public investment (Ihrig and Moe, 2001). Second, the shortages in budgetary financing may force governments to resort to inflationary financing. Third, there is increased likelihood that official statistics provide inaccurate indicators for macro-policy decisions. Fourth, the presence of the shadow economy can cause the macro-policies, both monetary and fiscal, to have weaker stimulative effects *i.e.* to be less effective (Eilat and Zinnes, 2000). Finally, at the micro-level working unofficially may result in inefficient resource allocation, lower private sector investments and focus on a short-term horizon (Loayza, 1997). Alongside these economic implications, a large

informal economy also has a number of negative social implications such as worsening social norms, diminished respect for official institutions and circumvention of the rule of law.

The beneficial impact of the informal economy can be viewed first through its role as a significant source of employment and income-generating opportunities, particularly in developing countries where it provides the necessary social safety net (Ihrig and Moe, 2001). This role is especially important during the downturns because of counter-cyclical character of the employment in the informal sector (Eilat and Zinnes, 2000; Blunch et al., 2001). Second, the informal sector also helps to enhance entrepreneurship, create markets and other legal, social, and economic institutions that are necessary for accumulation and increases competitive pressures on the official sector (Schneider and Klinglmair, 2004). Finally, as argued by Schneider (2002), the positive stimulating effect of the informal economic activities on the official economy is observed by the fact that almost two thirds of the income earned in the informal economy is immediately spent in the official economy.

4.3 Empirical evidence on the informal sector in transition countries

The rising trend of informal economic activities during the period of transition has been pointed out by the number of authors (Eilat and Zinnes, 2000; Boeri and Garibaldi, 2005). The initial transformational recession, elaborated in Chapter 1, generated a number of preconditions that subsequently led to an increase in the size of the informal sector. One of them was the accumulation of long-term unemployment that caused a large fraction of unemployed to become 'discouraged workers'. Since, we have assumed that these workers experience depreciation of human capital and decline in morale to search for a job, it is reasonable to expect that they are more inclined toward employment in the informal sector compared to those who are short-term unemployed. As a consequence, depressed labour markets with a large proportion of long-term unemployment such those observed in SEECs are more likely to have a sizeable informal sector.

4.3.1 Measurement of the informal sector in transition countries

Among the four previously mentioned forms of economic activities within the informal sector, in this research programme we are particularly interested in those

activities considered as forms of 'coping strategies', undertaken in order to meet the basic needs. In contrast, we do not intend to discuss the illegal activities that are regarded by its nature as criminal and do not meet the characteristics of an adjustment mechanism as defined in Chapter 2. However, due to the lack of disaggregated data, we are not able to estimate the relative shares of each type of informal economic activity. Instead, we deal with aggregate figures for the size of the informal sector in selected transition countries presented in Table 4.1.

Table 4.1 Size of the informal economy in selected transition countries

Country	Size of the informal sector estimated by DYMIMIC method (in % of GDP)		Informal economy labour force (in % of working age population) 1998-99[a]
	Average 1990-93[a]	Average 2002-03[b]	
Russia	27.8	48.7	40.9
Estonia	34.3	40.1	33.4
Bulgaria	27.1	38.3	30.4
Romania	27.3	37.4	24.3
Macedonia	35.6	36.3	35.1
Croatia	24.6	35.4	27.4
Poland	22.3	28.9	20.9
Slovenia	22.9	29.4	21.6
Hungary	22.3	26.2	20.9
Slovakia	15.1	20.2	16.3
Czech Republic	13.1	20.1	12.6

Sources: [a] Schneider (2002), [b] Schneider (2005).

In Table 4.1 we give figures for the size of informal sector as percentage share of GDP for two distinct periods: 1990-93 and 2002-03. We notice a significant increase in the informal economy in almost all transition countries under consideration during the first decade of transition. The smallest size of the informal sector is registered in the Czech Republic and Slovakia, while the largest is found in Russia, Estonia, Bulgaria and Romania. It is also worth noting that the percentage share of labour force engaged in the informal sector in most transition countries is lower or at least is in the same range as the corresponding share of the informal economy as a percentage of GDP. We assume that in countries where the gap between the above-mentioned figures is higher in favour of the size of informal sector as percentage share of GDP, there is a higher proportion of illegal activities and vice-versa. Moreover, in this case the labour productivity in the informal sector is higher than the productivity in the official sector, which creates additional incentives for operating in the informal sector.

The most frequently applied methods for estimating the size of the informal economy in transition countries are macro-methods. Kaufman and Kaliberda (1996), pioneers in this domain, measured the size of the informal economy in transition countries by using the total electricity consumption method. However, as elaborated in section 4.2.4 the application of macro-methods suffers from a number of shortcomings. In transitional context, the macro-methods are neither suitable in the identification of those who are involved in the informal economic activities nor in providing consistent estimates of the size of the informal sector (Lacko, 2000; Feige and Urban, 2003; Hanousek and Palda, 2004). At this point we present several criticisms that indicate the inappropriateness of the macro-methods in transition countries.

For instance, Lacko (2000) has criticised the electricity consumption approach by arguing that most of the informal economic activities in transition countries are carried out within households and therefore do not exert a significant additional impact on electricity consumption. As an alternative, she has proposed adapting the household electricity consumption approach, adding to the multitude of modified versions of the electricity consumption method applied in transition countries (Eilat and Zinnes, 2000; Feige and Urban, 2003). However, these approaches generally find that the estimated size of the informal economy is highly sensitive to initial starting values, which seriously undermine their reliability. Finally, Hanousek and Palda (2004) stress the inappropriateness of the electricity consumption method in the context of transition countries for the following reasons: variable elasticity of electricity use to GDP, changing intersectoral structure of the economy, impossibility of determining the base period with a zero informal economy. Similarly, the applicability of the currency to demand deposit ratio method in transition countries has been questioned because of various reasons such as: lack of credit in the early period of transition, frequent changes in bank regulations, lack of trust in banks and increased usage of barter and foreign currencies as a mean of exchange (Eilat and Zinnes, 2000).

Some authors attempt to measure the size of informal economy in transition countries by estimating the extent of tax evasion either via tax auditing (Madžarevic-Šujster, 2002) or via household surveys (Gërxhani, 2002; Zahariev, 2002). These estimations are generally consistent with the results obtained from the macro-methods showing a rising trend in the size of the informal economy during the period of

transition. Alternatively, the size and structure of informal employment in transitional context has been estimated using the LFS (Bernabe, 2003). Despite the already mentioned weaknesses of this approach, it can be used in combination with other micro and macro methods of estimation in order to obtain a more accurate picture of the informal sector size and structure.

4.3.2 Characteristics of the informal sector in transition countries

The informal economy in transition countries is characterised by idiosyncrasies which arise from the specific nature of the transitional process and require additional research effort in order to be fully explored. In the remainder of this section we will attempt to disentangle the most common characteristics of the informal sector in transition countries, particularly in the light of its role as a labour market adjustment mechanism.

First, the development of informal economy during transition can be viewed as a continuation of the legacies from pre-transitional period (Chavdarova, 2002). The previous social regime was not immune to the informal economy, usually known under the term 'second economy', which existed alongside the official economy. We argue that misallocation of resources in the socialist regimes was a main reason for the flourishing informal sector. The informal economic activities in pre-transitional period took various forms from legal economic activities such as private agricultural production to illegal economic activities such as stealing from the state, speculation, illicit production and underground production (Bernabe, 2002).

Second, informal economic activities in transition countries are frequently performed as a second job by those who are otherwise formally employed. Thus, transition countries are characterised by a continuum in the formal/informal spectrum rather than a sharp dichotomy (Kaufman and Kaliberda, 1996; Eilat and Zinnes, 2000). Multiple job holdings or 'moonlightings' have been an obvious characteristic of the early stage of transition, where due to various forms of non-monetary compensations in the declining state sector, workers remained attached to their formal employment alongside their second informal job (Commander and Tolstopiatenko, 1997).

Third, the informal economic activities are mainly concentrated in trade and services, followed by manufacturing sector (Blunch et al., 2001). In less advanced

transition countries agricultural production for own consumption plays an important role as unobserved economic activity which is essential survival strategy and may account for up to half of total agricultural output (Blades and Roberts, 2002; Commander and Rodionova, 2005). The above arguments are in line with the sectoral reallocation in Macedonia elaborated in Chapter 1 (section 1.4.2), according to which the share of employment in subsistence agriculture demonstrated a significant rise.

Fourth, the informal businesses usually operate on a small-scale basis either in the form of self-employment or as micro or small enterprises (Ruli, 2002). Having in mind the modest market experience at the outset of transition, the informal sector in this context has played an important role in the mobilisation of entrepreneurial endeavours by supplying basic goods and services (Fleming et al, 2000). Moreover, in depressed labour markets which lack job creation in the formal sector, informal employment helps people to enter the workforce by offering an alternative to unemployment or inactivity and, prevents a further decline in living standards (Gorisov, 2005). Due to the small size or self-employment character, informal businesses are rarely subject to tax audits or other inspections which, significantly reduces their probability of being caught (Zahariev, 2002).

Fifth, the majority of informal jobs in transition countries are temporary and characterised by poor working conditions (Kolev, 2005). Because of the precarious nature of the informal sector, workers are deprived of many social rights such as retirement, disability and unemployment benefits, paid vacation, occupational safety and health and so forth (Maslova and Baranenkova, 2004). Therefore, the identified labour market segmentation in Chapter 1 (section 1.4.3) arises not only because of the differences in employment prospects between the various labour market segments, but also because of the differences in working conditions between employment in the formal and informal sector.

Sixth, workers in the informal sector are usually low skilled or unskilled and perform labour-intensive operations (Blunch et al., 2001). Therefore, the informal sector primarily employs workers who are less competitive in the labour market such as youths, workers at retirement age and, workers with low levels of education or without a vocation (Gorisov, 2005). In addition, a majority of these workers experience the so-called 'informal employment trap' *i.e.* they face a low probability of exiting the informal employment. At the micro level, there is increased human capital erosion experienced by workers who work in the informal sector due to the

labour-intensive characteristics of the informal employment and absence of vocational training (Mojsoska, 2006). This phenomenon is compounded by an 'internal brain drain' which is associated with outflow of skilled workers from the formal economy to the sphere of informal activities that do not require high levels of vocational training (Gorisov, 2005).

Finally, the rapid growth of the informal sector in transition countries, accompanied by erosion of their tax bases, is viewed as a 'bad' equilibrium characterised by a heavy tax burden on the firms in the formal sector that causes a large number of firms to operate informally (Johnson et al., 1997; Bouev, 2004). The reduced revenues and the increased need for financing the large social security programmes, furthermore dramatically deteriorate the quality of publicly provided services. This is an important factor in firms' decision making to work formally or informally. The 'bad' equilibrium thus implies an inadequate provision of public goods and services which, ultimately, results in a lower growth rate. The possibility of multiple equilibria outcomes in transitional labour markets will be the subject of our model of sustainable rate of unemployment formally developed in Chapter 7.

4.3.3 Determinants of the size of the informal sector in transition countries

In this section we pursue an analysis of the underlying factors that influence the size of the informal economy in transition countries. Having in mind the previously elaborated peculiarities of the informal sector in transition countries, the development of an appropriate model is not a simple task. In order to avoid possible model specification errors, we have attempted to build our model by maintaining consistency with the established theory (section 4.2.3) and the related empirical literature for transition countries (section 4.3.2). For this purpose we have explored several specification forms that contain various explanatory variables such as: the level of corruption, rigidity of regulation, fiscal burden, corporate tax rate, unemployment rate, rigidity of employment and various measures indicating the advance in transitional reforms. The summary results from the estimation are presented in Table 4.2.

Table 4.2 Various specifications of the model explaining the size of informal sector (dependent variable: Size of the informal sector as a percentage share of GDP)

Explanatory variables	1	2	3	4	5
Constant	48.29** (2.33)	62.50** (6.55)	90.94** (6.44)	94.50** (7.32)	117.70** (7.92)
CPI	-5.11* (-1.99)	-6.66** (-3.73)	-3.86* (-1.86)	-4.23** (-2.11)	-4.61** (-2.68)
Regulation	4.21 (1.02)				
Fiscal burden				-5.00* (-1.72)	
Corporate tax rate	-0.29 (-0.77)		-0.46 (-1.49)		-0.64** (-2.42)
Unemployment rate		-0.42* (-1.95)		-0.46** (-2.37)	-0.79** (-4.15)
Rigidity of employment		0.12 (0.74)			
Enterprise restructuring			-11.13** (-2.87)		
Competition policy					-16.43** (-3.76)
Overall infrastructure reform				-7.86** (-2.15)	
Adjusted R-squared	0.28	0.38	0.47	0.51	0.64

*** significant estimate at 5% level; * significant estimate at 10% level*
Source: Author's calculations; t-statistics are in parentheses.

From Table 4.2 we notice that specifications in columns 1-4 although consistent with the theoretical orthodoxy contain statistically insignificant variables and have little explanatory power. For instance, the intensity of regulation as an explanatory variable is not statistically significant in specification 1. Similarly, the corporate tax rate is not statistically significant in specifications 1 and 3, whereas rigidity of employment in specification 2. Accordingly, we propose a multiple regression model where the corporate tax rate, level of corruption, competition policy and unemployment rate are used to explain the size of the informal sector in transition countries (column 5). Moreover, the adjusted coefficient of determination in specification 5 has the highest value compared to the values in the alternative specifications. Thus, the proposed model rules out the competing specifications in terms of goodness of fit and statistical significance of the estimated parameters *i.e.* other models cannot be an improvement over the chosen model.

Therefore, the formal specification of our model has a form as presented in (4.1).

$$IS_i = \beta_0 + \beta_1 Tax_i + \beta_2 CPI_i + \beta_3 Comp_i + \beta_4 U_i + v_i \quad \ldots (4.1)$$

where symbols stand for the following variables:

IS – Size of the informal sector as a percentage share of GDP

Tax – Corporate tax rate

CPI – Corruption Perception Index

Comp – Competition policy index

U – Unemployment rate

Since, there is no unique source of data for all variables we use several different publicly accessible sources, where 2003 represents a cross-section year. The data on the size of the informal sector is taken form Schneider (2005). Furthermore, data on regulation, fiscal burden and corporate tax rates have been provided from the Heritage Foundation database, which is a source of internationally comparable data. The Transparency International database has served as a source for our measure of the level of corruption and their Corruption Perception Index (CPI) is used. The scores on the progress in reforms in various dimensions such as enterprise restructuring, competition policy and overall infrastructure reform have been taken from the EBRD Transition report (2005). The data on rigidity of employment, social security contribution and poverty have been provided from the World Development Indicators (World Bank, 2005b). Finally, the ILO-LABORSTA database has been used as a source of data for unemployment.

With regard to the nature of above-described data, at least two limitations should be born in mind. First, the accuracy of scores representing a country's achievements on a given scale is sometimes questionable because they are based on judgements. Second, most of the above indicators are bounded and are ordinal in nature. For example, according to Transparency International, CPI is measured on the scale from 1 to 10, where higher value stands for a better score of a country. Similarly, the EBRD index of competition policy is measured on the scale from 1 to 5 with higher score indicating more advanced phase of reforms. However, the ordinal characteristic of the indicators does not imply that difference between a score 1 and 2, for example is the same as between 2 and 3, since it is easier to make first steps of

reforms, but much harder to complete the entire process (Falcetti et al., 2006). In addition, we should also be aware of the reverse causation problem *i.e.* the possibility that the size of informal sector determines the size of the assumed explanatory variable.

Before presenting the results from our empirical analysis, we briefly discuss the expected relationships between the size of informal sector and selected explanatory variables. Even though theory assumes that higher taxes induce a larger informal sector, the empirical findings from transition countries are less clear-cut. For instance, Friedman et al. (2000) suggest that higher taxes are associated with lower shadow activity, since higher taxes may afford better quality of public services which subsequently attracts firms into official economy. From our theoretical exposition, the relationship between the size of informal sector and corruption is ambiguous, though most of the empirical findings suggest their complementarity (Johnson et al., 1998; Friedman et al., 2000). Furthermore, a more competitive economy in terms of low 'entry barriers' to firms contemplating a movement into official economy, would promote a smaller informal sector (Eilat and Zinnes, 2000). Finally, the relationship between the size of informal sector and unemployment is the issue of our greatest concern. Assuming an accurate assignment of workers to each of the labour market statuses, we can expect that reduced unemployment is associated with an increase in the informal employment. This is particularly relevant for depressed labour markets, though in the case of low unemployment workers can search/wait for better jobs to become vacant in the formal economy. However, a false assignment of a considerable number of informally employed workers as unemployed may result in a simultaneous increase in estimated figures of both unemployment and informal employment (Chapter 1, section 1.7).

The estimation technique in this analysis is based on the ordinary least squares for a sample containing cross-sectional data for 23 transition countries (Appendix 4.1). The summary results from the estimation of the multiple regression model (4.1) are presented in Table 4.3 where dependent variable is the size of the informal sector as a percentage share of GDP.

Table 4.3 Summary results from the estimated multiple regression model (4.1) (dependent variable: Size of the informal sector as a percentage share of GDP)

Variable	Value	Std. error	t-value	Pr (>| t |)
Intercept	117.7019	14.8678	7.9166	0.0000
Tax	-0.6391	0.2642	-2.4186	0.0264
CPI	-4.6084	1.7183	-2.6820	0.0152
Comp	-16.4273	4.3712	-3.7581	0.0014
U	-0.7886	0.1899	-4.1527	0.0006
Multiple R-Squared: 0.7015; Adjusted R-Squared: 0.6352 F-statistic: 10.58 on 4 and 18 degrees of freedom, the p-value is 0.0001376 Lagrange multiplier test of residual serial correlation: 0.0596 (0.807)* Ramsey's RESET test for the functional form: 0.1886 (0.664)* Jarque-Bera test for normality of residuals: 0.1526 (0.927)* Koenker-Bassett test for heteroscedasticity: 4.9565 (0.026)* **In the parentheses are given probabilities of obtaining the estimated statistics*				

Source: Author's calculations

From Table 4.3 we notice that all estimated coefficients in the multiple regression model (4.1) including the constant are statistically significant at 5 percent level or higher. Moreover, the explanatory power of our model is reasonably high since the coefficient of determination shows that about 70 percent of the variation in the size of the informal sector is 'explained' by the combination of the above independent variables. Although *a priori* we suspected that multicollinearity may be a problem with our estimates, the significance of the variables suggests that this is not the case and there is sufficient independent variation in our variables. In addition, the diagnostic tests show that only heteroscedasticity appears to be a substantial problem, which implies possibly inefficient estimates. Furthermore, as possible remedial measure we have calculated White's heteroscedasticity consistent variance-covariance matrix and standard errors (Appendix 4.2). We see that the standard error of the intercept coefficient has slightly increased, whereas the standard errors of other coefficients have slightly decreased without significantly influencing the initial statistical inference.

The sign of the coefficient for corporate tax rate is negative indicating that one percentage point increase *ceteris paribus* is associated with decrease of 0.64 percentage points in the size of the informal sector. This finding is in line with some above-mentioned empirical evidence that increases in taxes may result in lowering the size of informal sector thus manifesting a disagreement with orthodox theory. However, we have to take into account that the average corporate tax rate in transition

countries is low relative to the EU average and coupled with a low level of tax morality, which further deteriorates the capacity of the governments in providing effective public goods and services.[26] The difficulties encountered in tax collection in less-developed transition countries can be attributed to a lack of formal institutions and/or the weakness of those already in existence (Papava and Khaduri, 1997). In our view, the improvements in the tax collection administration represent the mechanism which explains how an increase in the corporate tax rate can eventually be translated into a decrease in the size of the informal economy.

Furthermore, according to the estimates from Table 4.3, a one point increase in CPI *ceteris paribus* is associated with decrease of 4.61 percentage points in the share of the informal economy. Therefore, our finding corroborates the previous empirical evidence about significant positive relationship between corruption and the size of the shadow economy, which ultimately may be due to the fact that both variables may be caused by a third factor such as weak enforcement of the rule of law (Eilat and Zinnes, 2000). A one point increase in the competition policy index *ceteris paribus* is associated with a larger decrease of 16.43 percentage points in the share of the informal economy. Therefore, according to our results transition countries that promote a more competitive environment in terms of breaking-up dominant conglomerates and reducing entry restrictions to official sector indirectly reduce the incentives for firms to operate in the informal sector. Finally, the unemployment rate in our model appear with negative sign indicating that a one percentage point increase *ceteris paribus* is associated with decrease of 0.79 percentage points in the size of the informal sector. Consequently, assuming an accurate assignment of workers, employment in the informal sector may appear as absorber of unemployment, particularly in the cases of insufficient job creation in the formal part of the economy. Nevertheless, because of the complexity of the relationship between the informal sector and unemployment, we provide a more detailed analysis of this relationship in the next section. According to the estimated coefficients the predicted size of the informal sector in Macedonia is 35.7 percent, which is close to the originally observed value of 36.3 percent. Therefore, we can justify the choice of the proposed model by confirming its strong in-sample predictive power.

[26] As an illustration, the average corporate tax rate in SEECs in 2003 was around 20 percent, whereas the EU average rate for the same period was 32 percent (EBRD, 2004).

4.3.4 The relationship between the informal sector and unemployment

In this section we further explore the relationship between unemployment and the informal sector in order to determine to what extent the latter has absorbed unemployed workers, thus playing a role of a labour market adjustment mechanism. As noted above, we found a statistically significant interdependence between the unemployment rate and the size of the informal sector. Moreover, the bivariate correlation coefficient between the size of informal sector and unemployment rate for the whole set of transition countries is negative indicating that in total they interact as substitutes. However, given the problem of heterogeneity which is typical for cross-sectional data we now pursue a deeper analysis in order to identify how these two variables interact in particular subsets of transition countries. For this purpose we classify the transition countries in a two-by-two scheme, where rows correspond to the size of the informal sector (small or big) while, columns correspond to the extent of the unemployment rate (low or high). The results of this classification are presented in Table 4.4.

Table 4.4 Classification of transition countries according to the size of informal sector and unemployment rate

	Low unemployment rate (less than 10 percent)	High unemployment rate (greater than 10 percent)
Small informal sector (less than 30 percent)	Czech Republic Hungary Slovenia	Poland Slovak Republic
Big informal sector (greater then 30 percent)	Azerbaijan Belarus Estonia Kazakhstan Kyrgyzstan Moldova Romania Russian Federation Ukraine	Albania Armenia Bosnia and Herzegovina Bulgaria Croatia Georgia Latvia Lithuania Macedonia

Source: data in Appendix 4.1

From Table 4.4 we notice a pronounced dispersion among transition countries classified in the informality-unemployment space. It is reasonable to assume that informal employment and unemployment are complements for those countries that appear in the two blocks on the principle diagonal. In contrast, they are substitutes for the countries located in the two remaining blocks of the square scheme.

According to the classification, we can draw several conclusions. First, three out of five countries among the CEECs belong to the most desirable combination of low unemployment and small informal sector, with Poland and Slovakia being the exceptions because of their slightly higher unemployment rates.

Second, the majority of the CIS countries belong to the group characterised by high shares of informal sector and low unemployment rates. For this group of countries we assume operation of the link between slow advancement in the process of transitional restructuring coupled with labour hoarding in the state sector and increased informal employment due to the insufficient absorption capacity of the emerging private sector.

Third, the majority of SEECs clearly belong to the group of transition countries with high shares of informal economy and high unemployment rates as well. This is in line with the empirical findings revealing that high unemployment is often coupled with a high rate of informal economy, a phenomenon also known as 'shadow puzzle' (Eilat and Zinnes, 2000; Boeri and Garibaldi, 2005). According to the 'shadow puzzle', the informal employment and unemployment are two faces of the same coin that ultimately require complementary policy measures for their reduction (Boeri and Garibaldi, 2002). Furthermore, high shares of informal sector accompanied by a high unemployment rate may indicate an overlap between these two categories due to the overestimation of unemployment *i.e.* false identification as unemployed of those who are *de facto* informally employed (Chapter 1, section 1.7). The relationship between unemployment and employment in the informal sector will be reconsidered in Chapter 7 where we model the role of the informal sector as a labour market adjustment mechanism.

4.4 The informal employment in Macedonia

Having in mind the depressed characteristics of the Macedonian labour market with low labour demand and labour force participation, we expect the informal sector to play a significant role as a form of labour market adjustment. In order to assess the employment in the informal sector in Macedonia, we first briefly analyse estimates based on macro methods, followed by an analysis of its composition based on LFS. Taking into account the idiosyncrasies in transition countries identified above, as well

as the limitations of each of the two above-mentioned approaches, we use them both in order to obtain a more complete picture about Macedonian informal sector.

4.4.1 Macro estimates of the Macedonian informal sector

A number of authors have estimated the size of the informal sector in Macedonia using various macro-methods (Johnson et al., 1997; Lacko, 2000; Schneider, 2002; Schneider, 2005). According to their results, Macedonia together with other SEECs belongs to the middle range of the informality scale. When it comes to the extent of informal economic activities it is evident that SEECs in total perform better *i.e.* on average have lower unemployment sector than CIS countries, but they manifest worse indicators than CEECs (Falcetti et al., 2003). Moreover, as we have seen the large informal sector in this group of countries has been coupled with high unemployment and poverty rates which give the informal employment the character of 'coping strategy'. The size of the informal economy in Macedonia by using various estimates based on macro-methods is presented in Table 4.5.

Table 4.5 Various estimates of the informal economy in Macedonia(percent)

Source	Method of estimation	Estimated variable	Period	Size
Johnson et al., 1997	Physical Input (Electricity) Method	Shadow economy (in % of GDP)	1990-1993	34.5
Schneider, 2002	DYMIMIC method	Shadow economy (in % of GDP)	1990-1993	35.6
Johnson et al., 1997	Physical Input (Electricity) Method	Shadow economy (in % of GDP)	1994-1995	40.3
Lacko, 2000	Household electricity consumption (based on *ex post* calculation)	Ratio of the hidden economy to the official GDP	1995	44.2
Schneider, 2002	DYMIMIC method	Shadow economy labour force (in % of working age pop.)	1998-1999	35.1
Schneider, 2002	DYMIMIC method	Shadow economy (in % of GDP)	2000-2001	45.1
Schneider, 2005	DYMIMIC method	Shadow economy (in % of GDP)	2002-2003	36.3
World Bank, 2005a	Survey-based figure	Informal employment (% share of total employment)	2002-2003	40.0

According to figures in Table 4.5 we can argue that estimates of the size of the informal sector in Macedonia are sensitive to the method used. However, we notice that even the earliest estimates show a high relative share, accounting for about 35

percent of the total output (Johnson et al., 1997; Schneider, 2002). Subsequently, for the first decade of transition the estimated size of the informal sector increased by almost 10 percentage points. The latest macro-estimates of the informal sector indicate a significant fall in the relative share from 45.1 in 2001 to 36.3 in 2003 (Schneider, 2002; Schneider, 2005). Even though based on different measures and originating from different sources, the above macro-estimates represent good starting point for the analysis of the development of Macedonian informal sector over time. Having in mind the previously presented criticism of the macro-methods for transition countries, in the next section we resort to the LFS as an alternative source of data in order to unfold more evidence about the characteristics and composition of Macedonian informal employment.

4.4.2 Assessment of Macedonian informal sector based on LFS

Taking into account the strengths, as well as the shortcomings of the methodological approach based on LFS, in this section we apply this approach in order to analyse the composition of the Macedonian informal employment. According to the Macedonian LFS, it is possible to distinguish the following types of informal employment as a main activity: (1) non-regular employees, or employees who do not have 'stable contracts for whom the employing organization is responsible for payment of relevant taxes and social security contributions and/or where the contractual relationship is subject to national labour legislation' (ILO, 1993: 8), (2) contributing family workers and (3) own-account workers who are assumed to be unregistered, (4) employers without officially registered enterprises and, (5) casual, temporary or seasonal workers who can also be assumed that avoid applying the labour code and who engage in such types of employment in order to meet basic needs.

If we relate this classification to the conceptual framework, presented in Figure 4.1, we see that non-regular employees correspond to cell 2, contributing family workers correspond to cells 1 and 5, own-account workers correspond to cells 3 and 9, employers without officially registered enterprises correspond to cell 4 and, casual, temporary or seasonal workers correspond to cells 6 and 10. There is only one category, which is not included in the earlier presented framework of informal employment that is members of producers' cooperatives (cell 8). The reason for such

an omission is that this category does not currently exist in the Macedonian LFS as a separate type of employment status. However, we can approximate that the sum of the five above-mentioned types of employment represents the total informal employment assessed from the LFS.

Additionally, by using the same source we assess the following types of informal employment as a second job: (1) contributing family workers, (2) own-account workers and, (3) non-regular employees. In these groups of workers are classified those who have already declared themselves as employed with stable contracts and paid taxes and social security contributions. Informal employment as a second job is performed as a supplement of the regular employment. The structure of informal employment in Macedonia assessed from the 2003 LFS including both employment as a main activity and second job is given in Table 4.6. To our knowledge, this represents the first attempt to provide a comprehensive analysis of Macedonian employment in the informal sector.

Table 4.6 Structure of the informal employment in Macedonia (2003)

Types of informal employment	Main activity	Second job	Total
Contributing family workers	25290 (23.8%)	13925 (65.2%)	39215 (30.7%)
Non-regular employees	30408 (28.6%)	1009 (4.7%)	31417 (24.6%)
Own-account workers	22669 (21.3%)	6416 (30.1%)	29085 (22.8%)
Employers without officially registered enterprises	15792 (14.9%)	-	15792 (12.4%)
Employees who are casual, temporary or seasonal workers	12037 (11.3%)	-	12037 (9.4%)
Total	106196 (100%)	21350 (100%)	127546 (100%)

Source: Macedonian Statistical Office, LFS 2003

According to Table 4.6, the total number of informally employed in 2003 is 127,546, among which one in six have informal employment as second job. The structure of informal employment as a main activity shows that the dominant part represents non-regular employees (28.6 percent) and contributing family workers (23.8 percent), followed by groups of own-account workers (21.3 percent), employers without officially registered enterprises (14.9 percent) and casual, temporary or seasonal workers (11.3 percent) (see Appendix 4.4). Turning to informal employment as a second job, we can conclude that dominant fraction is the group of contributing

family workers (65.2 percent), followed by own-account workers (30.1 percent) and non-regular employees (4.7 percent).

At a first glance there is a striking difference between the number of employers in unregistered enterprise on the one hand, and various types of employees who do not have stable contracts on the other hand. The possible explanation for such an outcome is the discrepancy between the level of corporate tax rate in Macedonia being among the lowest in transition countries (15 percent)[27] and, the social security contributions paid by the employers being among the highest (32.5 percent) (EBRD, 2004). Accordingly, we argue that from the behavioural point of view this combination creates incentives for most of the enterprises to operate formally, but to employ workers on an informal basis in order to avoid paying high social security contributions.

If we take into account that the total number of employed in Macedonia in 2003 was 545,100, we calculate that a fraction of 23.4 percent were informally employed. Compared with other estimations of unofficial economy labour force based on macro methods, this figure is considerably lower (see Table 4.5). Particularly, if we consider the World Bank estimate of 40 percent for the same period, there is a room for arguing that alongside with informal employment there exist so-called 'shadow unemployment' and 'shadow inactivity' accounting for about 16.6 percent of total employment. We refer to 'shadow unemployment' as a portion of LFS unemployed who work in the informal or household sector but have not declared this to the survey, whereas 'shadow inactivity' designates the portion of LFS inactive who perform informal economic activities (Boeri and Garibaldi, 2002). In fact, 'shadow unemployment' represents the overlap between unemployment and informal employment and explains the origins of the 'shadow puzzle'. In the case of Macedonia, we assume that a significant number of the unemployed are *de facto* informally employed which causes high rate of informal employment to be coupled with high unemployment rate.

Since we do not exactly know the proportion of total employment in the informal sector, we are not able to calculate the extent of the 'shadow unemployment' and 'shadow inactivity'. However, it is possible to show that the adjusted unemployment rate for employment in the informal sector is lower than officially

[27] In December 2006 the corporate tax rate has been reduced to 12 percent.

calculated unemployment rate, when 'shadow unemployment' and 'shadow inactivity' are not taken into consideration (Appendix 4.3). The adjusted unemployment rate for employment in the informal sector is calculated as a percentage share of the adjusted unemployment of adjusted labour force. Adjusted unemployment is calculated as the difference between the official number of unemployed and those considered to be in 'shadow unemployment'. The adjusted labour force is a sum of the official labour force size and the number of those who are considered to be in 'shadow inactivity'. There are various strategies that can be applied in order to estimate the extent of the 'shadow unemployment' and 'shadow inactivity'. One possible solution is by using alternative surveys such as the Household Budget Survey as source of information related to the respondents' employment status. As we have demonstrated in Chapter 1 (section 1.7), by having accounted for the categories 'shadow unemployment' and 'shadow inactivity', the unemployment rate in Macedonia is estimated to be about 10 percentage points lower than officially calculated unemployment rate (World Bank, 2003).

4.4.3 Decomposition of the Macedonian informal employment

In order to complete the analysis of Macedonian informal employment we further provide some preliminary observations of the socio-demographic structure of the population, whose informal employment is a main activity (see Appendix 4.4). As explained above, due to the lack of data we are not able to identify the composition of Macedonian 'shadow unemployment' and 'shadow inactivity'. According to the results from the decomposition of the informally employed population we discern the following features.

First, regarding the gender composition the majority of the informally employed are male (65.8 percent) who dominate in all types of informal employment except in the group of contributing family workers. Compared to the general pattern of employment by gender presented in Chapter 1 (section 1.4.2), we can conclude that the structure of informal employment does not differ significantly from the structure of employment in the economy as a whole.

Second, the informal employment is more prevalent in rural areas (61.4 percent) than in urban areas (38.6 percent). This finding suggests that a significant portion of informal employment is in agriculture and, confirms the arguments about

the role of agriculture as a 'survival strategy' in less advanced transition countries. Having in mind the low productivity of the subsistence farming we argue that overall productivity in the informal sector is lower than in the formal part of the economy (Chapter 1, section 1.4.2).

Third, among informally employed the most represented are those with primary and secondary education (37.8 percent and 37.6 percent respectively), whereas the share of those without education is 16.8 being almost twice higher than the respective share of this category in the total employment (8.4 percent). In contrast, the share of workers with higher education among the informally employed is considerably lower accounting for 7.8 percent as compared to the respective share in the total employment (18.2 percent). This is an additional argument indicating that informal economic activities in Macedonia are mostly labour-intensive and characterised by lower productivity compared to the formal employment.

Fourth, the majority of the informally employed are prime age workers (age between 25 and 44) who represent about 53 percent of those who are informally employed. This share is similar to the respective share of these age groups in total employment. According to this finding, we can conclude that an increasing number of breadwinners adhere to the informal sector due to the depressed characteristics of Macedonian labour market. This finding is somewhat at odds with the general pattern in transition countries, where disadvantaged age groups such as youth and workers who are close to retirement age represent the largest part of the informal employment.

The socio-demographic structure of informal employment as a second job generally follows the same pattern as informal employment as a main activity. Is sum, we can say that the male population, those who live in rural areas, those with lower level of education, and prime-age workers are more inclined towards holding an informal sector second job (see Appendix 4.5). It is worth noticing that relative participation in the informal sector as a second job for those with higher education is twice as high as participation in this sector as a main activity. Taking into account that the unemployment rate for those with higher education is low, it is not surprising that informal employment as a main activity is low, but is still attractive as a second job. In addition, the above pattern might be attributed to the low paying jobs in public sector and higher education institutions which mainly employ workers with higher education.

By summarising the above-presented analysis of the structure of informally employed, we can conclude that the characteristics of informal employment in Macedonia are in line with general characteristics of the informal sector in transition countries. In other words, the Macedonian informal sector predominantly consists of small-scale agricultural production carried out by workers with low levels of education who are either employees without stable contracts or unpaid contributing family workers. Thus, if we consider only those economic activities that are undertaken in order to meet basic needs, it is reasonable to assume that the level of productivity in the informal sector is lower than the level of productivity in the formal part of economy.

4.5 Conclusion

The transition from a centrally-planed to a market economy has been characterised by a growth in the size of the informal sector, often considered as a continuation of the so-called 'second economy' that existed in pre-transitional period. Considering the measurement of the informal sector in transition, we have argued that methods based on the observable macroeconomic indicators are unreliable because of the unstable macroeconomic environment, whereas micro-methods based on surveys lack accuracy because of their self-reporting characteristics. Having identified that there is no unique and precise estimation method of the size and structure of informal sector, we have decided to rely on several estimates provided from different sources. In particular, in the analysis of the Macedonian informal employment we have combined the macro-estimates and LFS as a source of data that allowed decomposition of the informally employed population.

Generally, the informal sector in transition countries is marked by a number of peculiarities which make informality in transition distinct from that observed elsewhere. Among the potential factors that influence the informal sector in transition countries we identify that a higher corporate tax rate is associated with a smaller informal economy. This may reflect that the effect of providing better publicly provided services and improved tax morality. Additionally, more competitive economic environment characterised by low entry barriers to the official sector causes decrease the size of the informal sector. In contrast, a higher level of corruption is coupled with a larger informal economy indicating that the so-called 'lagging

reformer' countries that failed to undertake a fast restructuring of their state sector often suffered from a high level of corruption all leading to a relatively larger informal sector.

In analysing the role of the informal sector as a labour market adjustment mechanism, we did not find unique pattern that explains the relationship between the size of informal sector and unemployment. While in some transition countries a large informal sector is associated with a low unemployment rate, in others they go hand in hand. In this context, we can distinguish SEECs which belong to the latter group of transition countries that experience the so-called 'shadow puzzle'. Given the self-reporting character of the LFS we believe that in the case of depressed labour markets, a significant number of the employed in the informal sector pretend to identify themselves as unemployed or inactive. This finding suggests possible overlaps between the status of unemployment on the one hand and other labour market statuses on the other hand, which have to be taken into consideration in order to adjust the officially calculated unemployment rate.

The size of informal economy in Macedonia both, as a percentage share of GDP and as a participation of the labour force, is relatively large compared with the more advanced transition countries. Moreover, by using various sources we have observed a rising trend in the share of informal sector since the beginning of transition. Taking into account the structure of Macedonian informal employment with a dominant share of employees without stable working contracts, we argue that high social security contributions rather than corporate tax is likely to be the main policy-induced factor for increased informal employment. The assessed socio-demographic structure of the informal employment based on LFS shows that males, those living in rural areas, the less educated and, prime aged workers are particularly likely to be informally employed. With respect to this, Macedonian follows the generally identified pattern of informal employment characteristics for less developed transition countries. In sum, the above findings taken together with the phenomena of declining participation rate and rising long-term unemployment, suggest that informal employment in Macedonia play an important role as a labour market adjustments mechanism. This and other relevant forms of labour market adjustment specific to SEECs will be together reconsidered in Chapter 7 with purpose to build the model of sustainable rate of unemployment.

CHAPTER 5

NON-PARTICIPATION AND THE LABOUR MARKET IN MACEDONIA

5.1 Introduction

After examining employment in the informal sector, in this chapter we further pursue our analysis of alternative forms of labour market adjustment in SEECs during the process of transition by an examination of non-participation. As already stressed in Chapter 1, the sharp fall in output at the beginning of transition was partly absorbed via increased unemployment and partly via increased non-participation, each of which exerting specific effects on the functioning of labour markets. Thus, the phenomenon of non-participation[28] can be identified as a particular type of labour market adjustment mechanism, which has emerged alongside other adjustments such as informal employment and emigration. However, due to the effect of 'discouraged workers' observed among the long-term unemployed, the distinction between unemployment and non-participation in depressed labour markets becomes blurred. Bearing in mind the above considerations, this chapter provides an assessment of the characteristics of labour inactivity in transition countries with an emphasis on

[28] In the existing literature the common synonyms for non-participation are the terms inactivity and out-of-labour force, which are here interchangeably used.

Macedonia. In particular, a reconsideration of the concept of attachment to the labour force is undertaken in order to evaluate the role of inactivity as a labour market adjustment mechanism.

In considering non-participation as a peculiar type of labour market adjustment mechanism and its possible policy implications a number of questions arise. How far can the existing theoretical concepts be used to explain the rising inactivity in transition countries? What are the trends of labour force participation and which labour force segments are more inclined toward inactivity during transition? To what extent do the characteristics of Macedonian inactivity resemble those generally observed in the transitional world? How has non-participation status contributed to absorbing the adverse economic shock at the beginning of transition and what are its interactions with other forms of adjustment? Finally, what are the budgetary consequences of increased non-participation and how should, if at all, the government respond in order to address these consequences?

With an aim to answer the above questions we pursue the following structure in this chapter. In section 5.2 we outline the main theoretical concepts related to labour force participation and inactivity. The main characteristics of non-participation in transition countries including their relationship with unemployment and possible consequences of increased non-participation are subject to analysis in section 5.3. Section 5.4 provides an analysis of the socio-demographic characteristics of the inactive population and possible determinants of the increased inactivity in Macedonia. In this context, we also consider the peculiarities of the labour market adjustment pattern and assess the fiscal impact of non-participation in Macedonia. Finally, section 5.5 contains our main concluding remarks.

5.2 Theoretical background

Before starting our empirical analysis of non-participation in transition countries, in this section we provide an overview of the main theoretical concepts regarding this phenomenon. In this context, we first present the factors identified in the literature as relevant to an individual's decision regarding labour force participation. In addition, we define the common measures of labour force participation and outline the classification criteria according to the adopted international standards for labour force participation.

5.2.1 Determinants of labour force participation

The micro foundations of labour supply in a given economy are based on analysing individuals' decisions regarding participation in the labour force. Generally, economists model the individual participation decision as based on responses to two sets of information (McConnell et al., 2003). The first set of information is subjective and consists of individual preferences for work over leisure. According to the labour-leisure approach, the individual will decide to work if the utility gain from work is higher than the disutility of working and forgone utility of leisure. We use the term leisure in the sense to include all kinds of non-market activities for which the person does not get paid. From this theoretical point of view, leisure and income from work are substitutes, where the marginal rate of substitution of leisure for income is defined as the amount of income one must give up to compensate for the gain of one more unit of leisure.

The second set of information is objective, expressed via the budget constraint. The wage at which one would decide to work is called the reservation wage, in which are incorporated all benefits that the unemployed or non-participants receive via the social transfers such as unemployment benefits, social assistance and so forth. As a consequence, in cases where the market wage is below the reservation wage, the individual will choose to be a non-participant. The raising of market wages above the reservation wage would induce the individual to look for a job *i.e.* to try to enter the labour force. The same effect would be exerted by decline in non-labour income.

The above basic labour supply model has been improved by several theoretical contributions such as the household supply model and life cycle allocation of time (Saczuk, 2004). According to the household supply model, decisions on the labour force participation are not taken independently, but rather jointly among the household members. In this case, the hours of work supplied by each household member can be a substitute or complement to the amount of work supplied by the other members. The concept of life cycle allocation of time has been developed in order to explain different levels of participation rates across age groups. Often, this approach is known as the dynamic labour supply model, which takes into consideration that an individual's decision between leisure and work is not a one

period decision. Therefore, a prime age worker whose opportunity cost of leisure is very high more frequently chooses to work and postpones leisure to later in the working life. This approach also helps to explain why decisions on whether to take additional schooling are more common among young and inexperienced workers whose opportunity cost of leisure is lower.

In the empirical as well as in the theoretical literature a number of factors have been identified that influence labour force participation. However, the most important ones in developed economies are business cycle variations, social security benefits, pension system, education, unemployment and poverty (Saczuk, 2004). First, the level of labour force participation varies according to the business cycle, since in each phase demand for labour is articulated in the general state of the economy. In this context, we *a priori* expect that in times of economic upturns a higher proportion of the population at working age will be induced to participate in the labour force, whereas the opposite is likely in the case of economic slumps. Second, the more generous social security benefits and pensions make non-participation status more attractive relative to participation in the labour force, thus exerting a negative effect on the latter. Third, increased average levels of education means increased investment in human capital, which *ceteris paribus* subsequently implies higher labour force participation among mature workers. Fourth, unemployment can also exert an impact on labour force participation with ambiguous outcome. High and persistent unemployment can increase non-participation via the 'discouraged workers' effect, which can be primarily observed among disadvantaged labour market segments (Chapter 1, section 1.4.3). In contrast, according to the 'added worker' effect some members of the household may decide to participate in the labour force if the primary wage earner is facing a high risk of unemployment (Wasmer, 2006). Finally, increased poverty coupled with insufficient social security benefits may force those who live under the poverty threshold to work or to look for jobs in order to support themselves and their families. In practice, the relative importance of the above-described factors varies across time and countries and may be accompanied by other idiosyncratic determinants that eventually result in a specific labour force participation rate.

5.2.2 Measurement and classification issues

The economically active population comprises all those of working age who are either employed or unemployed. According to the ILO standards, it is possible to make a distinction between the 'usually active population' and 'currently active population' (ILO, 1990). The 'usually active population' is measured in relation to a long reference period such as a year, whereas the 'currently active population' is measured in relation to a shorter reference period such as one week or one day. The latter category is also known under the term 'labour force'. Having in mind that the 'currently active population is unlikely to include the majority of the seasonal workers, we should consider the 'usually active population' as the more accurate indicator of short-term population activity, particularly in regions where a considerable part of the population is engaged in seasonal work such as agriculture.

The labour supply at the aggregate level is measured by the labour force participation rate, which can be expressed as a ratio between the actual and potential labour force. The term 'potential labour force' here refers to the 'non-institutional' population of working age, whereas the term 'actual labour force' refers to the currently active population (the relationship between these terms is clarified in Appendix 5.1). The non-institutional population includes all those who are not inmates of institutions (for example, penal and mental facilities, homes for the aged), and who are not on active duty in the Armed Forces. Furthermore, the aggregate labour force participation rate can be disaggregated for various population subgroups divided by gender, age or level of education in order to look more closely at the patterns of labour supply.

Persons not in the labour force, or the equivalent term 'population not currently active', comprise all persons not classified as employed or unemployed during the reference period. We can classify the population not currently active by reasons of inactivity into the following categories: (i) attendance at educational institutions, (ii) engagement in household production, (iii) retirement or old age, and (iv) other reasons such as disablement (ILO, 1990). Regardless the reason the inactivity status is ascribed to a given person, the estimated number of non-participants together with the number of participants represent the total number of potential labour force. Consequently, the labour force participation and non-participation rates sum up to one. Furthermore, ILO prescribes a set of priority rules

that are used in order to ensure that each person of working age is classified into only one of the three basic categories of the framework presented in Appendix 5.1. In this context, precedence is given to employment over unemployment and to unemployment over inactivity, which means that inactivity is made up residually of those without work, who do not seek and/or not available for work. These priority rules are useful in the cases where we have to deal with multiple activity situations, which are particularly relevant for labour markets in transition countries.

5.3 Non-participation in transition countries

The former socialist countries started the process of transition with relatively high labour force participation rates by western standards (Boeri, 2000). Generally their participation rates were significantly higher than those of the OECD countries due to the phenomenon of 'labour hoarding' defined in Chapter 1 (section 1.2). Producers were encouraged to create jobs regardless of the impact on overall productivity and labour force participation was encouraged by generous economic incentives such as: providing health insurance, childcare subsidies, and various types of social welfare for labour force participants. Participation in the labour force was even considered as obligatory, followed by persecution or social exclusion of those avoided employment (Boeri and Terrell, 2002; Mickiewicz, 2005). Subsequently, during the process of transition labour force participation has experienced significant changes, whose characteristics and consequences are subject of analysis in the remainder of this section.

5.3.1 Characteristics of non-participation in transition countries

One of the negative side-effects of the initial transitional shock was a reduction in the labour force, manifested in declining participation rates (Cazes and Nesporova, 2003; Bruno, 2005). Given the prevalence of 'labour hoarding', part of the reduction in the labour force can be viewed as a natural adjustment in activity rates following the collapse of the centrally-planned economic system. In the spirit of the flow approach to labour markets, a majority of the analysts of transition agree that flows from employment to out-of-labour force have been significant (Boeri and Terrell, 2002; Nesporova, 2002). This is also in accord with the findings from our analysis of labour market flows in Chapter 3 (section 3.3.3), which showed that flows

to inactivity generally exceeded the flows to unemployment. In order to illustrate the changes in participation rates during the first decade of transition in Table 5.1 we present corresponding figures for selected transition countries.

Table 5.1 Labour force participation rates in selected transition countries

Country	Participation rates 1990			Participation rates 1999		
	Total	Male	Female	Total	Male	Female
Bulgaria	75.0	77.7	72.2	70.2	75.9	64.9
Croatia	66.6	76.9	56.4	55.6	59.8	51.4
Macedonia	65.6	77.9	53.1	59.7	72.8	46.5
Romania	68.5	76.7	60.5	69.0	76.3	61.9
Russia	76.5	91.6	71.7	68.9	74.2	63.9
Czech Republic	78.1	82.2	74.1	72.4	80.3	64.4
Estonia	79.4	83.3	75.9	72.1	78.1	66.4
Hungary	65.4	74.5	57.3	59.9	67.8	52.3
Poland	72.5	80.1	65.1	66.1	72.8	59.7
Slovenia	70.7	76.7	64.8	68.0	72.2	63.3
Slovak Republic	78.3	82.5	74.2	69.3	76.1	62.6

Source: ILO, Bureau of Statistics

From Table 5.1 we notice that generally labour force participation rates decreased in almost all transition countries for both genders. According to Nesporova (2002) the reasons for the considerable fall in participation rates during transition can be classified into three basic categories: (i) voluntary withdrawals (e.g. persons who have been returned previously nationalised property and benefit from its rental income), (ii) semi-voluntary withdrawals (e.g. women on extended parental leave), and (iii) forced withdrawals (e.g. discouraged workers). The impact of initial recession on labour force participation has not been uniform across different group of workers. At this point we present empirical findings that illustrate how various segments of the labour force in transition countries face different probabilities of becoming non-participants.

First, in the majority of transition countries the female participation rates declined more than male rates. This finding is at odds with the secular trend of increasing female participation observed in OECD countries from the post World War II period (Jacobsen, 1999). The sharper decrease of female participation rates in most of transition countries can be attributed to the liquidation of institutions which existed under socialism, such as employer-provided child care facilities, that pushed many women with children from the labour force (Saczuk, 2004). In addition to the above-mentioned trend, Mickiewicz (2005) emphasises the impact of some

counterbalancing factors which caused female participation rates in CEECs to remain generally high. First, the new jobs were primarily created in the service sector employing mostly female labour, and second, the educational endowments of women in CEECs were generally higher compared to other middle-income countries implying a higher opportunity cost of their non-participation. It seems from our previous discussion in section 1.4.2 above that in the case of SEECs, these two factors do not play as important role as in advanced transition countries given that reallocation of labour mostly occurred from manufacturing sector to agriculture and low productivity services whilst the level of education amongst women on average was lower than that observed in the CEECs.

Second, the workers belonging to both tails of the age distribution are more affected by non-participation than prime age workers. The decrease in the participation rates of young workers can be explained by the more frequent extension of studies in post-compulsory education before entering labour market, partially induced by the low rate of job creation (Mickiewicz, 2005). Having in mind that returns to education in the market economy is higher than in the previous socialist system due to liberalisation of wage system, it was reasonable to expect rising rates of enrolment in post-compulsory education during the transition process (Cazes and Nesporova, 2003). The increased non-participation among older group of workers is due to various forms of 'bridging schemes', such as early retirement and disability pensions, that have accompanied the shedding of labour and imposed additional fiscal burden.

Third, less educated workers facing poor employment prospects are prone to experiencing the 'discouraged workers' effect and thus, exiting the labour force more frequently than workers with higher education. As we have seen in Chapter 1, the unemployment rate of workers with higher educational attainment is relatively low, which indicates that their employment prospects are superior to that of workers with lower levels of education. The previously mentioned high youth unemployment acts in direction of lowering opportunity cost for post-compulsory schooling, which strengthens the education incentives for this labour market segment. Alternatively, the increased inflow to education can also be attributed to skill mismatches between effective skills possessed by those completing compulsory schooling on the one hand, and employers' requirements on the other hand, resulting from the changing nature of the economic environment (Mickiewicz, 2005).

In sum, the analysis of the socio-economic structure of the population that has withdrawn from the labour force shows that increased non-participation has been more frequent amongst women, young workers and workers close to retirement as well as less educated workers (Allison and Ringold, 1996; Cazes and Nesporova, 2003; Mickiewicz, 2005). These findings indicate that roughly the same labour force segments, severely affected by unemployment are also inclined toward exiting the labour force, which supports our hypothesis about the existence of segmented labour markets in transition countries. As a consequence, by experiencing low outflow rates either from unemployment or inactivity we showed that these workers are frequently long-term unemployed and experience a 'discouraged workers' effect (Chapter 3). Moreover, alongside the possibility of exploiting various social transfers they are likely to embrace alternative coping strategies such as informal employment (Chapter 4).

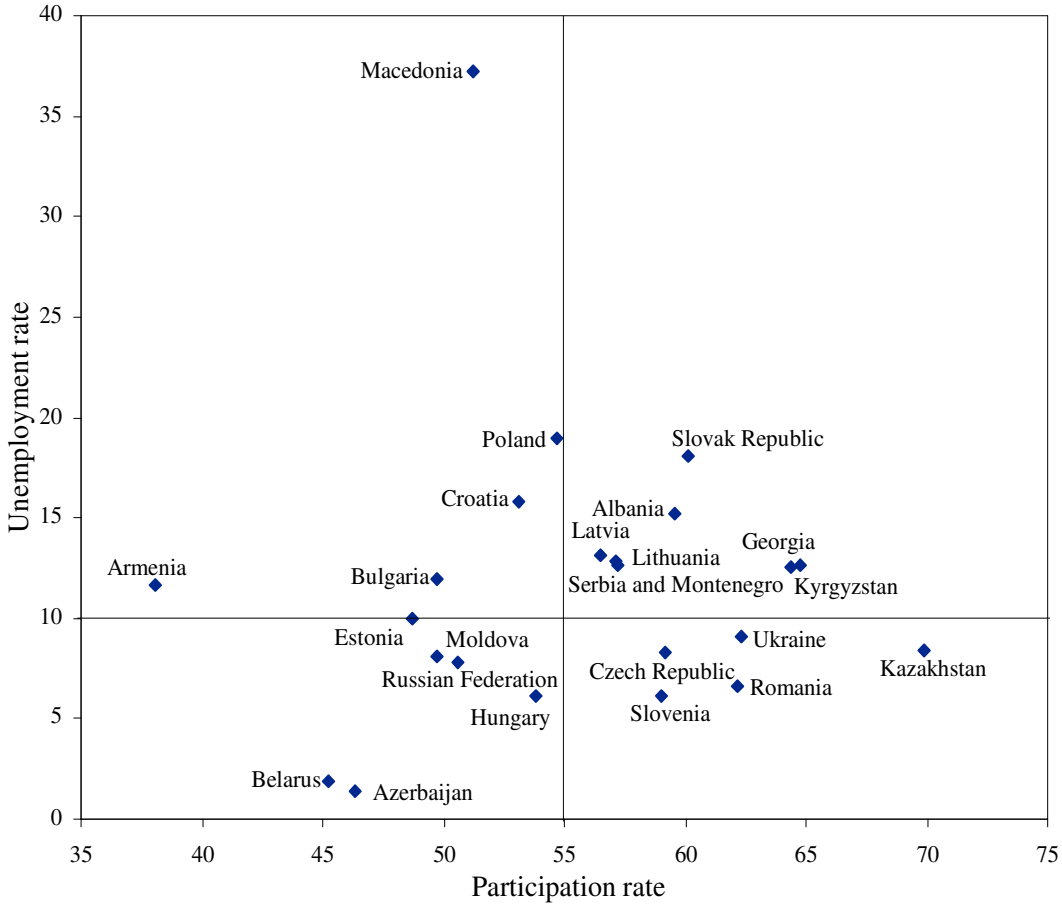
5.3.2 The relationship between non-participation and unemployment

As has been already stressed, non-participation in transition countries can be viewed as a form of labour market adjustment mechanism: an alternative to the open unemployment and other 'coping strategies'. In some transition countries the initial transitional shock was manifested in increased unemployment, whereas in others a sharp increase in unemployment was avoided due to the adoption of various social programmes (Nesporova, 2002). Often, these forms of labour market adjustment were undertaken in order to provide political support for transitional reforms. According to Mickiewicz and Bell (2000), the missing link in the cases where the sharp decline in employment at the beginning of transition did not translate into increases in unemployment, has been an expanding inactive sector, *i.e.* people withdrew from the labour force.

As a result of the differences in the policies adopted, transition countries significantly differ in their labour market outcomes which make it impossible to establish a strong relationship between the rate of unemployment and rate of participation. For instance, the Czech Republic has been an example of a country that initially successfully maintained high activity rates coupled with a low unemployment rate. Poland also maintained a relatively high activity rate throughout the process of transition, but with a much higher unemployment rate. Finally, Hungary is an

example of a transition country that avoided a sharp increase in its unemployment rate but at the expense of a large outflow of workers from the labour force. Transition countries can be located in the unemployment/participation space according to the estimated unemployment and labour force participation rates. This cross-country analysis for 2003 is illustrated in Figure 5.1. For convenience, on the vertical axis we distinguish between the countries with low and high unemployment rates, whereas on horizontal axis we distinguish between countries with low and high participation rates respectively.

Figure 5.1 Relationship between participation and unemployment in transition countries



Source: ILO, LABORSTA

It may seem that the most desirable labour market outcome in Figure 5.1 is the lower right hand quadrant where a low unemployment rate is coupled with high participation. However, among the countries that achieved this combination only Czech Republic and Slovenia are examples of successful transition countries, whereas Ukraine, Kazakhstan and Romania are still lagging in the process of structural reforms. The latter group consists of mostly less developed transition countries, where high participation rates are induced by rising poverty which pushes a large part

of population into subsistence farming and other forms of low productivity employment (Saczuk, 2004). As a consequence, these countries maintained fairly stable participation rates, and some of them, such as Romania, even managed a slight increase during the first decade of transition. Taking into account that subsistence agriculture is often associated with an erosion of skills or their replacement with skills which are not valued in the new economic system, some authors argue that open unemployment may be a socially superior outcome (Mickiewicz, 2005). Belonging to the upper left quadrant, Macedonia is characterised by an extremely high unemployment rate coupled with low participation, a unique pattern we analyse below in section 5.4.3.

5.3.3 Consequences of increased non-participation in transition countries

As demonstrated in Chapter 1, the emergence of open unemployment was accompanied by a number of negative social consequences that encouraged governments in transition countries to adopt various strategies in order to mitigate the problem. These strategies differed in their impact upon labour market behaviour and the outcomes achieved. For example, the former Soviet Union countries postponed reforms by encouraging labour hoarding, whereas the majority of CEECs introduced various schemes for early retirement or disability pensions (Svejnar, 1999; Saczuk, 2004). In most transition countries, early retirements comprise those workers accepting old-age retirement pensions who are five years under the official retirement age (Allison and Ringold, 1996).

However, the removal of older workers from employment often resulted in a mismatch between the characteristics of the newly-released jobs and the skill/experience characteristics of the labour supply. Thus, these measures did not solve labour market and social problems but just transferred the problem from the domain of unemployment to the domain of non-participation (Mickiewicz, 2005). Moreover, the need for differentiation between unemployment and out-of-labour force status arises from the different fiscal impact of these two labour market categories on the government budget. The fiscal burden of increased non-participation is even higher, having in mind that unemployment benefits are time limited, whereas the out-of-labour force entitlements such as early retirement schemes or disability pensions are often open-ended. Although the beneficiaries from

these 'bridging schemes' eventually qualify for normal old-age retirement pensions, given the low and falling duration of unemployment benefits we argue that their fiscal impact is deeper than the impact of the unemployment benefits (Chapter 1, section 1.5.3).

Despite the fact that early retirement schemes have to some extent contributed to the stabilisation of unemployment in transition countries, they negatively influence the system's dependency ratios[29] which have risen as a result of the large inflows into non-participation. In OECD countries the impact of the policy-induced early retirement was compounded by the secular trends of ageing population and has been widely documented and well understood (e.g. Herbertsson and Orszag, 2003). However, the fiscal implications of these recent changes in transition countries, manifested in declining employment and increased non-participation as well as associated with western-like demographic transitions, have still not been fully explored. The sharp increase in system dependency ratios in CEECs during the first phase of transition is illustrated in Table 5.2.

Table 5.2 System dependency ratios in selected transition countries

Year	Poland	Slovak Republic	Czech Republic	Hungary
1990	43.6	44.2	55.2	53.3
1991	51.8	52.5	59.2	57.4
1992	57.9	53.1	61.6	66.0
1993	60.9	55.3	63.0	74.2
1994	61.6	56.2	62.5	79.3
1995	60.7	54.6	61.0	82.0
1996	61.2	53.4	60.5	83.9

Source: Schrooten et al. (1998)

From Table 5.2 it is clear that after an initial sharp increase, system dependency ratios stabilised as transition entered the more mature phase, with Hungary being an exception. The case of Hungary is an instructive example of the far-reaching implications of policies that favour the substitution of unemployment with non-participation. The increased dependency ratios caused fiscal imbalances which negatively affected the financing of transitional reforms. Even though, by increasing the number of inactive beneficiaries governments may gain some political support for undertaking or pursuing the economic reforms, policies that slow down

[29] The system dependency ratio is defined as a ratio of the number of beneficiaries to the number of contributors to social security and pension funds.

the flows into unemployment in the long-run have often turned out to be inefficient and unsustainable (Mickiewicz, 2005). Thus, before undertaking any new policy measures, governments should carefully examine their possible longer-term labour market and budgetary implications.

In order to fully assess the impact of decreasing labour force participation rates in transition countries we have to be aware of the global demographic trends. Most of the countries since the beginning of transition, alongside with the structural reforms have experienced a deep demographic transition (Svejnar, 2002a). Changes in life expectancy vary from increased longevity in CEECs and Baltic countries, remaining about the same in SEECs and a decline in most of the CIS countries. In addition, fertility expressed as the number of births per women declined in almost all transition countries. Therefore, we expect that the combination of declining participation rates, increased longevity and falling fertility rates will in the long run have even stronger negative fiscal implications for SEECs, similar to those currently observed in many developed OECD countries.

5.4 Non-participation in Macedonia

We now proceed with our study of the characteristics and determinants of labour force participation in Macedonia in order to detect similarities and differences with the general pattern in other transition countries outlined above. According to the general overview of the trends in Macedonian labour market presented in section 1.4.1 we can distinguish two phases in the evolution of labour force participation. The first period, 1990-1995 was characterised by a substantial drop in the labour force participation, whereas the second period from 1996 up to the present, is marked by a stable participation rates. Nowadays, the rate of labour force participation in Macedonia is comparable to other countries in the region, although it is still low by the standards of developed market economies (World Bank, 2003).

5.4.1 Characteristics of non-participation in Macedonia

In order to assess the characteristics of the Macedonian inactive population we separately consider various socio-demographic aspects such as gender, age, education and place of living (urban/rural). According to the Macedonian Statistical Office, the labour force participation rate is defined as the rate of participation in the total

population at working age between 15 and 64.[30] The evolution of the labour force participation rates, including total and disaggregated by gender during the period 1996-2005 is presented in Table 5.3. For this purpose we use the officially published data from Macedonian LFS, for the period prior to 1996 we are again deprived of detailed analysis due to the lack of data.

Table 5.3 Labour force participation rates in Macedonia

Year	Labour force participation rate	Male Participation rate	Female Participation rate
1996	54.9	66.9	42.9
1997	53.7	66.5	41.2
1998	54.8	67.4	42.2
1999	53.1	65.5	40.8
2000	52.9	64.4	41.7
2001	55.5	65.6	45.5
2002	52.6	63.7	41.5
2003	54.5	65.6	43.4
2004	52.2	63.5	40.9
2005	55.3	65.8	44.8

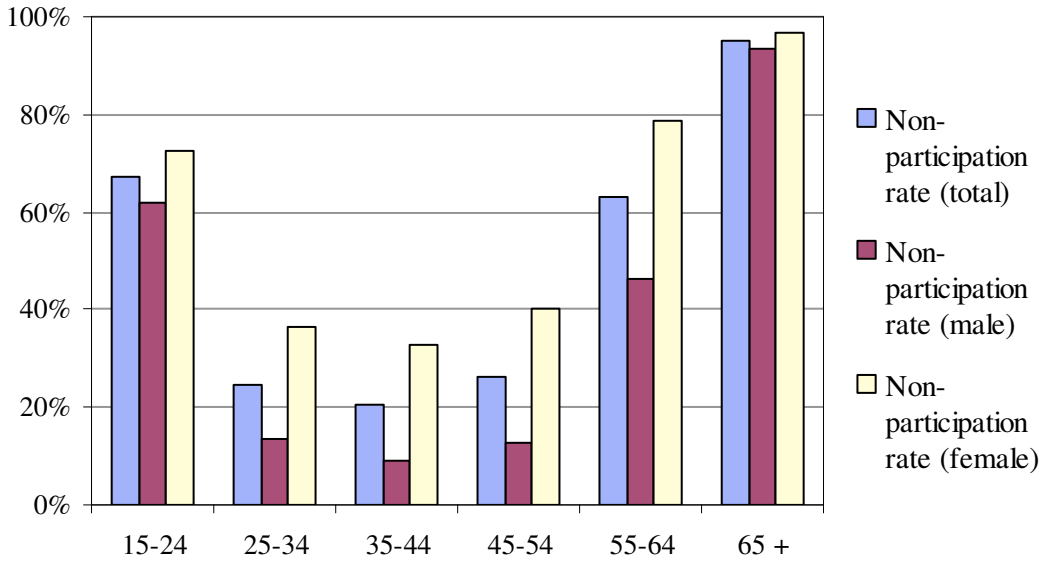
Source: Macedonian Statistical Office, LFS 1996-2005

From Table 5.3 we note that the male labour force participation rate is higher than the female participation rate. The male participation rate varies within the range 63.5 percent and 67.4 percent, while the female participation rate varies in the range between 40.8 percent and 45.5 percent. The recent differences between male and female participation rates in Macedonia have been fairly stable, without any widening of the gap in favour of male participation. In addition to the factors that cause a lower female participation rates in transition countries elaborated in section 5.3.1, we have to mention increased informal employment. As explained in section 4.3.2 above, this type of employment does not provide social security benefits such as maternity benefit and child care allowance which suggests that it is less attractive to the segment of the female population consisting of potential mothers, again leading to their lower participate in the labour force.

Second, the analysis of age structure of economically inactive population shows that inactivity is extremely age sensitive in Macedonia. In order to illustrate this in Figure 5.2 we present the non-participation rates in 2005 disaggregated by age.

[30] These age limits are adopted according to the European Statistical Bureau (EUROSTAT).

Figure 5.2 Non-participation rates by age in Macedonia

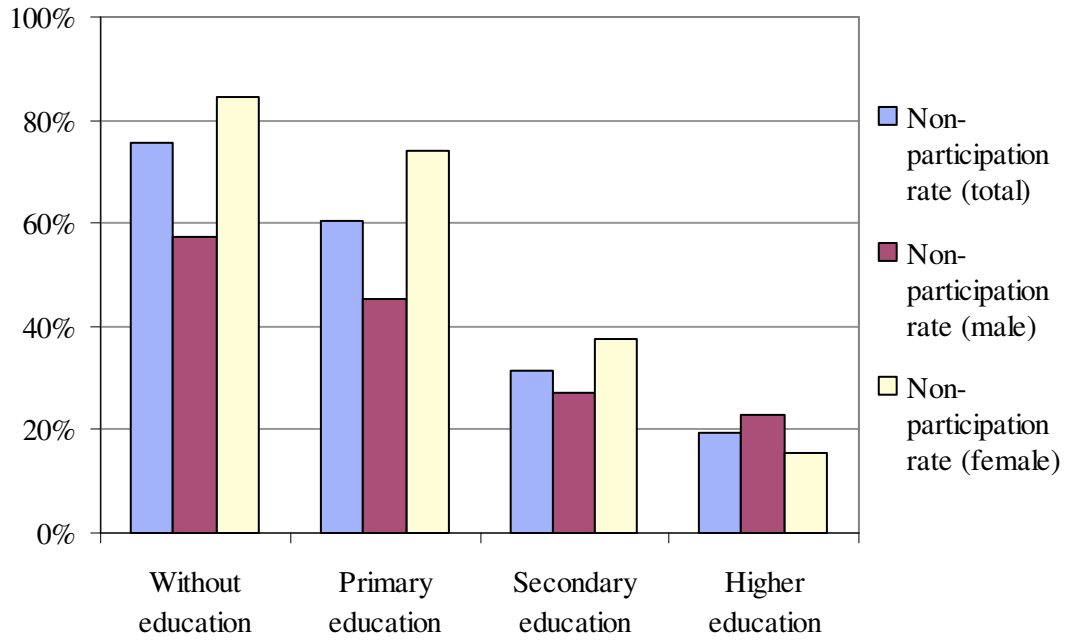


Source: Macedonian Statistical Office

According to Figure 5.2 the distribution of non-participation rates by age is U-shaped. The oldest age group (65 and above) have the highest non-participation rate, approximately 95 percent, followed by the youngest group (15-24), which experience about a 65 percent rate of non-participation. It is also worth noting that for all age groups female non-participation rates are higher than those of male, but the distribution of female non-participation rates by age groups is flatter than the distribution of male non-participation rates. For instance, at the tails of the age distribution the male and female non-participation rates are close, whereas in the middle range the male non-participation rates are much lower than female non-participation rates. According to these findings and those in the previous chapters, prime age male workers represent the most advantaged labour market segment in Macedonia since alongside the lowest rate of non-participation they face among the lowest rates of unemployment (section 1.4.3) and the lowest probability of exiting the labour force (section 3.4.4).

Third, analysis of the structure of non-participants by the level of educational attainment shows that the rate of non-participation continuously decreases with the level of education. The distribution of Macedonian non-participation in 2005 by level of completed education is illustrated in Figure 5.3.

Figure 5.3 Non-participation rates by level of education in Macedonia



Source: Macedonian Statistical Office

According to Figure 5.3, the highest rate of non-participation (about 74 percent) is experienced by workers who did not complete primary education, whereas workers with higher education are the least likely to be non-participants (experiencing about 21 percent likelihood of being classified as such). It is striking that the gap between male and female non-participation rates continually diminishes with the level of education. Indeed, women who have undertaken higher education have a lower probability of being non-participants than their male counterparts. This suggests that although inactivity rates are generally higher for women mainly due to childbearing and time spent looking after their family, this is a less significant reason for inactivity for those who are highly educated due to the graduate wage premium. If we compare these findings with the distribution of unemployment rates by level of education (Chapter 1, section 1.4.3), we notice a similar pattern, indicating a pronounced co-existence of unemployment and non-participation within the same labour market segments.

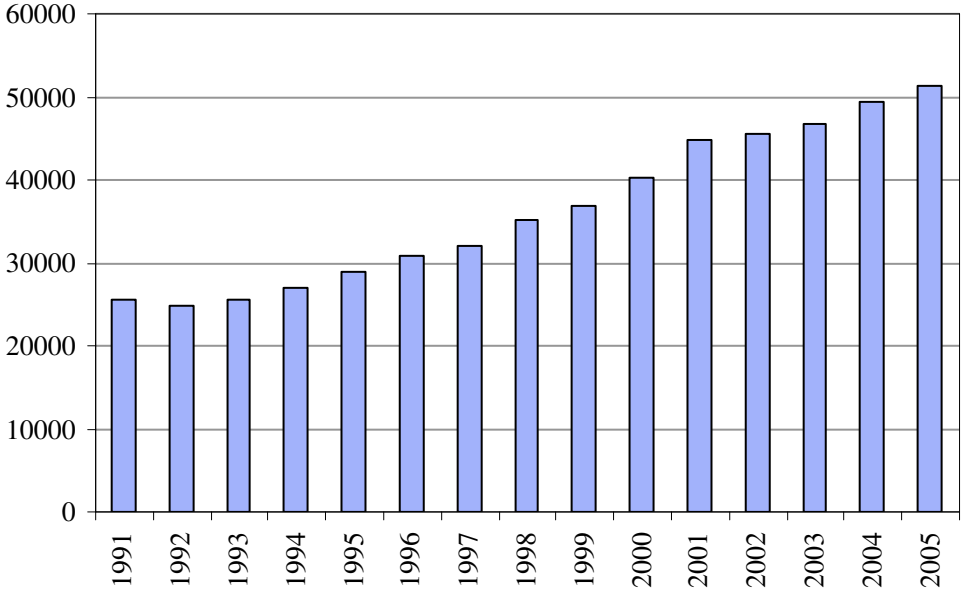
Finally, disaggregating non-participation between urban and rural populations in Macedonia revealed a small difference in favour of higher participation amongst the urban population. For instance, the rural inactivity rate in 2005 was 50.7 percent, whereas the urban inactivity rate was only 42.7 percent. This gap originates in the

significant discrepancy between female inactivity rates, whereas the corresponding male inactivity rates for both demographic segments are about 35 percent. The distributions of non-participants for urban and rural population by age and level of education show similar patterns as those generally observed in Figure 5.2 and Figure 5.3, reflecting the overall depressed characteristics of the Macedonian labour market.

5.4.2 Determinants of non-participation in Macedonia

Having in mind the long-lasting economic recession in Macedonia, we can argue that macroeconomic determinants as likely to be mainly responsible for low participation rates. However, not all labour market segments are equally affected by the economic recession. In this context, we provide some insights into the possible reasons why some group of workers are more affected by non-participation than others as well as the eventual side-effects from increased non-participation. Due to the lack of individual data we are not able to perform econometric analysis, necessitating the use of published data from the LFS. The greatest decline in labour force participation rates was observed among the two youngest group of workers (15-19 and 20-24) from 23.8 and 64.9 percent respectively in 1996 to 14.5 and 50.9 percent in 2005. The high inactivity among these groups of potential workers, as found in most other transition countries has been related to the rising trend of enrolment in post-compulsory, and particularly in higher education, since the beginning of 1990s (Mickiewicz, 2005). As we have seen in Chapter 1 (section 1.4.1), the number of students in higher education in Macedonia doubled from around 25000 in 1991 to over 50000 in 2005. In order to illustrate the rising trend in post-compulsory education in Figure 5.4 we show the number of students in higher education for the period 1991-2005.

Figure 5.4 Number of students in Macedonian higher education



Source: Macedonian Statistical Office

The increased continuation of schooling after completion of compulsory primary or secondary education may be attributed to several factors. The poor employment prospects that face young inexperienced workers induced more Macedonian youths to enroll in university education instead of looking for jobs after completion of secondary education (Mojsoska, 2006). The relatively low opportunity cost of higher education in Macedonia made the extension of education feasible for an increased proportion of qualified school-leavers. In addition, the increased diversity of post-compulsory education after the creation of a number of private universities and high schools may have induced increased interest in education among population across a variety of social backgrounds.

On the other side of the age distribution, we observe two off-setting effects among the oldest group that significantly influence their labour force participation. On the one side, older workers that gained a narrowly specialised vocational education under the socialist regime were likely to become less attractive, with respect to the quality of their human capital, compared to the entrants with a broader education more appropriate for a competitive market economy. Therefore, their relatively lower attractiveness may be considered as a reason for their relatively higher non-participation rate already documented in the previous section. Additionally, workers that were laid-off from the previously state-owned enterprises

were frequently offered early retirement schemes or disability pensions as alternative ways of exiting the labour force before qualifying for normal old-age pension. This early retirement as a 'bridging scheme' was introduced even before the start of transition and lasted until the end of 1993, when the new 'Law for Pension and Disability Insurance' entered in force.

On the other side, since 1994 the gradually rising age requirements for acquiring eligibility for an old-age pension operated as significant attractors of the older workers to remain in the labour force. For instance, the required age limit for men increased from 60.5 in 1994 to 64 in 2001, whereas the age limit for women increased from 55.5 in 1994 to 62 in 2007. As a consequence, the participation rates of the older groups of workers (55-59 and 60-64) significantly augmented from 37.5 and 16.3 percent respectively in 1996 to 47.9 and 23.4 percent in 2005.

Finally, the relatively high non-participation rate of workers with low educational attainment can be attributed to the unfavourable combination of their low level of human capital and insufficient demand for this type of labour. As a consequence, the less educated workers have been more frequently affected by chronic joblessness and forced to exist on various social transfers or resort to informal employment. Taking into account the characteristics of informal employment assessed in Chapter 4 (section 4.4.3), we can conclude that these workers are most likely to be assigned to the category 'shadow inactivity' *i.e.* to both labour market adjustment mechanisms: inactivity and informal employment that we disentangle in the next section.

5.4.3 Assessment of the adjustment pattern in Macedonia

In order to analyse the relationship between unemployment and non-participation as alternative labour market adjustment mechanisms we follow the approach of Blanchard (1997). As in Chapter 3, we use the symbols *E, U* and *O* for the three basic labour market states: employment, unemployment and out-of-labour force respectively. We simplify the analysis by assuming that the initial transitional shock in domestic labour market can be adjusted either through increase of unemployment or increase of non-participation. Furthermore, ΔE, ΔU and ΔO are used to denote the changes in absolute numbers of workers in each of the basic labour

market states with respect to the year, which represents the start of transition. Thus, for the change in the total number of working age population (ΔP) we have:

$$\Delta P \equiv \Delta E + \Delta U + \Delta O \quad \ldots (5.1)$$

In order to determine which of the above adjustment channels dominates in the labour market, we can express the ratio x which is calculated as follows:

$$x = \frac{\Delta U}{\Delta P - \Delta E} = \frac{\Delta U}{\Delta U + \Delta O} \quad \ldots (5.2)$$

This ratio obtains the maximum value 1 if the entire adjustment has been carried out through unemployment rather than non-participation and its value approaches 0 if adjustment has mostly occurred through non-participation. According to Blanchard (1997), the x ratio at the beginning of transition varied within a wide range demonstrating the previously analysed differences in adjustment patterns across countries. For example, the value of x ratio was lower for the Czech Republic (0.27) and Hungary (0.41), whereas it took higher values in the cases of Bulgaria (0.75) and Poland (0.85). Our calculated values of the x ratio for Macedonia are presented in Table 5.4, where 1996 is the baseline year *i.e.* the year when the LFS was introduced.

Table 5.4 Calculated x-ratios for Macedonia

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005
x ratio	0.47	0.50	0.13	0.12	0.21	0.11	0.48	0.33	0.51

Source: Own calculations based upon data from the Macedonian Statistical Office, LFS 1996-2005

From Table 5.4 we observe that 1997-1998 was a period of mixed adjustment, followed by 1999-2002, where adjustment was predominantly carried out via non-participation. This period coincides with the economic recovery associated with a smaller increase in unemployment relative to the increase in non-participation. It seams that since 2003 adjustment has again turned into the balanced path between unemployment and non-participation. These findings correspond to the identified placement of Macedonia in the unemployment/participation space *i.e.* in the upper left hand quadrant of Figure 5.1. Consequently, its low participation coupled with high unemployment rate confirms the hypothesis that non-participation and unemployment in Macedonia can be considered as complements rather than substitutes.

Previous empirical analyses of depressed labour markets emphasise the difficulty in drawing a clear distinction between the unemployment and non-

participation (Jones and Riddell, 1998; Wasmer, 2006). This arises from the heterogeneity of the non-participation status and existence of various degrees of attachment to the labour force. For instance, certain labour market segments classified as inactive can be considered to be more attached to the labour market than others, as in the case of so-called 'waiting' group of workers. This group of workers would look for jobs if the demand side of the labour market improves. As a consequence, particularly workers with low level of education are trapped in the vicious circle of low skilled employment, unemployment and inactivity, which suggests the need for policy measures to improve their employment prospects.

The sharp increase in the non-participant population can be viewed as an indication of distortions in the Macedonian labour market. Taking into account that the reservation wage in the formal employment is much higher than the reservation wage in the informal employment, due to the payroll tax and social security contribution, we assume that non-participants are more inclined toward informal employment arrangements. This is consistent with the previous findings that workers with the lowest level of education and poor human capital endowments face the highest probability of becoming non-participants or embracing informal employment (Chapter 4, section 4.4.3). With this in mind, given the extremely high non-participation rate in Macedonia, we argue that inactivity status is coupled with other labour market adjustment mechanisms *i.e.* a considerable number of the LFS non-participants may actually be informally employed. Consequently, the level of non-participation in Macedonia may be overestimated due to the false declaration as non-participants of the LFS respondents who are in practice informally employed.

5.4.4 The fiscal impact of non-participation in Macedonia

As we have previously argued, social programmes that favour non-participation over unemployment have to be carefully planned, with their fiscal implications being fully assessed. In order to examine the fiscal impact of increased non-participation in Macedonia we track the evolution of pensions and associated expenditures. We do not tackle some technical aspects such as the mode of financing and management of the pension system, since these issues exceed the scope of our analysis. The trends in the number of disability and old-age pensioners as well as expenditures on these pensions are presented in Table 5.5.

Table 5.5 Number of disability and old-age pensioners in Macedonia

Year	Number of disability pensions	Expenditures on disability pensions (in million denars)	Index of expenditures on disability pensions	Number of old-age pensions	Expenditures on old-age pensions (in million denars)	Index of expenditures on old-age pensions
1996	47431	2740.01	100.0	117041	9155.24	100.0
1997	48909	2869.49	104.7	118148	9410.66	102.8
1998	51208	3178.59	116.0	119194	9900.31	108.1
1999	52060	3234.20	118.0	120574	9899.99	108.1
2000	52549	3617.65	132.0	124210	11040.39	120.6
2001	52619	3912.39	142.8	128322	11939.88	130.4
2002	52514	4101.51	149.7	129648	12540.76	137.0
2003	52237	4196.45	153.2	133008	13291.14	145.2
2004	51589	4119.00	150.3	137840	14538.00	158.8

Source: Statistical Yearbook of Macedonia, 2003 and 2005 and author's calculations

From Table 5.5 we notice that although the number of beneficiaries of disability pensions in Macedonia has recently stabilised, the expenditures on disability pensions have continued to rise, imposing further budgetary pressures. Over the period 1996-2004 the expenditures on disability pensions on aggregate level increased by more than 50 percent, whereas expenditures on old-age pensions increased by almost 60 percent. The rising expenditures on pensions alongside other social transfers have been considered as a part of a broader national social strategy for poverty alleviation (World Bank, 2005). In this context, the World Bank estimates show that over half of the population benefits from at least one social protection transfer including pensions. Therefore, pensions are important not only because they mitigate old-age poverty, but also support other family members especially among the poor.

The demographic trends in Macedonia during the same period of consideration show a slightly increased longevity coupled with pronounced fall in the fertility. Taken together with the above-illustrated increase in non-participation these demographic trends are an additional factor that has caused increased fiscal pressures. We assess the fiscal implications of the increased non-participation in Macedonia by calculating the system dependency ratio. The number of contributors (employed and self-employed) and beneficiaries (pensioners and recipients of social assistance) as

well as the corresponding system dependency ratios over the period 2000-2004 are presented in Table 5.6.

Table 5.6 Number of social security contributors and beneficiaries in Macedonia

Category		2000	2002	2004
Social security contributors	Employed	443628	425594	402900
	Self-employed	14622	13244	12578
Social security beneficiaries	Recipients of pensions	255966	283477	281594
	Recipients of social assistance	5820	6575	6006
System dependency ratio		57.1	66.1	69.2

Source: Statistical Yearbook of Macedonia, 2003 and 2005 and author's calculations

From Table 5.6 is noticeable that the number of contributors over the period 2000-2004 has continually fallen. In this context, the patterns are similar for both categories of employed and self-employed. In contrast, the number of social security beneficiaries shows an increasing trend between 2000 and 2002 followed by subsequent stabilisation in 2004. These changes exerted negative fiscal effects in terms of increased system dependency ratio from 57.1 in 2000 to 69.2 in 2004. Comparing this with the figures presented in Table 5.2 demonstrates that the Macedonian system dependency ratio is close to those of more advanced transition countries in the first phase of transition. Although with a certain time-lag, Macedonia has experienced the same consequences of increased non-participation as the advanced transition countries.

5.5 Conclusion

The initial transitional shock has been absorbed via number of adjustment mechanisms. The decline in labour force participation rates alongside the rise of unemployment represents the most important characteristic of transitional labour markets. The drop in participation rates was specific to particular groups of workers such as females, young workers and those close to the retirement age and, has been closely related to availability of social programmes that favour the inactivity status over unemployment. Thus, the phenomenon of non-participation can be viewed as a particular form of labour market adjustment mechanism.

However, transition countries experienced various labour market outcomes with respect to the unemployment/non-participation nexus. The transition countries that successfully maintained high participation rates have faced a lower cost of

transitional transformation. In contrast, dependency ratios dramatically rose in those countries where non-participation rates significantly increased relative to unemployment, thus imposing additional fiscal burden. Therefore, increased non-participation cannot be considered as a solution to the social problem engendered by the initial transitional recession since the unanticipated fiscal burden has jeopardised the successful achievement of the transitional process in some countries.

The Macedonian labour market shares with other transition countries a number of common points regarding the trends and characteristics of non-participation. First, women are more inclined to be non-participants then men. Second, the youngest and the oldest groups of workers face the highest probability of being non-participant. Third, the rates of non-participation decrease with the level of education: workers with lower levels of education face a higher probability of becoming non-participants compared to those with higher educational attainment. Having in mind the increased fiscal burden from inactivity and unfavourable demographic trends in Macedonian labour market we propose the substitution of policies that favour non-participation with those that enhance employability and participation. In order to increase the labour force participation rates, effective policy measures should target those segments of the labour market, which are the most concerned by this problem.

The high Macedonian non-participation rate suggests the need for a reassessment of the accuracy of officially published labour market figures. First, the false assignment of a large fraction of 'discouraged workers' may inflate both unemployment and non-participation rates. Second, there exists the possibility of an overlap between non-participation and other forms of labour market adjustment. The existence of so-called 'shadow inactivity' comprising *de facto* informally employed workers that declare themselves as non-participants, indicates that in transition countries there is no a strict borderline between the non-participation and informal employment. Furthermore, the actual size of non-participation should be reassessed by taking into account the high emigration rates in SEECs, since those who have emigrated should not be counted in the working age population of the domestic labour market.

CHAPTER 6

EMIGRATION AND THE LABOUR MARKET IN MACEDONIA

6.1 Introduction

In this chapter we continue our analysis of the less conventional forms of labour market adjustment induced by the depressed characteristics of SEECs labour markets manifested in low job creation in the formal sector and a long average duration of unemployment. Alongside employment in the informal sector assessed in Chapter 4 and increased non-participation examined in Chapter 5, emigration has become a prominent way to escape unemployment in a number of transition countries. In this chapter we bring to the fore the role of emigration from transition countries as a labour market adjustment mechanism and its consequences for domestic labour market performance. Again, as in the case of the previous analyses we put an emphasis on the experience of the South-East European region and provide a more detailed analysis of Macedonian emigration.

In order to achieve the above aims, at the beginning of this analysis we address a number of questions which deserve our further attention. Which theoretical framework is the most appropriate for the analysis of emigration in transition countries? What are the possible determinants as well as the likely outcomes from

increased emigration from transition countries? Does Macedonian emigration share the same characteristics as those observed in other transition countries, or it is characterised by some peculiarities? What are the amount of remittances to transition countries, and particularly Macedonia and, what impact do they exert on economic development and growth? Finally, what are the possible policy implications regarding the regulation of emigration and channelling of remittances into appropriate uses?

The strategy that we pursue in this chapter has been chosen to provide answers to the above questions. For this purpose, in section 6.2 we first elaborate the theoretical background including the classification, determinants and consequences of migration. In this context, we also provide a rationale for studying the determinants and implications of remittances. The empirical evidence for emigration from transition countries and the respective impact of remittances is presented in section 6.3. In section 6.4 we analyse the empirical evidence regarding the characteristics and determinants of Macedonian emigration including the role of remittances. Finally, in section 6.5 we offer concluding remarks and outline some initial policy implications of our analysis.

6.2 Theoretical background

Migration as a social phenomenon has existed throughout human history, but recently it has attracted increased attention from social scientists and policy makers. Among the number of definitions, the most generic one emphasises migration as an act of changing location from one place to another (Jennissen, 2003). In our analysis we distinguish between migrant flows and stocks, the former indicating the number of migrants during a certain period of time, whereas the latter referring to total number of migrants in a given country. Before starting the empirical analysis of emigration as a particular labour market adjustment mechanism in transition countries, we present some theoretical background concerning classification, determinants and consequences of migrations.

6.2.1 Classification of migrations

The complexity of a relationship between migratory movements and the socio-economic development entails differentiations between various forms of migration that can be classified from different aspects. According to the spatial

criterion, there are two forms of migration: internal and international. Internal migration represents all reallocations of population within a given country, whereas international migration represents the movements between different countries. In this chapter we are primarily concerned with international migration, which can be viewed as particular labour market adjustment mechanism different from the internal geographical mobility. From the point of view of migration duration, two forms of migration can be distinguished: temporary and permanent. Temporary migration is related to a limited duration and usually has been known as return migration. Permanent migration in turn, is related to the unlimited duration of dislocation and has been considered as a one-way process of movement. Regarding temporary migrations, some authors distinguish between short-term and long-term migrations, each of which having different socio-economic implications (IOM, 1998). In addition, as separate forms we can differentiate seasonal migration related to specific economic activities and repeat migration where workers repeatedly emigrate and return in the home country during a given period.

Within the conceptual framework of international migration, it is necessary to make a distinction between the source country or country of origin and the receiving country or country of destination. Alternatively, in the case of temporary migration we respectively use the notions home and host countries. According to the United Nations Recommendations on Statistics of International Migration, the country of usual residence is defined as the country in which a person lives, that is, the country in which he or she has a dwelling where he or she normally spends the daily period of rest. Temporary travel abroad for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage does not change a person's country of usual residence (UN, 1997). According to the above classification, the long-term migrant is defined as a person who moves to a country other than that of his or her usual residence for a period of at least a year, whereas short-term migrant is defined as a person who moves to a country other than that of his or her usual residence for a period of less than a year.[31] For the purposes of international migration statistics, the country of usual residence of short-term migrants is considered to be the country of destination during the period they spend there.

[31] Exceptions to this definition are cases where the movement is for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage.

6.2.2 Determinants of emigration

There exist a number of theories emphasising different potential determinants of migration. Some authors distinguish between factors that cause emigration from a given country, which are often called 'push' factors, and factors that cause immigration into a given country, or 'pull' factors (Bauer and Zimmermann, 1999). These theoretical approaches to international migration can be divided into two categories: theoretical approaches explaining the initiation of migration and theoretical approaches explaining the continuation of migration (Jennissen, 2000).

The determinants that are most frequently used in theoretical elaboration of migration movements are differences in employment prospects and wage rates between home and destination country. According to the neo-classical theory, migrations arise as a result of wage differentials between regions or countries. Thus, one can expect, in a world of no regulation of migration, that a large real wage difference would cause intense migratory flows (Bauer and Zimmermann, 1999). In terms of net migration flows, a relatively high real wage has a positive effect on net migration flows into labour importing countries, but negative effect on net migration flows from labour exporting countries (Jennissen, 2003). However, in a dynamic model where emigrants choose their optimal migration duration, a host country wage increase may either increase (relative wage effect) or decrease (income effect) migration duration. Therefore, the prevailing of the above two counteracting effects will determine the eventual impact of a wage increase on migration duration (Dustmann, 2001).

In addition to wage differentials, the generosity of the welfare state and corresponding eligibility may also play an important role as an attractor of immigrants. Since immigrants face a probability of becoming unemployed, they have to take into account this information when make migration decisions. According to the 'welfare magnet' concept, potential legal migrants are more likely to move to countries with more generous welfare programmes (Pedersen et al., 2004). Furthermore, destination countries with relatively high unemployment benefits and relatively evenly distributed incomes are more attractive to risk-averse individuals, while the opposite is true for risk neutral and risk-loving individuals (Heitmueller, 2002).

The human capital theory provides an explanation of migratory movements as an investment in human capital. Since, migration decisions represent an investment in human capital, potential migrants weigh up the discounted present value of their earnings and costs from moving abroad. According to this point of view, other things being equal, the likelihood of permanently emigrating decreases with age because the discounted present value of the older workers' earnings is smaller than that of younger workers.

Keynesian economic theory considers migration movements as a form of equilibrium adjusting mechanism in labour markets. In other words, the determinants of migration movements are more likely to be unemployment differences rather than wage differences. Consequently, in terms of net migration flows, relatively high unemployment has a negative effect on net migration flows into labour importing countries, but a positive effect on net migration flows from labour exporting countries (Jennissen, 2003).

Among the other 'push' economic factors of migration is a high level of poverty in the country of origin. However, a high level of poverty may impose financial constraints on potential emigrants, which implies a lower rate of emigration from the poorest regions. Thus, one can expect an inverse U-shaped relationship between the income level and emigration (Bauer and Zimmermann, 1999; Hatton and Williamson, 2003). In addition, Rotte and Vogler (1999) present several additional arguments that help to explain the inverse U-shaped relationship between development and migration: population growth, changes in domestic society, improved transport and communications and expanding networks. These factors would lead to increased emigration in the short and medium run, but in the long run, potential income convergence and home preference would cause migratory movements to fall.

Apart from the above-mentioned theoretical approaches that seek to explain migration movements there are other determinants such as geographic, demographic, cultural, political, social and so forth. They are often considered as complements to the above theoretical frameworks. For instance, the proximity of receiving and sending countries can substantially lower the cost of migration and thus initiate a higher rate of migration. Demographic structure of the population in the source and destination countries is also considered as a factor that determines migration movements (Fertig and Schmidt, 2000). In this context, countries with a younger

population and relatively unfavourable economic conditions are more likely to become net exporters of labour. The opposite is true for countries with an older population and better economic performance. Populations in countries that share the same language or same culture demonstrate a higher propensity to move across borders. Furthermore, wars and other forms of political instability can cause forced migratory movements of asylum seekers and refugees which may evolve into temporary or permanent economic migrants.

The network effect, consisting of established social ties among the immigrants in a given country, can also contribute to easier integration, which fosters further migration movements (Bauer et al., 2000). The support of potential immigrants can takes various forms such as financing the journey, helping to find a job or appropriate accommodation, or providing information about education possibilities or access to social security. Therefore social networks may be an important element in lowering the costs of migration by providing beneficial network externalities (Epstein and Gang, 2004). Alternatively, immigrant clustering may be due to 'herd behaviour', where the migrants follow the crowd instead of rationalising their migration decisions according to the possible positive externalities. In addition, evidence suggests that the network effect plays a more important role in the case of low skilled workers rather than among high skilled workers (Jennissen, 2002).

Recently, immigration policy has become an important factor that shapes the intensity and characteristics of international migrations. Migration movements were initially relatively restrained after the oil-shocks in the 1970's which caused increased fears of recession, typically manifested in lower wages or higher unemployment for domestic workers (Zimmermann, 1995). Currently, immigration policies in countries of destination consist of various forms of restrictions that potential migrants face when applying to migrate, such as quotas that directly restrain the number of immigrants. Selective immigration policies were first introduced in Australia and Canada in the 1980's and adopted by other OECD countries later following the dissolution of socialism and influx of asylum seekers and refugees (Docquier and Rapoport, 2004). Therefore, due to these policies only a fraction of the population which intend to migrate will actually be able to move, implying a need for distinction between migratory pressures and *ex post* migration (Hatton and Williamson, 2003).

The determinants of illegal migration differ from those of legal migration. In addition to the income differential between the receiving and sending countries, the

severity of sanctions and probability of being detected are other important factors that influence the intensity of illegal movements (Entorf, 2000). Having in mind that the prevention of illegal migration is costly, in practice host countries face an optimal non-zero level of illegal migration, which is consistent with the most efficient allocation of scarce public resources.

The determinants of migration can be assessed both at the macro (aggregate) and micro level. At the aggregate level, the assessment of migratory pressures is typically based on the macroeconomic indicators of both the sending and receiving country (Fertig and Schmidt, 2000). A major weakness of this approach consists in the difficulty of distinguishing between labour and non-labour migrants which is important since whilst economic reasoning drives the migration decision of labour migrants, it is not always true for non-labour migrants. Thus an analysis of migration based on aggregate data will most probably mask the underlying motives for individual migration decision (Bauer and Zimmermann, 1999). At the micro level, the assessment of migratory pressures is frequently based on surveys that aim to reveal the socio-demographic structure of migrants and their reasons for migration (Kule et al., 1999). Survey-based analyses of emigrations allow an assessment of the demographic characteristics of emigrants, but they neglect the role of macroeconomic indicators in both the country of origin and destination.

6.2.3 Consequences of emigration

Taking into account the nature of international migratory movements, they have significant consequences for the socio-economic development of both the source and destination countries. However, theoretical analysis and empirical evidence on the impact of the migratory movements often give contradictory results. The main reason for such diverse views is the aggregate treatment of migration. In order to isolate the specific impact of migration, it is usually necessary to treat separately migrations of workers with different skill levels and durations of migrations. In this book we do not consider the implications of migration upon destination countries since we aim to assess the role of emigration as a labour market adjustment mechanism in labour exporting countries.

The two most frequently cited effects of emigration on the source country, are the release of labour market pressure and improvement in financial flows via

remittances (McCormick and Wahba, 2000). According to the first mechanism, emigration from less developed countries should lower the unemployment rate by reducing the labour supply (Drinkwater et al., 2003). However, if emigration mostly occurs among workers with a specific profile and there is low substitution between workers in different labour market segments, then the expected beneficial effect via diminishing unemployment will only be in this particular segment, with unemployment in other labour market segments remaining largely unchanged. More detailed analysis of the impact of remittances as a peculiar by-product of emigration and their likely labour market implications will be provided in section 6.2.4.

The emigration of highly educated workers, also known as the 'brain drain' exerts specific impact on the economic development of the source country. This phenomenon is defined as an international transfer of resources in the form of human capital from developing to developed countries (Beine et al., 2003). In the case of permanent emigration, the 'brain drain' represents an irreplaceable loss of human capital, but in the case of temporary emigration, the 'brain drain' could be viewed as beneficial for both destination and source countries. For instance, possible ways in which high-skilled emigration can positively influence the economy of the sending countries are remittances and technology transfers on their return (Docquier and Rapoport, 2004). Additionally, a higher rate of emigration among highly educated workers contributes to an increased domestic demand for education, which subsequently increases the human capital formation and development potential of the source countries but at a cost of higher budgetary spending in the case of subsidised education (Lundborg and Echea, 2002; Beine et al., 2003). As a consequence, some economists argue that there exists an optimal migration rate at which the positive effect of the 'brain drain' prevails over its negative effect on the economic development of sending country (Docquier and Rapoport, 2004). In order to attain the optimal migration rate of highly skilled workers various policy measures can be applied. Often, these policy measures are classified as 'six R's': return of migrants to their source country, restriction of international mobility, recruitment of international migrants, reparation for loss of human capital, resourcing expatriates and retention through educational sector policies or through economic development (Lowell, 2002).

6.2.4 The impact of remittances

In the previous section we have argued that one possible beneficial effect of emigration is exerted via remittances defined as financial flows arising from the cross-border movement of workers (Kapur, 2003). In this sense, we can differentiate between remittances *stricto sensu* as interpersonal transfers between emigrants and their relatives in the home country on the one hand, and repatriated savings upon return, on the other (Rapoport and Docquier, 2005). An evident limitation related to the analysis of the remittances is measurement inconsistency due to the difficulty in identifying and recording the informal channels through which transfers might reach the home country (Kapur, 2003; Rapoport and Docquier, 2005; Schrooten, 2005; EBRD, 2006). Although emigration and remittances are interrelated, they are determined by different factors. The economic theory that covers this issue provides different views about the microeconomic motivations to remit, as well as the possible macroeconomic consequences of the remittances.

At the micro-level a number of competing theories have been used to explain the factors that motivate emigrants to remit (Rapoport and Docquier, 2005). According to the altruistic explanation, the emigrants remit because they share a joint utility function with their relatives in the home country, which to some extent can explain the countercyclical variations of remittances (Chami et al., 2003; Ruggiero, 2005). Apart from being explained by pure altruism, a number of various other motives can be assumed. If remittances arise due to a need to 'buy' various types of services such as taking care of the migrant's assets or relatives, its motives are labelled under the term 'exchange of services' (Rapoport and Docquier, 2005). In the cases where remittances are a cause rather than consequence of migration, they are driven by strategic motives. In a similar vein, investment motives explain remittances as repayment of 'loans' for investment in education and/or migration. When remittances are driven by investment motives they are expected to be sensitive to interest rate differentials, political risk and uncertainty and therefore would tend to be procyclical (Ruggiero, 2005; Giuliano and Ruiz-Arranz, 2006). In rural areas, remittances are often used as a source of insurance against high income volatility. Finally, remittances can be viewed as investment in inheritance on the side of the migrant and at the same time as an enforcement device to secure remittances on the side of the family (Rapoport and Docquier, 2005). Nevertheless, in practice we often

find situations where different emigrants are induced by different motives to remit, as well as situation where different motives coexist within the same person.

According to the above-cited list of motives, we expect that various groups of workers with different socio-demographic characteristics will demonstrate different tendencies to remit. Having in mind the increased importance of high-skilled emigration, it is interesting to investigate any link between the amount of remittances and the level of 'brain drain'. Hence, we would like to know whether high-skilled workers are more prone to remit than low-skilled workers in order to disentangle the dilemma about the economic consequences of an increased 'brain drain' (section 6.2.3). According to the conventional wisdom, high-skilled workers earn more and therefore can remit more. However, some recent empirical finding reveal that 'brain drain' is associated with a lower rather than a larger flow of remittances (Faini, 2006). This is explained by skilled migrants being more likely to come from wealthy families and they are keener to bring their closest relatives to the host country.

At the macro-level, we can generally distinguish between two opposing effects of remittances on domestic labour market performance, with some authors differentiating between 'productive' and 'unproductive' use of remittances (Drinkwater et al., 2003). According to the negative view on remittances, they are mostly used for consumption purposes thus exerting a negative income effect on labour market participation of the remaining family members in the destination country. Therefore, remittances exert an upward shift on the reservation wage, which may discourage labour supply or diminish the search effort among the remitters' relatives in the home country. In this context, some authors claim that there exists a moral hazard problem, which might be part of a mechanism responsible for a negative relationship between remittances and economic growth (Chami et al., 2003). Furthermore, if mostly spent on goods and services, remittances may cause inflation, which can lead to excessive wage claims or appreciation of the domestic currency.[32] However, even in the cases where remittances are mainly spent on consumption they may still exert positive effects on the home economy by increasing aggregate demand. In the spirit of Keynesian approach the short-run impact of remittances on the sending economy would depend on the value of multiplier (Rapoport and Docquier, 2005).

[32] This phenomenon is also known as 'Dutch disease'.

Alternatively, remittances can be used for investment purposes in order to overcome credit constraints faced by the firms in the home country. In this case, we expect remittances to play a positive role in the economic development of the sending country and a better performance of the domestic labour market viewed in terms of reduced unemployment. Although the empirical evidence suggests that in reality only a small portion of remittances are directly invested, they can still be channelled into productive use by the banking system (Drinkwater et al., 2003). With this in mind, remittances can promote growth even in the less financially developed countries by providing alternative way to finance investment *i.e.* by becoming a substitute for the inefficient or non-existent credit markets (Giuliano and Ruiz-Arranz, 2006). However, this positive impact of remittances on growth can be expected only in countries where governments implement economic policies that support a sound investment environment (Catrinescu et al., 2006). The evidence on the role that remittances play in transition countries will be analysed in the next section.

6.3 Emigration from transition countries

Emigration from ex-socialist countries during the pre-transitional period was generally not recognised formally, and was ignored as a form of labour market adjustment mechanism. Apart from clandestine emigration, other forms of official emigration were forbidden by the socialist regimes (OECD, 2001). With respect to this, former Yugoslavia was an exception, because some forms of temporary emigration officially existed during the period of socialism. The formal aspects of emigration regarding the rights and obligations of emigrants were covered by a number of legal acts. A typical example was the bilateral recruitment agreement for 'guest workers' with Germany in 1968, according to which workers possessing required qualifications were migrating for a short period under the so-called rotation principle (Janeska, 2001).[33]

[33] The rotation principle required guest workers after one or two year period to return home in order to make room for other guest workers and prevent their permanent settlement.

6.3.1 Characteristics of emigration from transition countries

Following the large adverse economic shock, the role of internal migration as an equalizing mechanism in facilitating regional adjustment in transition countries has attracted significant attention (Fidrmuc, 2002; Bornhorst and Commander, 2006). Despite the large regional differences in level of wages and unemployment, internal migration has not been found to be an effective tool in facilitating the regional adjustment. According to these findings, labour in transition countries is relatively geographically immobile, which led to the prediction of modest potential westward migrations after the EU enlargement.

Regarding the advanced transition countries, there exists an abundant literature that covers the effects of EU enlargement on the labour markets of both current EU members as destination countries and new members from Central and Eastern Europe as countries of origin. As a consequence of both income differentials and differences in employment opportunities, one would predict large inflow of migrants from CEECs and Baltics into the current EU members. However, despite fears in some Member States, a mass westward migration after EU enlargement has not been experienced. Most analysts estimated between 2 and 4 percent of the population of new EU member states would emigrate after the accession if given the right to unregulated entry (Bauer and Zimmermann, 1999; Boeri and Brucker, 2001; Alvarez-Plata et al., 2003). Accordingly, increased westwards movements were expected to cause a slight decline in unemployment rates in accession countries, accompanied by unemployment increases in the original EU members (Fertig, 2003). After the 2004 EU enlargement, the actual westward emigration from EU-8 has been rather limited. Having in mind that the EU-8 remains one of the strongest performing regions with GDP growth in 2005 reaching 5.6 percent, we can argue that the economic motivation for further mass westwards movements from this region remain weaker than initially thought (EBRD, 2006). Despite the large real wage differentials between new and old EU members that create a significant ‘push’ factor, the annual flows from EU-8 during the period 2003-2005 represented less than 1 percent of the working age population aged 15 to 64 in all Member States, with the exception of Austria and Ireland (European Commission, 2006). Moreover, according to this source ‘workers’ mobility from the EU-8 to the old Member States has had a positive

effect on their economies by relieving labour market shortages and skill bottlenecks' (p.218).

The figures of immigrants originating from transition countries in selected OECD countries are presented in Table 6.1.

Table 6.1 Top five nationalities of immigrants from transition countries in selected OECD countries in 1999 (thousands)

Austria		Germany		Italy	
Serbia and Montenegro	77.1	Serbia and Montenegro	737.2	Albania	115.8
Bosnia-Herzegovina	34.2	Poland	291.7	Serbia and Mont.	54.7
Croatia	23.2	Croatia	214.0	Romania	51.6
Macedonia	4.0	Bosnia-Herzegovina	167.7	Poland	27.7
		Russia	98.4	Macedonia	18.6
% of total foreigners	57.9	% of total foreigners	20.5	% of total foreigners	21.4
Netherlands		Sweden		Switzerland	
Serbia and Montenegro	7.2	Bosnia-Herzegovina	34.2	Serbia and Mont.	193.7
Bosnia-Herzegovina	6.1	Serbia and Montenegro	22.7	Macedonia	54.0
Poland	5.6	Poland	16.3	Croatia	43.8
Russia	3.3	Croatia	7.2	Bosnia-Herzegovina	42.7
Croatia	1.6	Russia	5.1	Russia	5.4
% of total foreigners	3.7	% of total foreigners	17.5	% of total foreigners	24.8
Australia		Canada (1996)		United States (1990)	
Former Yugoslavia	208.4	Poland	193.4	Former USSR	389.9
Poland	69.5	Former Yugoslavia	122.0	Poland	388.3
Former USSR	55.2	Former USSR	108.4	Former Yugoslavia	141.5
Hungary	26.6	Hungary	54.2	Hungary	110.3
		Former CSFR	41.2	Romania	91.1
% of total foreigners	8.0	% of total foreigners	10.4	% of total foreigners	5.7

Source: SOPEMI 'Trends in International Migration', Annual Report 2001

From Table 6.1, we notice that the most popular destination for emigrants from transition countries are neighbouring west European countries such as Austria, Germany, Italy and Switzerland where they represent a significant part of the total number of foreigners. It has been estimated that around 70 percent of the immigrants in EU-15 originating from CEECs-10[34] reside in Germany and Austria, *i.e.* neighbouring countries, which have long borders with CEECs-10 (Alvarez-Plata et al., 2003). The proximity of these countries has been considered as an important 'pull' factor for strong migratory movements from CEECs. At the same time we can observe a large proportion of immigrants coming from the former Yugoslavia countries attributed to the already established social networks and traditions of migration but also as consequence of the number of civil wars in the Balkan region (IOM, 1998).

[34] CEECs-10 consist of the EU-8, Bulgaria and Romania.

According to a large survey carried out in 11 transition countries in 1998, we can distinguish among various types of migration potentials (IOM, 1999). First, there is potential for permanent emigration, which is primarily oriented toward the 'New World' (USA, Canada, and Australia). In this context, the 'push' factors are the most important in generating migration flows, whereas the choice of the country is mainly determined by the 'pull' factors particularly the established social networks among certain social groups (IOM, 2003b). The intensity of emigration toward the 'New World' has been highly influenced by their established immigration policies already discussed in section 6.2.2.

Second, there is potential for long-term temporary emigration, which is a characteristic of the less developed transition countries such as CIS countries and SEECs. Some of these, including Kazakhstan, Albania, Georgia and Armenia represent prominent labour exporting countries, which due to emigration experienced a rapid and significant fall in their populations. The estimated emigration from the above countries during the period 1995-2000 accounted for 8.8, 8.6, 7.4 and 7.2 percent of their total populations respectively (World Bank, 2005b). The main determinants of emigration from these countries were their relatively high level of unemployment and low standard of living (IOM, 2003a). The analysis of migrants' profile shows that male, young and more educated workers experience the highest propensity to emigrate. At the same time these workers are characterised by the highest propensity to remit (Papapanagos and Sanfey, 1998).

Third, there is potential for short-term temporary emigration, a characteristic of the more advanced transition countries. Some of these countries such as the Czech Republic, Slovenia and Hungary during the mature phase of transition 1995-2000 experienced even positive net-migration flows (World Bank, 2005b). The empirical findings show that in advanced transition countries such as Hungary, social networks play important role in decision-making regarding the choice of location of migration (Epstein and Gang, 2004). Short-term migration from CEECs to Western Europe has been estimated to have positive effects on development prospects in this region due either to greater diffusion of gained knowledge upon return or utilisation of repatriated savings for establishing new businesses (Leon-Ledesma and Piracha, 2001).

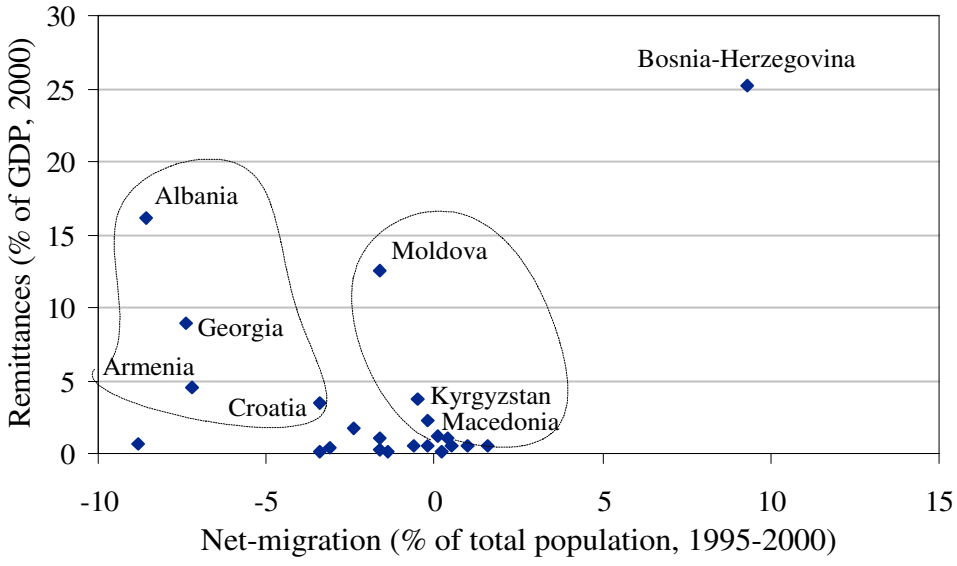
In sum, the impact of emigration upon the economic development in transition countries is ambivalent, having both positive and negative consequences (IOM,

2003a). Short-term emigration has been identified as generally having a positive impact on development mainly via the increased skills of emigrants acquired abroad and remittances as an important determinant of the business establishment and expansion. In contrast, long-term emigration has generally been considered as very costly for the sending country (Kule et al., 1999). These findings have valuable implications for policy-makers with respect to targeting the integration of returning highly qualified emigrants as well as preventing long-term emigration among low-skilled workers (IOM, 2003b).

6.3.2 The role of remittances in transition countries

As mentioned in the previous section, alongside increased emigration some transition countries have also experienced significant financial transfers from their citizens living abroad. We would expect that remittances represent a particularly important source of finance in poorer transition countries such as SEECs and CIS helping *inter alia* the development of small and medium-sized enterprises (EBRD, 2006). The relationship between emigration from transition countries and the amount of remittances is depicted in Figure 6.1. We locate the transition countries in two-dimensional space where on the horizontal axis is presented net-migration between 1995 and 2000 as a percent of total population, while on the vertical axis are presented remittances as a share of GDP in 2000.

Figure 6.1 Relationship between remittances and emigration in transition countries



Source: World Development Indicators, 2005

At first sight, from Figure 6.1 we do not observe any discernable pattern in the relationship between net-migration and remittances. In some countries such as Albania, Georgia, Armenia and Croatia high emigration is associated with high relative shares of remittances. In contrast, Moldova and to lesser extent Kyrgyzstan and Macedonia are examples of countries where remittances are still high but not accompanied by significant new emigration movements. Consequently, we argue that in this group of countries the stocks of previous emigrants plays a more important role in generating remittances. In addition, it appears that Bosnia-Herzegovina is an exception, since the large amount of remittances is associated with high positive net-migration. This is due to the increased number of returning asylum seekers after the war. According to Schrooten (2005), the high relative importance of remittances compared to other sources of finance is due to two reasons. First, in most of the less developed transition countries the amounts of remittances are several times higher than FDI or official financial aid and second, an advantage of remittances comes from their lower volatility compared to the alternative forms of private transfers such as FDI or exports.

Today, there exist a number of studies of the determinants and effects of remittances in transition countries. Despite the general academic debate about the impact of remittances on the economic development of sending countries, the empirical evidence from transition countries is rather optimistic. According to Leon-Ledesma and Piracha (2001) the short-term migration primarily observed in CEECs and Baltics may have a positive effect, since part of remittances are used to establish businesses upon return, whereas the unemployed who migrate could positively affect the average product in home country. Furthermore, they find that the positive impact of remittances on investment is higher than that exerted on consumption, which is opposed to the previous work on the impact of remittances in the traditional emigration countries. Another study based on dynamic panel data has revealed that remittances in transition countries are driven by factors which are not favourable for the sending economies and operate as a substitute for the domestic banking sector (Schrooten, 2005). However, the empirical evidence from less-developed transition countries such as Albania and Moldova shows that remittances are primarily used as effective social assistance and safety net, which alleviate the high level of poverty (Uruci and Gedeshi, 2003; Ruggiero, 2005). Finally, the results from a survey carried out by EBRD (2006) shows an increase in the role that remittances play in small

enterprise development. According to this study, enterprises in transition countries with access to remittances typically financed 40 percent of their start-up costs from this source. In addition, remittances also help businesses to access other sources of finance such as bank loans.

6.4 Emigration from Macedonia

Since Macedonia was a part of former Yugoslavia, the phenomenon of emigration was present before transition to market economy. The intensity and characteristics of the emigration from Macedonia has varied throughout history according to the socio-economic development of the country and changes in immigration policies in the traditional destination countries. Following the large initial shock at the beginning of transition, one can expect that emigration pressures have continued to exist after the adoption of market economy. However, the size and composition of Macedonian *ex post* emigration has been also to some extent shaped by the above-mentioned immigration policies. In the remainder of this section we consider the main characteristics of emigration from Macedonia followed by an analysis of its determinants and the role of remittances.

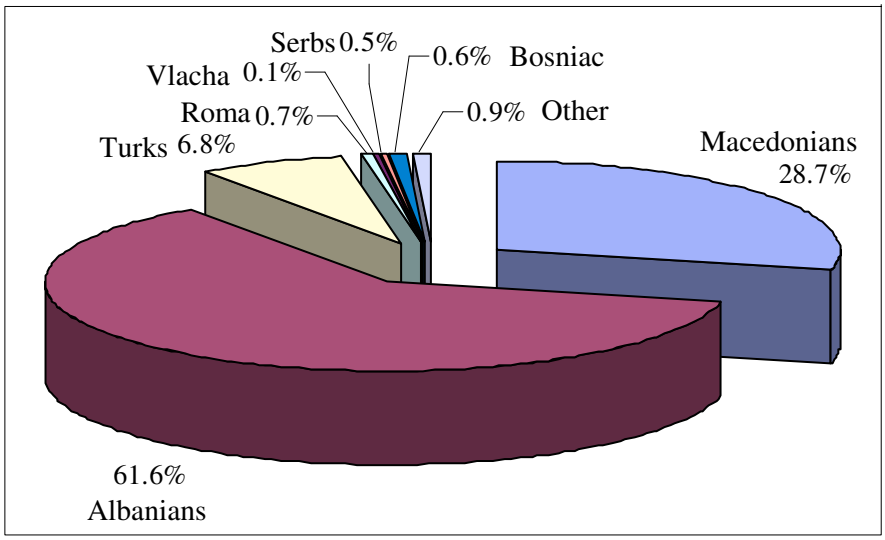
6.4.1 Characteristics of Macedonian emigration

In order to assess the characteristics and recent trends in Macedonian emigration we use results from the last two censuses of population carried out in 1994 and 2002. The estimated stock of emigration from Macedonia in 1994 was 173,610 whereas the number of short-term emigrants *i.e.* those who emigrated for a period of less then one year was 16,102, the latter representing 0.83 percent of total Macedonian population at that time. With respect to the coverage, the methodological approach in 2002 census differs from the previous censuses, since it considers only short-term emigration. Regardless these methodological differences, in 2002 we observe a slight increase in the number of short-term emigrants. The respective figure reached 21,412, representing roughly one percent of total Macedonian population. By accounting for the inflow of workers either as returned emigration or immigration of foreign workers, the net change would be lower. Hence, the net-migration between 1995 and 2000 demonstrates only a modest net outflow which accounts for just 0.2 percent of total Macedonian population (World Bank, 2005b).

Regarding the structure of Macedonian emigration, we can discern several characteristics. First, taking into account the stock of emigrants by countries of destination according to the results from the previous censuses, it is noticeable that Macedonian emigrants have traditional destinations (Janeska, 2001). For instance, about one third of the emigrants temporarily or permanently immigrated to Australia, another third to Germany and Switzerland, while the rest reside in other OECD countries. The structure of Macedonian emigration by main destination countries and duration of emigration is presented in Appendix 6.1.

Second, the structure of Macedonian emigration with respect to the ethnic affiliation does not correspond to the structure of total population. The Macedonian short-term emigration according to the ethnic affiliation is graphically illustrated in Figure 6.2, whereas detailed distribution of emigrants by countries of destination is presented in Appendix 6.2.

Figure 6.2 Macedonian short-term emigration according to the ethnic affiliation



Source: Census of Population, Households and Dwellings in the Republic of Macedonia, 2002, Book IV

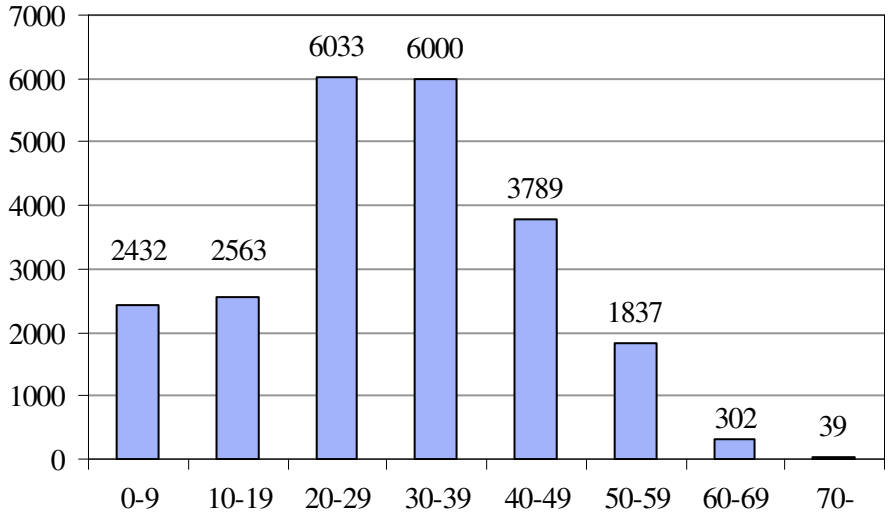
According to Figure 6.2, 61.6 percent of the emigrants have an Albanian ethnic background, 28.7 percent have Macedonian ethnic background, 6.8 percent originate form Turkish ethnicity, whereas the rest of 2.8 percent is represented by other ethnic minorities. Having in mind that population with Albanian ethnic background represents only about 25 percent of total Macedonian population, it is obvious that this segment is characterised by highest propensity to emigrate. The

relatively high emigration among Macedonians with Albanian ethnic background can be attributed either to existing traditional emigration or possibly discrimination and lower level of loyalty to Macedonian state.

Third, considering the gender of emigrants, about 71.5 percent are males. The observed gender difference in the composition of Macedonian emigration is consistent with findings from other transition countries, where males have a higher probability of emigration than females (Papapanagos and Sanfey, 1998; Uruci and Gedeshi, 2003; Ruggiero, 2005).

Fourth, the composition of Macedonian short-term emigration by age groups presented in Figure 6.3 shows that most of the emigrants are concentrated in the range from 20 to 39. This finding is in line with the assumption of human capital theory according to which young and prime age workers are particularly prone to 'invest' in their human capital by taking emigration decision.

Figure 6.3 Structure of Macedonian short-term emigration by age groups



Source: Census of Population, Households and Dwellings in the Republic of Macedonia, 2002, Book IV

In sum, the characteristics of Macedonian short-term emigration resemble those observed in other transition countries as demonstrated in section 6.3.1. Despite the depressed state of the Macedonian labour market accompanied by increased poverty and inequality as potential 'push' economic factors, the intensity of short-term emigration over the last decade has not substantially increased. We can partly attribute this pattern to the restrictive immigration policies in the labour importing countries which are traditional destinations of emigration from Macedonia. We next

pursue a more detailed analysis of the factors considered as possible determinants of Macedonian emigration.

6.4.2 Determinants of Macedonian emigration

In this section we model the size of Macedonian short-term emigration by using multiple linear regression to estimate the impact of the different factors theoretically elaborated in section 6.2.2. Due to the inability to access individual data, the analysis has to be based on aggregate data taken from the census of population in 2002. Assuming that Macedonia is potential labour exporting country we chose as response variable the gross emigration flow *i.e.* the number of emigrated persons by destination country. Among the possible explanatory variables in the model we consider the stock of emigrants in destination country, Gross National Income (GNI) per capita in destination country, unemployment rate in destination country and distance between Macedonia and country of destination taken as distance between their capitals. Therefore, our model as specified in (6.1) represents a sort of 'gravity model' used to explain the potential determinants of emigration flows.

$$EF_i = \beta_0 + \beta_1 Stock_i + \beta_2 GNI_i + \beta_3 U_i + \beta_4 Distance_i + v_i \qquad \ldots (6.1)$$

where symbols stand for the following variables:

EF – No. of emigrated persons from Macedonia in 2002 (emigration flow)

Stock – Estimated stock of emigrants from Macedonia

GNI – Gross National Income (GNI) per capita in destination country

U – Unemployment rate in destination country

Distance – Distance between Macedonia and country of destination

The rationale for choosing the above-specified model lies in the need to test the validity of the theoretical relationships commonly used to explain the intensity of migration flows. Moreover, this specification is consistent with the empirical literature attempting to explain the determinants of migration movements (Alvarez-Plata et al., 2003; Hatton and Williamson, 2003; Jennissen, 2003). In a majority of estimated migration models the explanatory variables include the income and

employment differences between sending and receiving countries, demographic structure and, other specific variables such as geographical and language proximity.[35]

According to our previous theoretical elaboration, we expect that the stock of emigrants in a destination country has a positive impact on the emigration flows, since it can be taken as a proxy for the already established social networks. The level of GNI per capita in destination country *a priori* is also positively related to the intensity of emigration because it represents the intensity of the 'welfare magnet' effect. The level of per capita GNI in this case can also be considered as a proxy for the level of real wages. Since, we analyse emigration only from Macedonia, we operate with the original values of GNI instead of taking differences between the Macedonian GNI and respective values in destination countries.

In contrast, the two remaining variables *i.e.* the unemployment rate in receiving country and the distance between the country of origin and destination country are expected to have negative impact on emigration. The former of these variables represents the labour market tightness and according to Keynesian theory represents one of the main factors inducing migration movements. Similarly as in the case of GNI, we operate with unemployment rates in destination countries instead of differences between unemployment rates, since all observations are related to Macedonian emigration. The distance between Macedonia and destination country as an explanatory variable is a proxy for the direct costs that emigrants face when taking an emigration decision.

In our multiple regression model we operate with log-values of the variables in order to estimate the elasticity of emigration with respect to the explanatory variables. Since the data concern the *ex post* emigration, we assume a possible impact of the immigration policies in destination countries upon emigration outcomes. The summarised results of the multiple regression model are presented in Table 6.2, whereas the full print-out is given in Appendix 6.3.

[35] For example, Alvarez-Plata et al. (2003) propose the following migration function: $mst_{fht} = f(w_{ft}, w_{ht}, e_{ft}, e_{ht}, P_{ht}, Z_{fh})$, where mst_{fht} is the share of migrants from country h residing in country f in percent of the home population, w denotes wage, e is the employment rate, P_{ht} is population in the home country and, Z_{fh} denotes a vector of time-invariant variables which affect the migration between two countries such as geographical proximity and language.

Table 6.2 Summary results from the estimated multiple regression model (6.1) (dependent variable: Number of emigrated persons from Macedonia in 2002)

Variable	Value	Std. error	t-value	Pr (>| t |)
Intercept	2.0787	1.8048	1.1518	0.2702
Stock	0.3936	0.1146	3.4351	0.0044
GNI	0.5000	0.3645	1.3715	0.1934
U	-0.2169	0.7273	-0.2982	0.7703
Distance	-0.8645	0.2923	-2.9577	0.0111
Multiple R-Squared: 0.6413 F-statistic: 5.81 on 4 and 13 degrees of freedom, the p-value is 0.006593 Lagrange multiplier test of residual serial correlation: 1.3238 (0.250)* Ramsey's RESET test for the functional form: 8.7435 (0.003)* Jarque-Bera test for normality of residuals: 0.83787 (0.658)* Koenker-Bassett test for heteroscedasticity: 0.75322 (0.385)* **In the parentheses are given probabilities of obtaining the estimated statistics*				

Source: Author's calculations

The results from Table 6.2 show that the stock of emigrants in a destination country and the distance between countries are statistically significant variables at 5 percent confidence level. According to the model, an assumed 10 percent increase in the stock of emigrants in destination country will increase the emigration by about 3.9 percent. In addition, a 10 percent increase in the distance to destination country results in 8.6 percent lower emigration flow. The other two variables in the model, *i.e.* the level of GNI and the unemployment rate have the expected signs, but they are not statistically significant. The explanatory power of our model is reasonably high since the coefficient of determination shows that about 64 percent of the variation in the emigration flows is 'explained' by the combination of the independent variables. In addition, the diagnostic tests show that only functional form appears to be a substantial problem, which might be explained by the fact that not all included explanatory variables are statistically significant.

From the previous analysis we draw conclusion that neither neo-classical explanations based on the differences in incomes nor the Keynesian theoretical approach based on the differences in employment prospects have significant explanatory power in our aggregate model of Macedonian emigration. Apart from data limitations, these results can be partly explained by the introduction of restrictive immigration policies during the 90's in most of the countries considered as traditional destinations for Macedonian emigrants. On the contrary, the other determinants of migration such as network effects and proximity of destination country appear to be

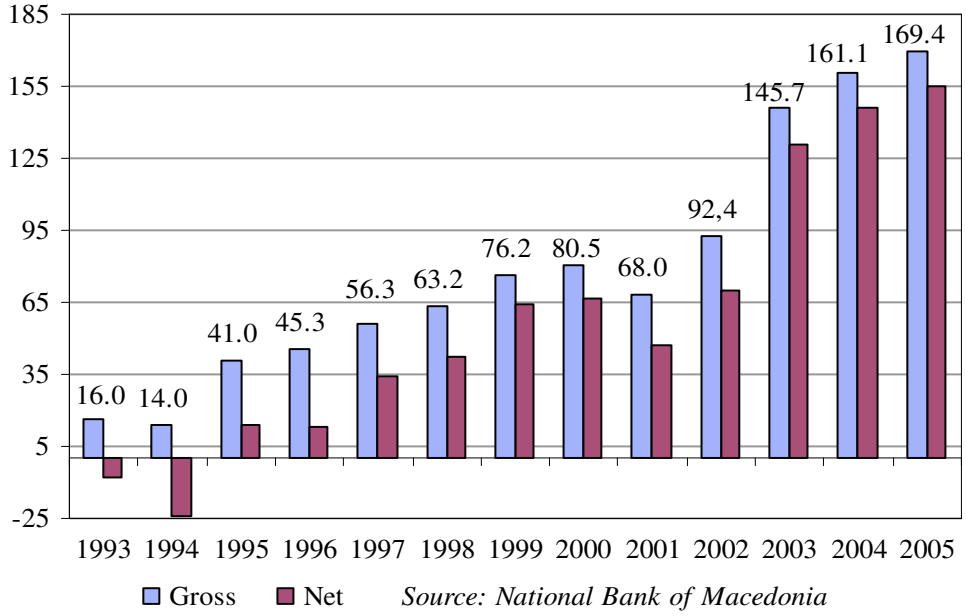
important determinants of the intensity of emigration from Macedonia. It is important to point out that this analysis cannot capture the determinants of illegal emigration since it is based on official data. These results are in line with the empirical evidence from the recent analysis of gross migration flows in 27 OECD countries (Pedersen et al., 2004). Empirical results suggest that there is no direct 'welfare magnet' effect explaining migration flows. In contrast, the network effect and 'distance', including the geographic distance and linguistic and cultural ties seem to be strong driving forces in the migration process.

The potential 'brain drain' from Macedonia has been investigated by Janeska (2003). According to the survey carried out among final-years students in several Faculties, there exists a high potential for intellectual emigration. About 85 percent of the interviewees have been thinking or planning to emigrate from Macedonia. The economic crisis in the country accompanied by political instability has been identified as the main reasons for such large potential emigration among the highly educated population. Since, most of the interviewees were intending to emigrate on a long-run basis, this high 'brain drain' potential in Macedonia is likely to have a negative impact on the future economic development of the country.

6.4.3 The role of remittances in Macedonia

According to our previous analysis of remittances in transition countries, Macedonia belongs to the middle range. The relative share of remittances in the official GDP in 2005 represented about 3 percent, which is close to the observed relative share in Croatia, but significantly below the shares in Bosnia-Herzegovina and Albania (World Bank, 2005b). Net remittances in Macedonia have varied over the period of transition, as shown in Figure 6.4. After the period 1993-1994, marked with outward financial flows, remittances since 1995 have remained positive. The growth during the period 1995-2000 was reversed in 2001 probably due to the political instability and mild recession experienced at that time. Since 2002 remittances have shown a sharp growth that has continued up to the present. Therefore, the variations of remittances in Macedonia and the generally observed macroeconomic variations already examined in Chapter 1 go hand in hand, both significantly influenced by the political ambience in the region.

Figure 6.4 Remittances in Macedonia (million US dollars)



Regarding the final utilisation of remittances in Macedonia we identify a gap in the literature primarily due to the scarcity of accurate data. However, according to Xhaferi (2004), Macedonian emigrants have a relatively high propensity to remit, but a large portion of these remittances are used for consumption purposes whereas, little is used for establishment of new businesses which may indicate their countercyclical characteristics. Therefore, there is a room for designing policy measures to induce a more productive use of remittances and encourage the transfer of acquired entrepreneurial and managerial knowledge.

6.5 Conclusion

Emigration from transition countries has been considered as a potentially important labour market adjustment mechanism to adverse economic shocks. As a result of the transitional recession, a considerable number of the labour force in transition countries were expected to migrate toward developed western countries. In our analysis we found that potential emigration from transition countries is closely related to their general labour market performance. In this context, a number of advanced CEECs and Baltics have experienced lower migration pressures with an emphasis on short-term emigration, whereas the less-developed SEECs and CIS countries have faced much intense migration pressures, mostly long-term emigration. According to our analysis the main economic 'push' factors that initiate emigration

from less-developed transition countries are the high rates of domestic unemployment and the relatively low living standards.

The consequences of emigration in transition countries are ambiguous, since the positive effects from remittances and increased level of skills are mixed with the negative effects from the loss of human capital in the domestic economy. The amounts of remittances in many less-developed transition countries have been estimated to be large, and therefore potentially significant for their economic development. However, according to the empirical evidence, the impact of remittances on the home economies is not clear-cut. While in most of advanced transition countries remittances are transferred through bank channels and invested in new businesses, in the less-developed transition countries they are mostly used as a safety net, thus predominantly playing the role of a tool for poverty alleviation.

The phenomenon of emigration has existed for a long period of time in Macedonia, having been already present as a form of labour market adjustment in former Yugoslavia. The persistent high joblessness in Macedonia accompanied by low relative earnings implies the presence of high emigration pressure. According to data from the last census carried out in 2002 we identify that ethnic Albanians, males, young and prime age worker are the Macedonian groups most inclined towards emigration. However, we do not find that this high emigration potential has been translated into a large outward movement of population, which can be ascribed to the restrictive immigration policies of the traditional destination countries.

Among the factors that influence the destination of Macedonian emigration, we identified the stock of emigrants in the destination country, taken as a proxy of established social networks as an important positive factor. In contrast, we found that distance to destination country, taken as a proxy of the direct cost of emigration has a significant negative impact on emigration. The potential 'brain drain' from Macedonia is estimated to be at a relatively high level, possibly having negative implications for its future socio-economic development. Despite the generally observed modest emigration flows, the level of remittances in Macedonia is high relative to short-term emigration, indicating that a large fraction of remittances originates from the stock of long-term emigrants. In addition, there is no strong evidence that remittances in Macedonia manifest procyclical behaviour thus, pointing out the need for creating policy measures that foster their usage for investment purposes.

CHAPTER 7

A MODEL OF THE SUSTAINABLE RATE(S) OF UNEMPLOYMENT IN MACEDONIA

7.1 Introduction

In the previous analysis we have critically examined the main features of the labour markets in transition countries, with a particular accent on the SEECs. It has been stressed that the initial transitional shock had tremendous consequences for the labour markets manifested, in particular, through high and persistent unemployment rates. Moreover, these labour markets have been characterised by strong segmentation meaning that certain groups of workers are particularly marginalised and facing poor employment prospects (Chapter 1, section 1.4.3). According to the analysis in Chapter 3, labour market flows reflect a stagnant unemployment pool and the low probability of exiting unemployment to employment, reflecting the depressed characteristics of the SEECs labour markets.

Despite the traditional forms of adjustment to contractionary shocks through reduction of employment and wages, high unemployment rates continued to persist a

long time after the start of transition inducing additional labour market adjustment mechanisms. In our previous analyses we demonstrated that increased unemployment is coupled with rising non-participation, flourishing employment in the informal sector and increased emigration which partly absorbed the unemployed population. The labour market segment comprising 'discouraged workers' who experience long-term unemployment has been particularly susceptible toward exiting the labour market or seeking alternative forms of employment. These labour market adjustment mechanisms have emerged partly as a result of the inability of the governments in transition countries to undertake radical and effective measures to assist transformation from a centrally planned to a market economy *i.e.* to provide a climate for rapid job creation in the formal part of the private sector. Moreover, they can be viewed as stabilisers that have alleviated the problem of mass unemployment as well as its enormous social, economic and political consequences. In SEECs the identified overlaps between these labour market adjustment mechanisms and unemployment status led to a persistent unfavourable situation, often described as a 'high-unemployment trap' (Burda, 1993) or 'bad' equilibrium (Johnson et al., 1997; Roland, 2000).

Nowadays, governments in SEECs face a challenging task to cope with the problems of increased unemployment and declining labour force participation as well as their associated impact upon public finances. In order to cushion the social consequences engendered from high and sustained unemployment, governments in transition countries have at their disposition various sets of policy instruments. In this context, in our analysis we will focus on the design of passive labour market policies, which *inter alia* play a role as an automatic stabiliser in the economy (Mickiewicz and Bell, 2000). As presented in Chapter 1, most of the transition countries after facing increased budgetary burden have tried to cure the problem of unemployment by reducing the generosity of unemployment benefits[36] in order to strengthen the incentives among unemployed to look for jobs. However, these measures were not accompanied by sufficient job creation in the formal sector and therefore did not produce the expected results (Boeri, 2000). In addition, as alternative policies, governments may modify social transfers intending to target the inactive population and increasing the level of monitoring of employment in the informal sector.

[36] This reduction included both lower replacement rates and shorter duration.

After having analysed the general characteristics of the labour markets in transition countries and particularly those of the SEECs, in this chapter attention will be paid to the formal development of a model of the sustainable rate of unemployment. The model will deal with the mature phase of transition in less developed transition countries, characterised by a slower speed of transition and depressed labour markets. For this purpose we will use the key findings from our assessment of labour market functioning during transition with an emphasis on the role of labour market adjustment mechanisms and relevant labour market policy instruments.

Most of the formal models that so far have been developed in order to describe the labour markets behaviour during transition are based upon the optimal speed of transition literature (Chapter 2, section 2.3). These models are instructive for the first phase of transition where the transfers of labour predominantly occurred between declining state and rising private sector. As already stressed in Chapter 2, some of these models do not treat at all the role of the alternative labour market adjustment mechanisms (Aghion and Blanchard 1994; Blanchard, 1997; Garibaldi and Brixiova, 1998; Tichit, 2006), whereas others pay partial attention to only some of these mechanisms. For instance, the role of the informal employment is treated in Johnson et al. (1997), Bouev (2001) and Bouev (2004), emigration is considered in Papapanagos and Sanfey (2003), while non-participation is included in Boeri (2000) and Bruno (2005).

Thus, the aim of the model is to fill the gap in the literature by jointly assessing the role of passive labour market policies and the impact of labour market adjustment mechanisms on labour market outcomes. In addition, dynamic analysis will be used for exploring the possible development scenarios with the purpose of designing an optimal policy regime. In what follows in this chapter, we will first develop the model of sustainable rate of unemployment by integrating the established relationships between labour market variables; second, we calibrate the model by using the results obtained in the previous chapters in order to match the case of Macedonia; and third we estimate the extent to which alternative adjustment mechanisms have influenced the sustainable unemployment rate as well as assessing the effects of various policy regimes upon labour market outcomes by using the instruments of passive labour market policies. Alongside the above-stated aims, we

will also consider the possibilities of multiple equilibria outcomes and examine the preconditions which lead to a given labour market equilibrium.

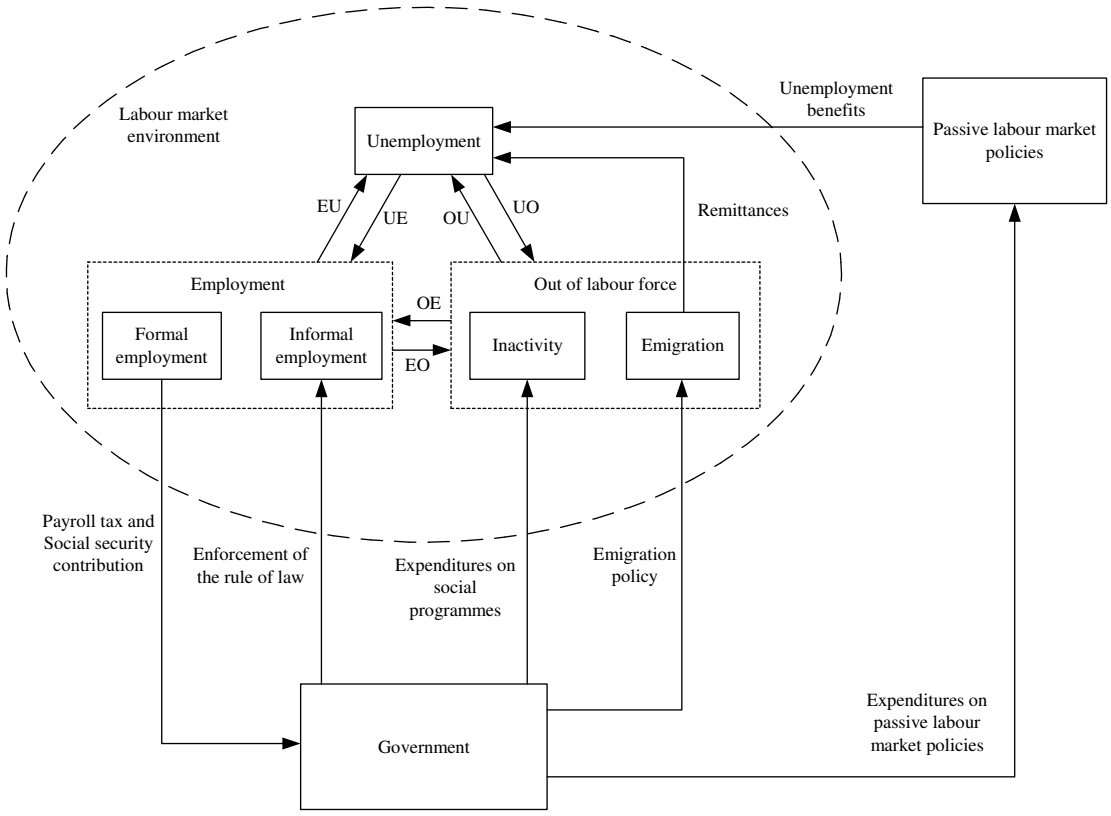
7.2 Building blocks

The model of sustainable rate of unemployment developed below is conceived as a structural model that brings together the main identified characteristics of the labour markets in SEECs. Following the principle of parsimony, the model will deal with the domestic labour market where one worker may be assigned to one of three possible labour market states: employment, unemployment or inactivity. As elaborated in Chapter 4, a key feature of the labour markets of South-East European region is their duality in terms of existence of two different sectors: formal and informal. The workers in the formal sector enjoy greater job security and paid health, social and pension contributions, whereas the informal sector is considered as a precarious sector comprising jobs with a lower level of productivity, lower job security and few non-wage benefits. This model will try to capture the differences in employment prospects in these two sectors, as well as policy responses that influence the allocation of labour between them. The informal employment in our model is a possible alternative for those workers who cannot find employment in the formal sector, which implies a certain level of occupational mobility.

Another alternative for the unemployed is to drop out of the labour force, which means ceasing to search for a job and take early retirement or exist on various types of benefits such as disability pensions, social assistance or just participate in household production and leisure. As demonstrated in Chapter 5, these forms of labour market adjustment may directly reduce the unemployment, though usually imposing a budgetary burden. Finally, a third alternative to the unemployment is emigration, associated with an act of exiting the domestic labour market. However, as we have identified in Chapter 6, the recent slowdown in emigration flows due to the strengthened institutional barriers suggests its current minor relevance relative to the other labour market adjustment mechanisms. Therefore, with the purpose of keeping a manageable degree of complexity, emigration is not considered in the initial development of the model but treated as one of the possibilities for its further extensions. The conceptual framework for building the model of sustainable rate of

unemployment that accounts for the aforementioned features is illustrated in Figure 7.1.

Figure 7.1 Conceptual framework for building the model of sustainable rate of unemployment



The dashed ellipse in Figure 7.1 encompasses the labour market environment consisting of the stocks of workers in each of the three basic labour market states: employment, unemployment and out-of-labour force as well as the flows of workers between them. Furthermore, within the status of employment we can distinguish between formal and informal employment, whereas in the out-of-labour force category inactivity and emigration can be separately considered. Despite the possibility of distinguishing various sub-groups of the unemployed according to the level of attachment to the labour force, this group of workers will be regarded as a homogenous group (Jones and Riddell, 1998; Brown et al., 2006). In this context, it is important to notice that we assign a worker only to one category, without considering the possibility of overlaps between two or more categories of workers.

The government which is presented as outside the labour market environment can directly via taxation and social security contributions, or indirectly via labour

market policies, influence the stocks and flows of workers in the labour market. Although the government has at its disposition a variety of passive and active measures, in our model we will pay attention only to the role of the passive labour market policies. Thus, the arrows from the government toward the labour market represent the policy instruments, whereas the arrows going toward the government represent the feed back effects from labour market responses. As the relevant source of budget revenues in the model we consider payroll taxes and social security contributions from formal employment. On the other hand, government expenditures in the sphere of the labour market mostly consist of expenditures on unemployment benefits and other social programmes that cover the inactive population, such as early retirement schemes and disability pensions. The degree of enforcement of the rule of law in the model will be associated with the intensity of monitoring that the government imposes on enterprises in order to detect those who do not comply with labour regulations *i.e*. do not pay the payroll tax and social contribution for their workers.

The development of the model of sustainable rate of unemployment will be based on a critical assessment of the optimal speed of transition models (Aghion and Blanchard, 1994; Blanchard, 1997; Bouev, 2004; Bruno, 2005; Tichit, 2006) and comparisons with models based on matching functions (Boeri, 1999; Boeri and Garibaldi, 2002; Garibaldi and Wasmer, 2003; Boeri and Garibaldi, 2005; Wasmer, 2006).[37] These two types of models are particularly susceptible to modelling labour market reality in transition countries because they focus on flows of workers and their sectoral reallocation. However, we have already mentioned the inappropriateness of OST models in describing labour market outcomes in more advanced phases of transition, where private employment takes a dominant role in the economy and in which flows to and from the state sector become less important. In order to capture the duality of labour markets in SEECs, instead of state and private employment our discussion above suggests that it is actually more suitable to distinguish between formal and informal employment. In what follows, according to actual labour market behaviour in SEECs we are going to develop first a structural model that will be used for a comparative static analysis of the determinants of the sustainable rate of

[37] The model based on matching function was originally developed by Mortensen and Pissarides (1994); for more advanced application see Pissarides (2000); for a survey literature see Petrongolo and Pissarides (2001).

unemployment defined in Chapter 2 (section 2.4.1) and then a dynamic model that will be used for an analysis of the labour market evolution.

7.2.1 The value functions

Employment in the domestic labour market can take one of the two possible forms: formal employment (E^f) or informal employment (E^i). Alternatively, a worker in the domestic labour market can be unemployed (U) or can drop out of labour force and become inactive (I). Thus, E^f, E^i, U, and I represent the number of workers in each of the aforementioned labour market states.

Most of the OST models utilised value functions associated with different labour market states (Aghion and Blanchard, 1994; Blanchard, 1997; Bouev, 2004; Bruno, 2005; Tichit, 2006). Other models were based on matching functions analysing the values of occupied and vacant jobs (Boeri, 1999; Boeri and Garibaldi, 2002; Garibaldi and Wasmer, 2003; Boeri and Garibaldi, 2005; Wasmer, 2006). We denote with V^{Ef}, V^{Ei}, V^U and V^I as the values of being employed in the formal sector, employed in the informal sector, unemployed and inactive respectively in terms of expected utility. We can express them as the present-discounted values of future utility streams as represented in equations (7.1), (7.2), (7.3) and (7.4). Having in mind our assumed universe of four possible labour market states, our model represents an improvement on previous models that do not account for the possibility of informal employment (Bruno, 2005; Tichit, 2006) or inactivity (Bouev, 2004).

$$rV^{Ef} = w^f + \nu(V^U - V^{Ef}) + \frac{dV^{Ef}}{dt} \quad \ldots (7.1)$$

$$rV^{Ei} = w^i + \delta b_U + (\nu + \lambda)(V^U - V^{Ei}) + \frac{dV^{Ei}}{dt} \quad \ldots (7.2)$$

$$rV^U = b_U + p^f(V^{Ef} - V^U) + p^i(V^{Ei} - V^U) + \frac{dV^U}{dt} \quad \ldots (7.3)$$

$$rV^I = b_I + \varepsilon_i + \frac{dV^I}{dt} \quad \ldots (7.4)$$

where the notation has the following meaning:

r - discount factor

w^f, w^i - market wages in the formal/informal sector

b_U - unemployment benefit

b_I - benefit whilst inactive such as pension or social assistance

ν - adverse economic shock leading to job loss

λ - effect of government's monitoring on job destruction in the informal sector

δ - probability of a worker employed in the informal sector receiving unemployment benefit

p^f, p^i - probabilities of an unemployed worker getting a job in the formal/informal sector

ε_i - idiosyncratic preferences of the individual *i* toward inactivity

According to equation (7.1) the discounted present value of utility from being employed in the formal sector is equal to the utility drawn from the wage, w^f, less the expected loss from losing the job and becoming unemployed plus the change in the value of being formally employed over time. Similarly, from (7.2) the utility of being employed in the informal sector is equal to the utility drawn from the wage, w^i, augmented by the possible returns from receiving unemployment benefit less the expected loss from losing their job and becoming unemployed plus the change in the value of being informally employed over time. In this context, we exclude the possibility that those employed in the informal sector could directly find formal employment and vice-versa, which implies that all transfers of workers between these two sectors are through unemployment. The parameter δ captures the phenomenon of moral hazard among the informally employed who may additionally gain utility from registering as unemployed and thus receiving unemployment benefits. This is in accordance with our findings in Chapter 1, where employment in the informal sector has been pointed out as a likely source of disparity between LFS and registered unemployment (Chart 1.1). For a worker employed either in the formal or in the informal sector we assume that job loss due to the adverse economic shock or caught not complying with the labour regulation is automatically followed by transfer into unemployment. The parameter λ can be considered as a policy instrument that captures the enforcement of employment laws. Consequently, workers in the informal sector face a higher probability of job loss, because they encounter the adverse economic shock common for both sectors augmented by government intervention in the informal sector.

According to equation (7.3) the discounted present value of utility of being unemployed is assumed equal to the utility drawn from the unemployment benefit b_U plus the possible increase in utility from transferring into formal or informal employment. This implies that the value of being employed in the formal sector is higher than the value of being employed in the informal sector, whereas both are higher than the value of being unemployed as presented by expressions (7.5) and (7.6):

$$V^{Ef} = V^U + c^f \quad \ldots (7.5)$$

$$V^{Ei} = V^U + c^i \quad \ldots (7.6)$$

We assume that c^f and c^i are constant over time and satisfy the conditions: $c^f > c^i$, $c^f > 0$, $c^i > 0$. They can be also considered as proxies for the opportunity cost of being unemployed relative to employed worker either in the formal or informal sector.

The utility of being inactive from (7.4) is equal to the utility drawn from benefits such as early retirement, disability pension or social assistance augmented by the term ε_i, which represents the idiosyncratic preference of a generic worker *i* toward inactivity plus the change in the value of being inactive over time. In our model we do not consider the possibility that the inactive directly transfer into formal or informal employment, neither do we allow the possibility that those who lose their jobs go directly into inactivity. We assume that all transfers from employment to inactivity and vice-versa pass through unemployment, the mechanism according to which those who leave employment are redistributed between unemployment and inactivity will be introduced in the later dynamic analysis.

7.2.2 Market wages

The formulation of market wages will be derived from the interactions between employment either in the formal or informal sector and unemployment. We assume that there exists a reservation wage equal to the utility that workers enjoy from the various entitlements they benefit from being unemployed or non-participants *i.e.* the minimum wage that workers can accept (Chapter 5, section 5.2.1). However, the market wage also comprises a compensation arising from the disutility of work. In this context, we follow the reasoning of Kingdon and Knight (2006) who find out that

in depressed labour markets local wage determination takes non-searching workers into account as potential labour force participants.[38] Thus, market wages in the formal and informal sector will be derived from the differences in expected utilities between an employed in the formal/informal sector and an unemployed worker. By differencing (7.1) and (7.3), and substituting (7.5) and (7.6) we can obtain the expression for the market wage in the formal sector:

$$w^f = b_U + (r+\nu)c^f + p^f c^f + p^i c^i \qquad \ldots (7.7)$$

Similarly, by differencing (7.2) and (7.3), we can obtain the expression for the market wage in the informal sector:

$$w^i = (1-\delta)b_U + (r+\nu+\lambda)c^i + p^i c^i + p^f c^f \qquad \ldots (7.8)$$

We notice that the terms: $\frac{dV^{Ef}}{dt}$, $\frac{dV^{Ei}}{dt}$ and $\frac{dV^{U}}{dt}$ do not appear in equations (7.7) and (7.8), since the conditions (7.5) and (7.6) imply $\frac{dV^{Ef}}{dt} - \frac{dV^{U}}{dt} = 0$ and $\frac{dV^{Ei}}{dt} - \frac{dV^{U}}{dt} = 0$, when *t* is a small time interval.

7.2.3 Job creation functions

In our model the demand for new workers in the formal and informal sectors can be derived from the assumption that firms invest in the creation of new jobs from retained profits, *i.e.* the difference between the value of the average net product per worker and average wage, regardless of the sector in which the firm operates. We make this assumption according to the empirical evidence that borrowing is not generally possible due to the undeveloped financial markets in less developed transition countries (Bouev, 2004). Therefore, the fraction of retained profits per worker can be used as a proxy for the proportion of newly created jobs in the formal sector by additionally accounting for relevant institutional characteristics:

$$J^f = a^f \left[y^f (1-\tau) - w^f \right] \qquad \ldots (7.9)$$

[38] Kingdon and Knight (2006) consider the non-searching workers as being marginally attached to the labour force due to the phenomenon of 'discouraged workers'.

where y^f is the gross average product per worker in the formal sector, while parameter a^f captures various institutional factors or government policies that influence job creation in the formal sector such as the level of corruption or bribes. For convenience we can assume that this parameter can take values from the interval (0,1). In a favourable economic environment a^f is close to 1, which implies that firms in the formal sector use nearly their entire profit for investment and thus the creation new jobs for additional workers. The parameter τ represents the payroll tax rate imposed on employment in the formal sector, which is used in order to derive the net average product per worker in the formal sector, $y^f(1-\tau)$. Later this tax rate will be endogenised by introducing a budget constraint. According to (7.9) the rate of job creation in the formal sector will therefore be: $J^f E^f$.

Similarly, the job creation in the informal sector as a function of retained amount of profit per worker would have the following form:

$$J^i = a^i(y^i - w^i) \qquad \ldots (7.10)$$

where, y^i is the average product per worker in the informal sector, and the parameter a^i captures the respective institutional factors or government policies that influence job creation in the informal sector. We can provide similar arguments as in the case of the job creation in the formal sector about the possible values that the parameter a^i can take. In short, any value of a^i close to 1 implies an economic environment which is favourable for job creation in the informal sector such as low enforcement of the rule of law. According to (7.10) the rate of job creation in the informal sector will therefore be: $J^i E^i$. The job creation rates in both sectors in our further analyses will be expressed on a yearly basis. Having in mind the findings presented in Chapter 4 (section 4.4.3) about the productivity of the formal and informal employment, we assume that the average product of the workers in the formal sector is higher than the average product in the informal sector, *i.e.* $y^f > y^i$.

In order to express job creation functions and market wages as functions of the number of workers in unemployment, employment in the formal sector and employment in the informal sector, we solve the system of equations (7.7), (7.8), (7.9) and (7.10). Furthermore, assuming that all new jobs created in the formal sector

are filled by unemployed workers we use an expression for the probability of getting a job in the formal sector p^f as defined in (7.11).

$$p^f = J^f \frac{E^f}{U} \quad \ldots (7.11)$$

In a similar vein, by assuming that all jobs created in the informal sector are also filled by unemployed workers we use an expression for probability of getting job in the informal sector p^i as defined in (7.12).

$$p^i = J^i \frac{E^i}{U} \quad \ldots (7.12)$$

The formal solution of the system of equations (7.7), (7.8), (7.9) and (7.10) together with the appropriate replacements from (7.11) and (7.12) is presented in Appendix 7.1. For this purpose we have used the software package *Mathcad.*

7.2.4 Modelling the participation decision

Following the work of Bruno (2005), we model the participation decision of a given worker according to the value of his/her idiosyncratic term ε_i which is a stochastic term distributed according to the density function $f(\varepsilon)$. For convenience we assume that ε_i is normalised, *i.e.* it can take any value from the interval $[0,1]$. An indifferent worker has an idiosyncratic term $\bar{\varepsilon}$, which represents a borderline in preferences between the status of unemployment and inactivity. Thus, we can express this term from the equality $rV^U = rV^I$ as presented in (7.13):

$$\bar{\varepsilon} = b_U - b_I + p^f c^f + p^i c^i \quad \ldots (7.13)$$

From (7.13) we notice that the participation decision depends on the difference between the average unemployment benefit and the average benefit from inactivity augmented by the employment probabilities in the formal and informal sector. Thus, we would expect that *ceteris paribus* higher unemployment benefits relative to benefits from inactivity will attract more workers to participate in the labour force. A similar effect would be exerted by increasing probabilities of employment in the formal and informal sector which ultimately depend on the levels of job creation.

For a generic worker *i* previously employed in the formal or informal sector, it is possible to determine whether he will transfer into employment or inactivity by

simple comparison of his idiosyncratic term ε_i with that of an indifferent worker. If $\varepsilon_i < \bar{\varepsilon}$, the worker will transfer from employment to unemployment. In contrast, if $\bar{\varepsilon} < \varepsilon_i$ the worker will transfer from employment to inactivity. The above-stated criterion for participation is straightforward and similar to the criterion used in the models based on a matching function where the latter operate with two cut-off points: one, at the point of indifference between quitting and staying in the job, whereas the other at the point of indifference between entering the labour force or staying out of labour market participation (Garibaldi and Wasmer, 2003; Wasmer, 2006). The formulated criterion for participation decision will be used later in our simulations of the labour market dynamics in section 7.4.

7.2.5 Budget and boundary constraints

In order to introduce government policy instruments into the determinants of the level of job creation in the formal and in the informal sector we formulate the government's budget constraint. Suppose that the government impose a payroll tax at rate τ on employment in the formal sector. According to the adopted definition of sustainability in Chapter 2, the government budget constraint requires that unemployment benefits and benefits for inactive the population are entirely financed by the payroll tax receipts from formal employment. Consequently, the budget constraint has the following expression:

$$Ub_U + Ib_I = E^f \tau \qquad \ldots (7.14)$$

The budget constraint as stated in (7.14) implies normalisation of the population of working age to one. This means that the number of workers in the four aforementioned possible labour market states (formal employment, informal employment, unemployment and inactivity) sum up to one:

$$E^f + E^i + U + I = 1 \qquad \ldots (7.15)$$

By using the boundary constraint specified in (7.15) we overcome one of the major weaknesses of the OST models that generally assume a constant labour force (Boeri, 2000). In fact, as we stressed in Chapters 1 and 5, alongside declining employment the labour force has also declined in most of transition countries due to increased movements of workers into inactivity. Therefore, our model allows for

including the outside options *i.e.* captures the aforementioned flows, thus making our modelling of the labour market outcomes in SEECs more realistic.

The above-outlined model can be further calibrated by using numerical values for the parameters. Subsequently, we carry out two separate analyses: first, a comparative static analysis which gives information about the structural relationships between variables under consideration and second, dynamic analysis which enables the assessment of labour market evolution over time.

7.3 Comparative static analysis

Our numerical simulations of job creation functions in the formal and informal sector have the purpose of identifying the impact of key policy parameters on the intensity and distribution of job creation in the domestic labour market. In order to calibrate the model base line values of the parameters will be chosen in accordance with labour market behaviour in SEECs and particularly in Macedonia analysed above. Furthermore, various experiments with different policy regimes will identify their impact on labour market outcomes and the behaviour of the various labour market adjustment mechanisms. The values of the parameters that are used for calibration of the model are presented in Table 7.1. In the upper panel of Table 7.1 are listed the parameters common for both sectors, whereas in the lower panel are given the parameters that differ between the formal and informal sector.

Table 7.1 Base line values of the parameters used for simulation

Common parameters for both sectors		
discount factor	$r = 0.05$	
average benefit of unemployed worker	$b_U = 0.25$	
average benefit from inactivity	$b_I = 0.15$	
probability of receiving unemployment benefit	$\delta = 0.35$	
adverse economic shock leading to job loss	$\nu = 0.05$	
Effect of government's monitoring	$\lambda = 0.03$	
Parameters that differ between sectors	Formal sector	Informal sector
average product per worker	$y^f = 1$	$y^i = 0.7$
relative opportunity cost of unemployment	$c^f = 1$	$c^i = 0.8$
job creation reactivity to retained profit	$a^f = 0.3$	$a^i = 0.1$

We chose to operate with discount factor of 0.05, which is in the range of values used in similar analyses. For instance, Garibaldi and Wasmer (2003) and Boeri and Garibaldi (2005) allow for a wider time horizon by using discount factor 0.005 and 0.03 respectively, whereas Bouev (2001), Bouev (2005) and Tichit (2006) operate with value 0.1. We next justify our choice of the base line values of the remaining parameters in Table 7.1 with respect to the analyses in the previous chapters.

The chosen unemployment benefit parameter b_U is 25 percent of the average wage in the formal sector, which corresponds to the low level of generosity of unemployment benefits in Macedonia as well as their low coverage (Chapter 1, section 1.6.4). This parameter is conceived as a composite indicator which includes both the financial benefits and other entitlements such as health insurance. In this context, our chosen value for the level of unemployment benefits lays within the range of values used by other authors. For example, Tichit (2006) uses a value of 0.1; Boeri (1999) operates with 0.35; whereas Bouev (2001) allows for a value of 0.5. The value for the parameter δ representing the probability of a worker employed in the informal sector receiving unemployment benefit is chosen according to our estimation of the sources of the difference between the LFS and registered unemployed in Macedonia (Chapter 1, Figure 1.9). With respect to the previous analysis, the value for δ reflects our conclusion that more than one third of the informally employed in Macedonia register as unemployed in order to exploit the possibility of receiving unemployment benefits or take advantage of other entitlements. In addition, we chose the value of the average benefit from inactivity to be 0.15, which is consistent with our previous findings that benefits received by the inactive are lower than the unemployment benefits. It is noteworthy that we do not account for time limitations in receiving unemployment benefits, neither for the generally open-ended character of the inactivity benefits.

In our model job destruction is treated as exogenous and constant over time. All firms in the formal sector each period are assumed to face adverse economic shock that cause 5 percent of the employed to lose their jobs and become unemployed. This assumption is mainly based upon the empirical findings about the demand for labour in Macedonia (Chapter 3 above). The rate of job destruction chosen in our study is also comparable with those found in other similar studies. For

instance Tichit (2005) uses a value of 0.05; Bouev (2001) operates with job destruction rate of 0.06, whereas (Bouev, 2004) uses value of 0.1. Additionally, we assume that those employed in the informal sector face a 3 percentage points higher job destruction rate due to the probability of their employers or themselves being caught not complying with labour regulations. In our analysis job destruction rates as in the case of job creation rates are expressed on a yearly basis, according to the available labour market data.

We further calibrate the parameters that differ between the two sectors (lower panel of Table 7.1). In order to distinguish the level of productivity in the formal sector from that in the informal sector, we assume that the average product in the informal sector is 30 percent lower than in the formal sector. Therefore, we set the average market products in the formal and informal sector to be 1 and 0.7 respectively. This assumption is based on the findings in Chapter 4 (section 4.4.3) about the subsistence characteristic of much of the informal sector. Furthermore, we set the opportunity costs of being unemployed relative to employment in the formal or informal sector to 1 and 0.8 respectively. This assumption is directly derived from the previous assertion that workers in the formal sector receive higher wages and enjoy higher job security than workers in the informal sector. Finally, we assume that the sensitivity of job creation to retained profit is low in both sectors reflecting the insufficient job creation in the case of a depressed labour market. However, we further assume that a^f is higher than a^i and set them to 0.3 and 0.1 respectively. These assumptions are based on the empirical findings according to which firms in the formal sector have greater investment opportunities arising from the advantages of their legal functioning (Loayza, 1997). For example, participation in the formal sector can bring various benefits such as government subsidies, various training programmes publicly provided for employees, the possibility of contract enforcement etc. Some authors experiment with different values trying to mimic two different types of labour markets *i.e.* those of the 'advanced reformer' and 'lagging reformer' (Bouev, 2004; Tichit, 2006). In our case, instead of distinguishing between the different types of labour markets, we attempt to calibrate the model with respect to the characteristics of a depressed labour market typical of the less developed transition countries.

The above-developed structural model yields several testable results that will be discussed in the remainder of this section. First, at a lower rate of unemployment job creation in the formal sector is higher than job creation in the informal sector with a tendency for this to be reversed when unemployment is high. Second, market wages in both sectors are continuously declining with unemployment. Third, the probability of exiting the labour force increases as unemployment increases. Fourth, different policy regimes may result in different labour market equilibria ranging between two extreme cases: 'good' and 'bad' equilibria.

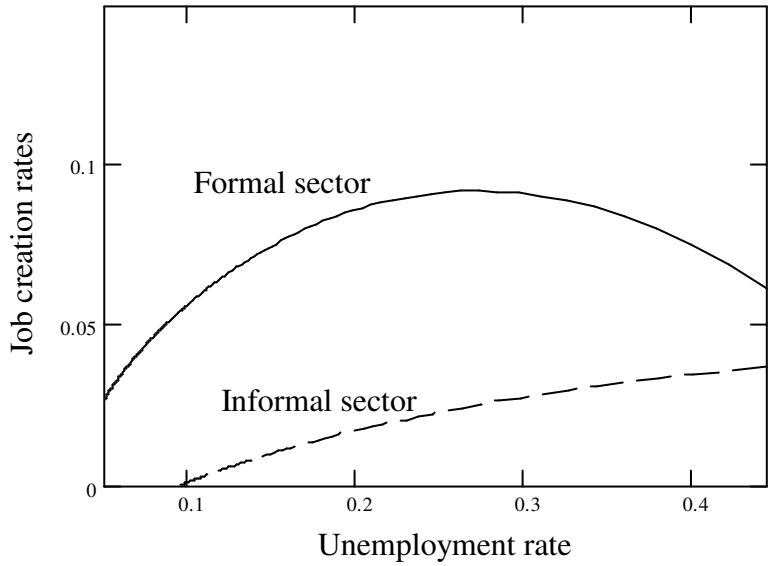
7.3.1 The relationship between unemployment and job creation

By using the specified values for the parameters, in this section we explore the interdependence between the unemployment and job creation functions. According to the formal solution of the system in Appendix 7.1, job creation rates in the formal and informal sector can be expressed as functions of the unemployment rate, graphically presented in Figure 7.2. It is noticeable that the job creation function in the formal sector is a parabolic function (solid line in Figure 7.2). It is increasing at a lower rate of unemployment, but decreasing at a higher rate of unemployment. In contrast, the job creation function in the informal sector is an increasing function of unemployment (dashed line in Figure 7.2). We are assuming that the burden from labour taxation on employment in the formal sector increases proportionately with the increase in unemployment, thus creating a crowding-out effect on job creation in the formal sector and a subsequent increase in newly created jobs in the informal sector.

At a lower rate of unemployment, job creation in the formal sector is relatively more attractive than job creation in the informal sector because of the low cost of the welfare programmes for the unemployed, which subsequently imply low taxation. In this situation, the benefits from complying with labour regulation in the formal sector outweigh the benefits from avoiding these low taxes in the informal sector. At a higher rate of unemployment, the tax burden becomes higher, which in turn slows down job creation in the formal sector, but has the opposite effect on job creation in the informal sector. Therefore, at a higher rate of unemployment, job creation in the informal sector approaches the job creation in the formal sector. In the hypothetical case of an extremely high unemployment rate, we expect that job creation in the formal sector may become even lower than job creation in the informal

sector. This result is in accord with our theoretical assumptions about the counter-cyclical characteristics of employment in the informal sector presented in Chapter 4 (section 4.2.6).

Figure 7.2 Job creation functions in the formal and informal sector



We carry out further simulations with different values of the parameters in order to determine their impact on the job creation functions. Hence, a more stringent enforcement of the rule of law corresponding to higher government's monitoring in the informal sector (λ), holding everything else constant, results in a downward shift of the job creation function in that sector. For instance, our simulation shows that at a 35 percent unemployment rate an increase of λ from 0 to 0.5 *ceteris paribus* would decrease the job creation rate in the informal sector from 3.4 percent to 3 percent. This shift in job creation function in the informal sector is illustrated in the upper panel of Appendix 7.2, where the arrow indicates the direction of shift. A similar effect in terms of direction of shift is obtained by a decrease in the probability of an informally employed worker receiving unemployment entitlements (δ).

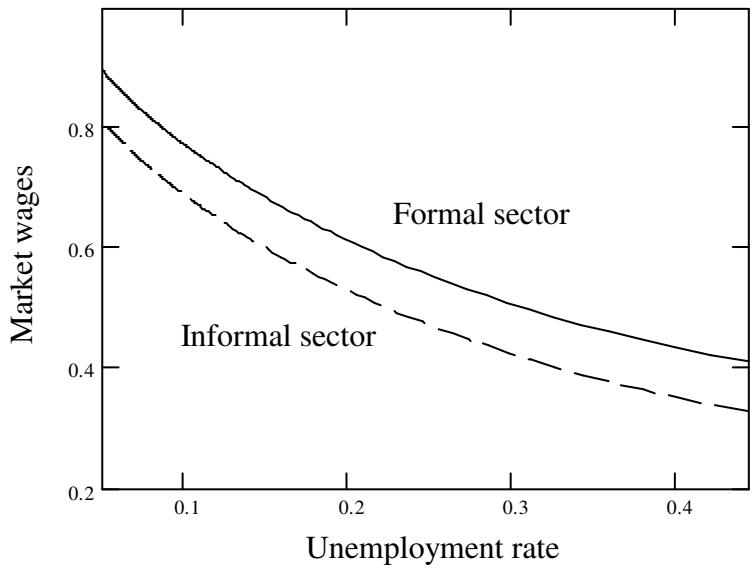
On the other hand, a reduction in unemployment benefits (b_U) results in an upward shift in the job creation function in the formal sector alongside negligible changes in the job creation function in the informal sector. For instance, at a 35 percent unemployment rate a reduction of b_U from 0.25 to 0.2 *ceteris paribus* would increase the job creation rate in the formal sector from 8.6 to 10.7 percent. This shift in job creation function in the formal sector is illustrated in the lower panel of Appendix 7.2, where the arrow indicates the direction of shift. Although instructive

for estimating the possible magnitudes and directions of impact, we are still not able to use these findings in drawing inferences about the appropriate policies because they do not account for labour market flows and the corresponding labour market dynamics. Hence our comparative static analysis of the labour market will be further extended in section 7.4 by considering the labour market evolution and possible policy implications.

7.3.2 The relationship between unemployment and market wages

As we have demonstrated in section 7.2.2, market wages in both sectors are simultaneously expressed together with job creation functions. By using the calibrated values of the parameters in Table 7.1, we can illustrate the relationship between the unemployment rate and the ratios of the market wages in each of the sectors relative to the average products per worker (Figure 7.3). We notice that in both sectors average market wages relative to the average products per worker are declining functions of unemployment. The average market wage in the formal sector (represented by the solid line) is higher than the average market wage in the informal sector (represented by the dashed line), which reflects the assumed differences in productivity between these two sectors. This result is in accordance with our underlying theoretical framework which assumes that an increase in unemployment exerts downward pressure on wages in both sectors.

Figure 7.3 Average market wages relative to market products per worker



Assuming constant elasticities, we obtain the elasticity coefficients from the simple regressions of log wages on log unemployment rate. According to our simulations, the estimated wage elasticities in the formal and informal sector with respect to the unemployment rate are -0.38 and -0.44 respectively, and both are statistically significant. The results from this estimation are presented in Appendix 7.3 (panels A and B). From the estimated elasticity coefficients we conclude that the wage formation in the informal sector is more responsive to the labour market conditions than is the wage formation in the formal sector. The higher elasticity of wages in the informal sector relative to the formal sector can be either attributed to the absence of employment protection in the informal sector or the lower level of human capital accumulation in this sector that renders a downward adjustment of wages more feasible.

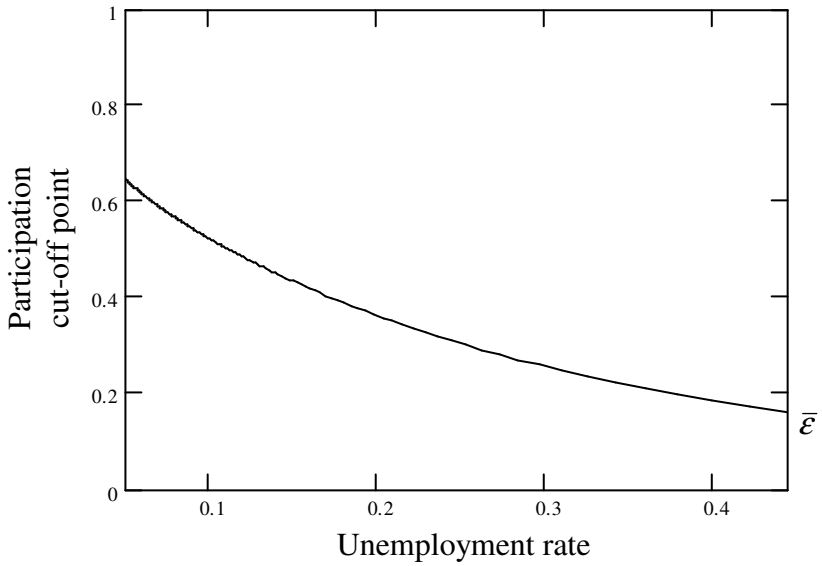
Our results about the relationship between unemployment and market wages are also consistent with the theoretical fundamentals established in the 'wage curve' (Blanchflower and Oswald, 1995). Moreover, the empirical findings throughout the transitional world have confirmed that a high unemployment rate operates as a discipline device among incumbent workers and therefore exerts downward pressure on wages (Blanchflower, 2001; Tichit, 2006). Alternatively, Kollo and Mickiewicz (2005) explain this relationship by the changing bargaining power of workers with respect to the changes in their outside options. The latest contribution that is consistent with this finding is Bornhorst and Commander's (2006) analysis of regional unemployment in several transition countries which finds a strong negative association between regional unemployment and the relative rate of wage increase.

7.3.3 The relationship between unemployment and participation decision

As demonstrated in Chapter 5, the decision to participate in the labour force is complex and depends on various individual, household and contextual characteristics. However, in our model we attempt to simplify this issue by relating it to the general labour market conditions summarised in the unemployment rate. According to the participation decision modelled in section 7.2.3, we can further simulate the relationship between the unemployment rate and the idiosyncratic term of an indifferent worker by using the parameter values from Table 7.1. This relationship is

presented in Figure 7.4, from which it is observed that $\bar{\varepsilon}$ continually decreases as the unemployment rate increases.

Figure 7.4 The relationship between unemployment and participation decision



From Figure 7.4 we see that $\bar{\varepsilon}$ is high when the unemployment rate is low, and continually decreases as unemployment rate increases. Therefore, a low unemployment rate is associated with a higher likelihood of a worker exiting from employment becoming unemployed *i.e.* remaining within the labour force rather than becoming inactive. In the opposite case, $\bar{\varepsilon}$ takes lower values when unemployment is high, thus making it more likely that the inequality $\bar{\varepsilon} < \varepsilon_i$ holds. Consequently, in the case of high unemployment the likelihood of a worker quitting employment to drop out of the labour force increases (Bruno, 2005). According to our simulation, the estimated elasticity of $\bar{\varepsilon}$ with respect to the unemployment rate is -0.65, indicating that one percentage point increase in the unemployment rate is associated with a decrease in the average probability of those quitting employment to remain within the labour force of 0.65 percentage points. The results from our estimation are presented in the bottom panel of Appendix 7.3 (panel C). Our obtained result is consistent with the empirical findings that illustrate significant positive association between high levels of unemployment and non-participation in Macedonia (Chapter 5, section 5.4.3).

7.3.4 The possibility of multiple equilibria outcomes

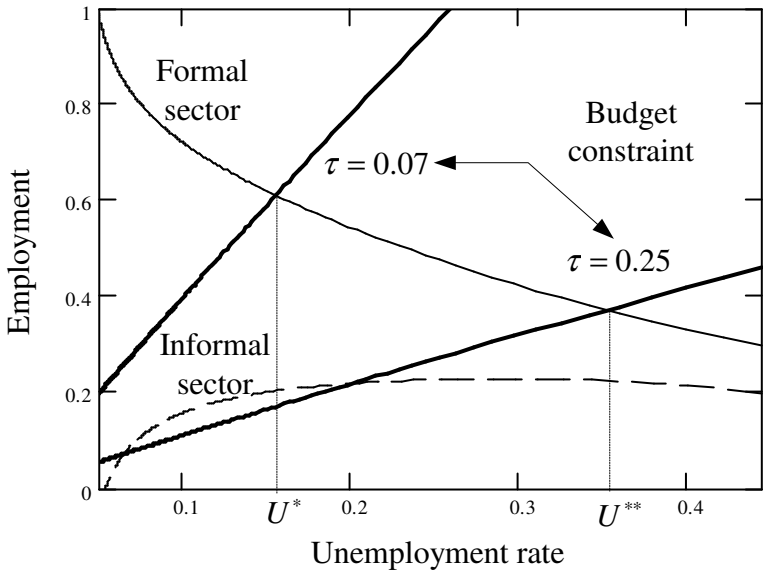
The adoption of various policies related to the generosity of unemployment benefits, enforcement of the rule of law as well as the level of taxation imposed on employment in the formal sector affect labour market outcomes. In Figure 7.5 we depict the relationship between employment (in both formal and informal sector) and unemployment. Similar to the previous results, this relationship is derived from the base line values of the parameters presented in Table 7.1 and by modelling the changes that occur according to the job creation functions (section 7.3.1). Employment in the formal sector continually decreases as unemployment increases, while there is an obvious increasing tendency of employment in the informal sector, which is in accordance with our previous empirical findings of significant positive association between unemployment rate and the size of the informal sector in SEECs (Chapter 4, Table 4.4).

Furthermore, from Figure 7.5 we notice that at low levels of unemployment the allocation of labour to the formal sector dominates over the informal sector. The opposite is true at high levels of unemployment. In addition, two different budget constraint lines have been drawn for the hypothetical cases of low taxation encompassing both the payroll tax and social security contributions ($\tau = 0.07$) and high taxation ($\tau = 0.25$) imposed on employment in the formal sector. The difference between the labour cost to the employer and net pay of the employee, known as the tax wedge is one of the commonly assumed factors that determine the sustainable rate of unemployment. Other things being equal, a higher tax wedge increases the sustainable rate of unemployment by decreasing labour demand because of higher total costs of employing labour, and labour supply because of lower net pay. Moreover, a higher tax wedge makes it more attractive to work in the informal sector.

The budget constraint line for a given tax rate determines the required level of employment in the formal sector for covering the unemployment benefits and expenses for covering the social programmes for inactive population according to equation (7.14). The slope of the budget constraint line associated with the lower tax rate is steeper, since it assumes the need for a wider tax base. In the case when the tax rate is high, the slope of the budget constraint line is flatter. The sustainable rates of unemployment are determined by the point of intersection between the employment in the formal sector and the budget constraint line for a given tax rate. This is

consistent with the definition of sustainable rate of unemployment that we derived in Chapter 2 (section 2.4.1). Each of these two hypothetical cases is associated with a corresponding employment structure which comprises proportions of employment in the formal and informal sector.

Figure 7.5 Employment in the formal and informal sector



From Figure 7.5 we notice that at lower tax rates the sustainable rate of unemployment U^* is lower. Moreover, this unemployment rate is associated with a favourable employment structure, where employment in the formal sector is significantly higher than employment in the informal sector. On the other hand, at a high tax rate, the sustainable rate of unemployment U^{**} is higher and coupled with an unfavourable employment structure in terms of considerably higher relative share of employment in the informal sector. Therefore, according to the above result the possibility of multiple sustainable rates of unemployment is embedded in our structural model.

The idea of multiple equilibria outcomes in transitional labour markets is not new. There are a number of authors that treat the issue of multiple equilibria in transitional labour markets (Burda, 1993; Minniti, 1995; Johnson et al., 1997; Roland, 2000; Rosser et al., 2003). Most of these concentrate on analysing the 'high-unemployment trap' that some transition countries experienced after the initial transitional shock. The reasons for entrapment in the so-called 'bad equilibrium' can be either generous unemployment benefits inducing high taxation in the formal sector

(Burda, 1993), a prohibitive tax system as perceived by employers, a high corruption burden and/or inadequate provision of public goods (Johnson et al., 1997; Rosser et al., 2003), weak enforcement of law (Roland, 2000) or a consequence of the social-psychological effects of the stigma attached to the unemployed (Sessions, 1994). In the next section, we analyse the dynamics of the labour markets and possibilities of ending-up in a 'bad' or 'good' equilibrium.

7.4 Dynamic analysis

The dynamics of the labour market can be modelled by using differential equations. A full description of the labour market dynamics implies the need for identification of all possible transition probabilities among the four possible labour market states. However, such an approach would render the model highly complex. For illustration, a model of labour market dynamics in the case of three labour market states is outlined in Appendix 7.4. Since, in our model we deal with four possible labour market states, we should construct four differential equations that describe the changes in each of them. Assuming constant transition probabilities between the labour market states the labour market dynamics can be modelled by using Markov stochastic processes. An application of Markov stochastic processes in modelling the labour market dynamics for Macedonia is presented in Appendix 7.5. For this purpose we use the estimated transition matrix according to our findings in Chapter 3 (section 3.4.2).

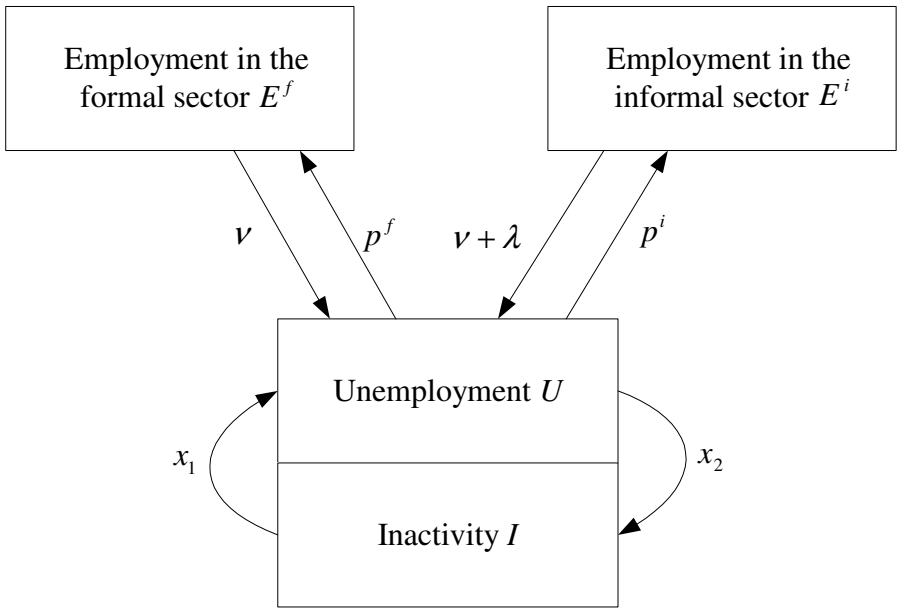
With respect to the aforementioned limitations, we proceed with formal dynamic modelling by taking into account only those transfers among the labour market states that have been identified as the most important in our previous analyses of the Macedonian labour market (Chapter 3). We particularly pay attention to the flows from employment to unemployment and vice-versa, as well as to the flows between unemployment and inactivity. A note of caution should be made concerning the difficulties of pursuing a dynamic analysis of the labour markets in transition countries. In this context, we have to account for at least two possible limitations. First, the rapidly changing economic environment in transition countries makes inappropriate the assumption about constant values of the parameters over time. Second, the short time series available are unlikely to provide reliable estimates, which exacerbate their use 'to compute the impulse-response functions where the

prediction horizon is longer than the sample time period' (Bornhorst and Commander, 2006, p.276). With this in mind, we will only use the dynamic analysis as a tool for identifying the possible directions of labour market development due to the changes in the policy parameters.

7.4.1 Specification of the dynamic model

In general, all flows in the labour market can be classified into two categories: those that occur within the labour force and those that occur between the labour force and out-of-labour force status. In order to capture both the transfers into and out of employment and those into and out of inactivity, we divide each time interval into two stages. In the first stage we model the changes within the labour force by assuming that all changes in employment occur as a result of transfers between employment and unemployment. Note that as in our comparative static analysis, we are ignoring direct flows between the formal and informal sectors, thus assuming that workers moving between these sectors go through a spell of unemployment. In the second stage we model the distribution between unemployment and inactivity. The above-outlined labour market dynamics is graphically presented on Figure 7.6.

Figure 7.6 A framework for modelling labour market dynamics



The change in employment in the formal sector in a given time interval is equal to the increase due to hires from the unemployed minus the decrease due to the

job destruction as a consequence of adverse economic shocks. This is formally presented in equation (7.16), where p^f is substituted from (7.11):

$$\frac{dE^f}{dt} = p^f U - \nu E^f = (J^f - \nu)E^f \quad \ldots (7.16)$$

Similarly, the change in employment in the informal sector in a given time interval is equal to the increase due to transfer from unemployment minus the decrease due to the job destruction in this sector. As we have assumed in section 7.2, in addition to the adverse economic shocks, the rate of job destruction in the informal sector is higher due to government monitoring. This is formally presented in equation (7.17), where p^i is replaced from (7.12):

$$\frac{dE^i}{dt} = p^i U - (\nu + \lambda)E^i = (J^i - \nu - \lambda)E^i \quad \ldots (7.17)$$

The change in unemployment in the first stage is equal to the increase as a result of job destruction in the formal and informal sectors minus the job creation in those sectors which induces outflows from unemployment. Furthermore, only a fraction x_1 of the net job creation will be filled by unemployed workers, whereas another fraction x_2 will be filled from the inactive population. We assume that $x_1 + x_2 = 1$, which means that the total net change in employment is compensated from unemployment and inactivity. Furthermore, this implies that direct job-to-job movements are not considered in the model. We determine the fractions x_1 and x_2 according to the participation decision modelled in section 7.2.3. For a given density function $f(\varepsilon)$ of the idiosyncratic term, these two fractions will be calculated as presented in (7.18) and (7.19):

$$x_1 = F_\varepsilon(\bar{\varepsilon}) = \int_0^{\bar{\varepsilon}} f(\varepsilon)d\varepsilon \quad \ldots (7.18)$$

$$x_2 = F_\varepsilon(1-\bar{\varepsilon}) = \int_{\bar{\varepsilon}}^{1} f(\varepsilon)d\varepsilon \quad \ldots (7.19)$$

We can assume various forms of the density function. In the most simplest case of the uniform distribution, the fractions will take values $x_1 = \bar{\varepsilon}$ and $x_2 = 1 - \bar{\varepsilon}$.

The changes in unemployment and inactivity are formally described by equations (7.20) and (7.21):

$$\frac{dU}{dt} = x_1\left[(\nu - J^f)E^f + (\nu + \lambda - J^i)E^i\right] \quad \ldots (7.20)$$

$$\frac{dI}{dt} = x_2\left[(\nu - J^f)E^f + (\nu + \lambda - J^i)E^i\right] \quad \ldots (7.21)$$

The total of all changes in the four labour market states in any given time period *t* is zero as presented with expression (7.22).

$$\frac{dE^f}{dt} + \frac{dE^i}{dt} + \frac{dU}{dt} + \frac{dI}{dt} = 0 \quad \ldots (7.22)$$

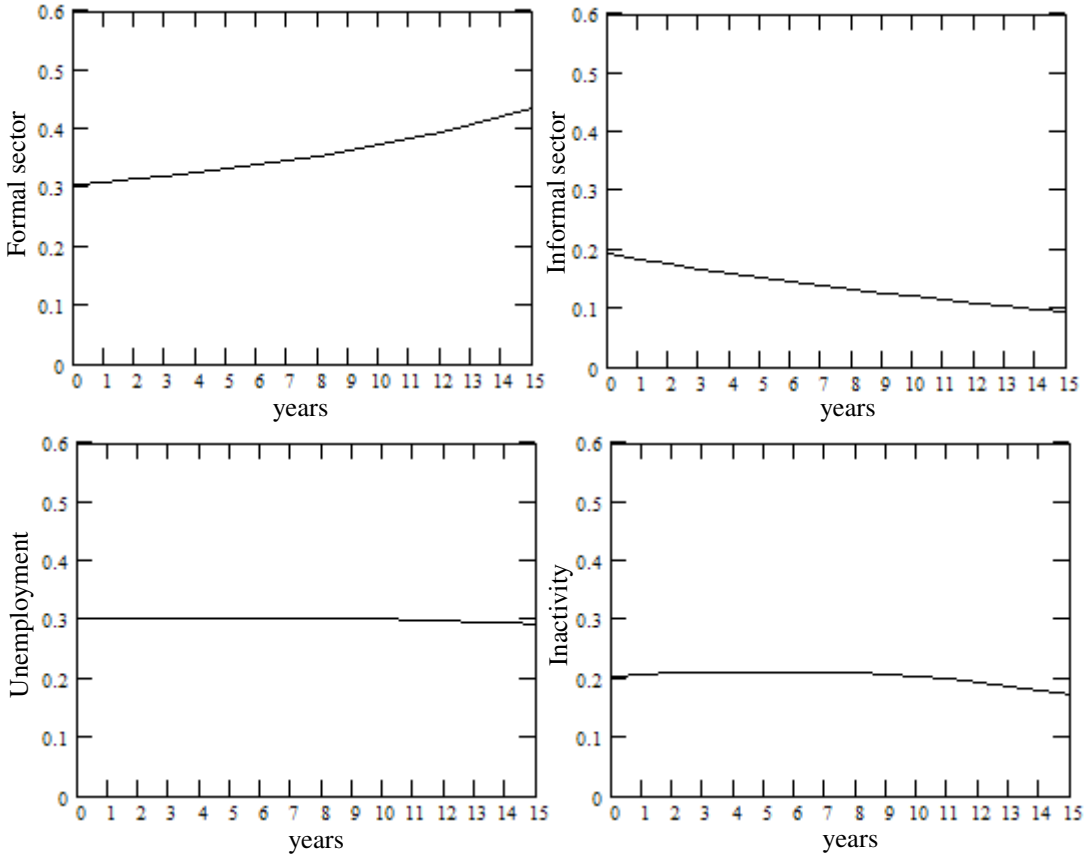
The expression (7.22) states the necessary condition that provides validity of the boundary constraint (7.15) for any given time period. Furthermore, according to this expression we do not take into consideration the possible changes in the size of the population of working age due to demographic changes, which restricts us to use the model only for a short time horizon. Our dynamic analysis is also limited to the flows occurring in domestic labour market without covering migration flows.

7.4.2 Simulation of the evolution of the labour market

By using the system of differential equations (7.16), (7.17), (7.20) and (7.21), with appropriate initial values for the four labour market states and the same values of the parameters as in the structural model (Table 7.1) we can simulate the evolution of the labour market during a certain time period. Given the anticipated shortcomings of our model we choose to simulate the labour market dynamics for a period of 15 years assuming that significant demographic changes over such time-span are less likely to occur. Furthermore, we use the following initial values for the four labour market states: E^f=0.3; E^i=0.2; U=0.3; I=0.2 which from our earlier discussion represent the characteristics of a depressed labour market with relatively high employment in the informal sector and high unemployment such as currently found in Macedonia. Finally, we decide to operate with a uniform probability distribution of the idiosyncratic preferences for inactivity as most simplistic approach. Using alternative functional forms for the density function $f(\varepsilon)$, such as the normal distribution, has not revealed significant differences in the modelled labour market dynamics. The

simulation of the evolution in each of the four above-described labour market sates with the chosen initial values and base line values of parameters is illustrated in Figure 7.7. In addition, the programming code in *Mathcad* used for simulations is presented in Appendix 7.6.

Figure 7.7 Dynamic simulations with the base line values of parameters

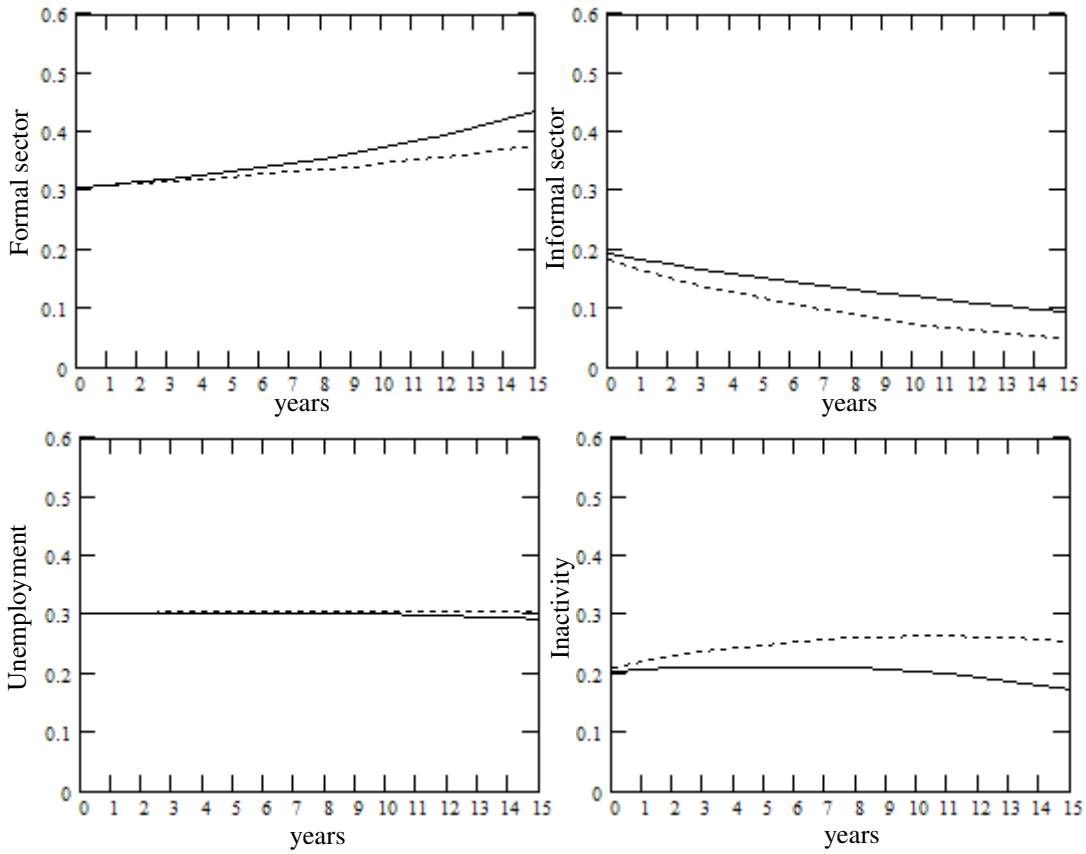


From the four panels in Figure 7.7 we observe that the assumed policy regime results in a high and persistent sustainable rate of unemployment coupled with a gradual increase in the formal sector occurring at expense of a declining informal sector. Although taking into account the anticipated problems of the dynamic approach of modelling in a transitional context, we further use the model for making inferences about the appropriateness of the policies aiming to improve labour market functioning. For this purpose we assume possibility of changes in four policy parameters: the average benefit of unemployed worker (b_U), the average benefit from inactivity (b_I), the adverse economic shock leading to job loss (ν) and the effect of government monitoring on employment in the informal sector (λ). According to the chosen values of the above parameters we can simulate at least two possible

development scenarios: first, the so-called 'pessimistic' scenario assuming an unchanged level of the adverse economic shock and second, the 'optimistic' scenario developed under the assumption of its reduced level. The 'pessimistic' scenario corresponds to the case of a depressed labour market, while the 'optimistic' scenario attempts to mimic favourable conditions of increased job creation.

According to the 'pessimistic' scenario, any policy aiming to reduce employment in the informal sector via more stringent application of the rule of law, associated with absence of additional job creation in the formal sector will result in either an increase in unemployment or inactivity. Which of these two adjustment mechanisms prevails depends on the generosity of the policies that target the unemployed and the inactive population. This is illustrated by the dynamic simulations in Figure 7.8, where the evolution of the labour market is pursued under two different policy regimes.

Figure 7.8 Dynamic simulations under the 'pessimistic' scenario



The solid lines in Figure 7.8 correspond to the original simulation with the base line values of parameters ($b_U = 0.25$; $b_I = 0.15$; $\nu = 0.05$; $\lambda = 0.03$), whereas

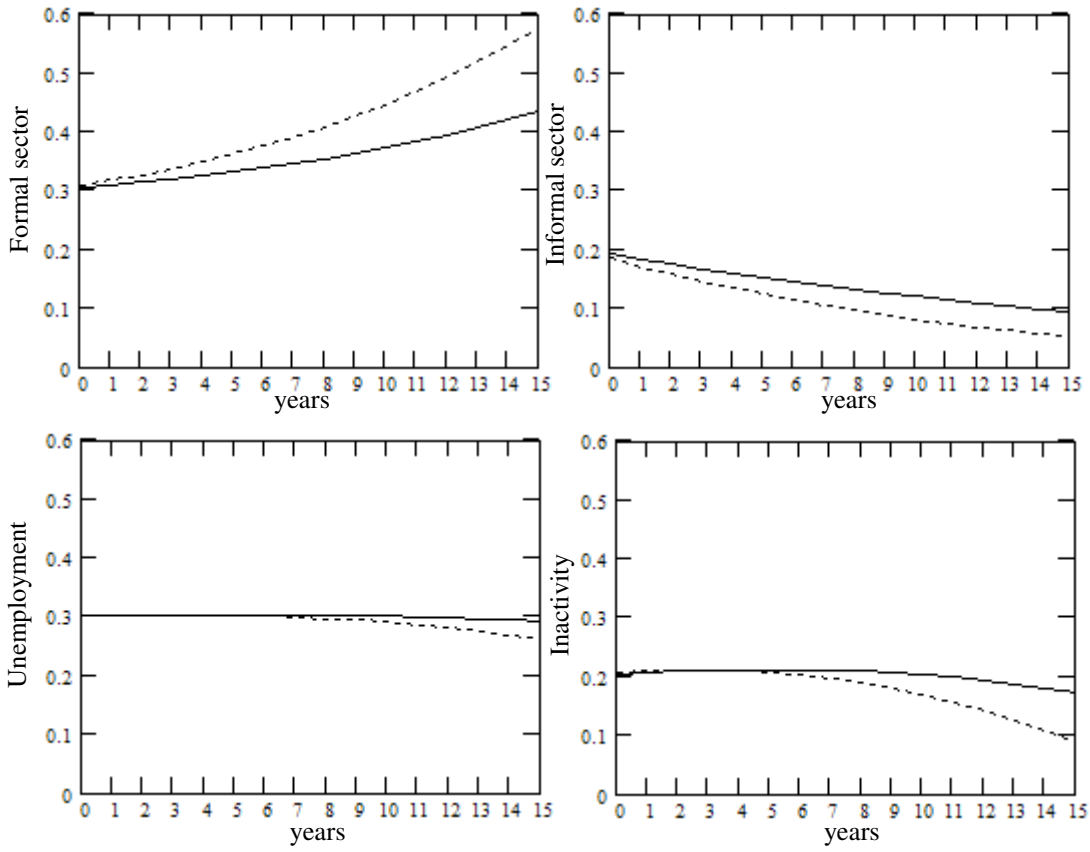
dotted lines correspond to the policy regime consisting of the following values of parameters: $b_U = 0.23$; $b_I = 0.22$; $\nu = 0.05$; $\lambda = 0.07$. We notice that the second policy regime is associated with increased monitoring in the informal sector from 0.03 to 0.07 along with a decrease in the average unemployment benefit from 0.25 to 0.23, and an increase in the average benefit from inactivity from 0.15 to 0.22. With these changes in the policy parameters we intend to simulate a situation where rule of law in the informal sector is stringently enforced, whereas attractiveness of inactivity is increased relative to unemployment. Since the relative increase in the attractiveness of inactivity is higher than the relative decrease in the attractiveness of unemployment, as showed in Figure 7.8, inactivity increases over time more rapidly than unemployment. With this result, we complement the finding of Boeri and Garibaldi (2002) who claim 'that a more aggressive approach against informal sector may ultimately fail, and results only in a more depressed labour market' (p.29). As a consequence, in order to reduce informal employment, it is necessary to reduce unemployment which further implies application of complementary policy measures. However, which policy regime, according to our simulations, would result in improved labour market conditions will be subject of analysis in the next chapter.

In addition to the above finding, two other conclusions from the 'pessimistic' scenario can be drawn. First, any policy measure aiming to reduce unemployment via reduction in unemployment benefits generosity, in the absence of job creation in the formal sector will result either in an increase of inactivity or informal employment. Which of these two adjustment mechanisms prevails depends on the adopted policy measures that target non-participation and informal employment. An increase in inactivity would dominate if the government provides generous alternative benefits after the exhaustion of unemployment benefits, whereas employment in the informal sector would dominate in the case of a relaxed monitoring of compliance with the rule of law. In this context, our findings synthesise the separate hypotheses that reduced generosity of unemployment benefits may lead to high inactivity (Boeri, 1999) or alternatively, may push more workers to choose informal work (Bouev, 2001). Finally, under the assumptions of the 'pessimistic' scenario, any policy aiming to reduce non-participation via reduction in the generosity of the inactivity benefits, associated with absence of job creation in the formal sector will result to increase either unemployment or employment in the informal sector. This finding is directly

drawn from the previous two results and confirms the hypothesis about inappropriateness of reforms that do not account for substantial measures that would improve the climate for job creation in the formal sector.

The 'optimistic' scenario assumes improved employment prospects by a decrease in the adverse economic shock which leads to job losses. This scenario is more likely to correspond to the development of advanced transition country characterised by improved investment climate in the formal sector and limited presence of the alternative labour market adjustment mechanisms. Alternatively, the 'optimistic' scenario may be used for projections of possible positive trends in the labour markets of less developed transition countries in order to assess their potential implications on the sustainable rate of unemployment. The labour market evolution with respect to the 'optimistic' scenario is illustrated by the dynamic simulations in Figure 7.9.

Figure 7.9 Dynamic simulations under the 'optimistic' scenario



In Figure 7.9 similarly as in the case of the 'pessimistic' scenario, solid lines correspond to the original simulation with the base line values of parameters, whereas

dotted lines correspond to the policy regime consisting of the following values of parameters: $b_U = 0.25$; $b_I = 0.15$; $\nu = 0.04$; $\lambda = 0.07$. Therefore, the 'optimistic' scenario assumes reduced adverse economic shock from 0.05 to 0.04 alongside with increased monitoring in the informal sector from 0.03 to 0.07 and unchanged average values of the benefits for unemployed and inactive population (Table 7.1).

From Figure 7.9 we notice that the formal sector due to improved economic conditions absorbs a fraction of employment in the informal sector, which as expected shrinks more rapidly over time following the increased government monitoring in this sector. In addition, as employment in the formal sector takes off, after certain period of time unemployment and inactivity start to decrease. In contrast to the 'pessimistic' scenario, in this case reducing the level of average unemployment benefits relative to the level of average benefit from inactivity may appear as an effective policy instrument for decreasing the sustainable rate of unemployment. Namely, reductions in generosity of unemployment benefits can further compound the process of job creation in the formal sector via the established fiscal mechanism and decrease unemployment by creating disincentives for exploiting the advantages of passive labour market policies. According to the 'optimistic' scenario we also observe a gradual decrease in inactivity, which is consistent with our predictions of growing labour force participation due to the improved employment conditions in the formal sector. In sum, these findings imply that in designing labour market policy packages the government should bring together the effects of various complementary policy measures under alternative development scenarios.

7.5 Conclusion

In this chapter we have developed our formal approach to modelling the sustainable rate of unemployment in transition countries. For this purpose we have based our strategy on the critical assessment of the OST group of models and made comparisons with results from those models based on matching functions. We have also incorporated some of the adjustment mechanisms identified in the previous analyses as relevant for SEECs and particularly for Macedonia. With respect to this, we have accounted for the phenomena of non-participation and employment in the informal sector, but we have not included emigration. There are at least two reasons that can be used as arguments for omission of emigration from our model. First,

according to the previous findings, we have concluded that the role of emigration as labour market adjustment mechanism in Macedonia has weakened due to the increasingly restrictive policies in potential host countries.[39] Second, inclusion of any additional adjustment mechanism would have rendered the model extremely complex.

In the first part of this chapter we have developed a structural model of the sustainable rate of unemployment. The main purpose of this model has been to establish the basic relationships between the labour market adjustment mechanisms and passive labour market policies in order to enable comparative static analysis. We have calibrated the model according to our previous findings about the labour markets in transition countries, and particularly Macedonia, with an aim of replicating the characteristics of depressed transitional labour markets. Numerical simulations have been performed in order to determine the impact of the aforementioned adjustment mechanisms. In this context, the comparative static analysis has yielded four testable results. First, at high rates of unemployment the attractiveness of job creation in the informal sector increases relative to job creation in the formal sector. Second, market wages in both sectors tend to decrease as unemployment increases, with elasticity in the informal sector being higher than in the formal sector. Third, the likelihood of dropping out of the labour force increases with unemployment. Fourth, multiple equilibria outcomes are possible since different policy regimes can result in different labour market outcomes.

In the second part of this chapter, we have modelled labour market dynamics by using the flow approach to the labour market. The idea of the dynamic analysis was to enable the assessment of the labour market evolution through time in order to determine the appropriateness of alternative labour market policies. For this purpose, we have accounted for changes in each of the considered labour market states by modelling the most important labour market flows. The dynamic simulations under the 'pessimistic' scenario illustrate that partial reforms aiming to reduce unemployment[40] without fostering effective job creation in the formal sector will not generate the desired improvements of labour market functioning. In contrast, a possible 'optimistic' scenario which assumes increased job creation in the formal sector demonstrated that appropriately modified passive labour market policies and

[39] Despite the recent decrease in emigration flows, remittances still play a significant role in Macedonia (Chapter 6, section 6.4.3).
[40] Or alternatively, employment in the informal sector or non-participation.

increased monitoring in the informal sector may be effective instruments for reduction of the sustainable rate of unemployment. More detailed policy recommendations for the reform of passive labour market policies, as well as policies toward the role of the labour market adjustment mechanisms based on the findings in this analysis, will be addressed in the next chapter.

CHAPTER 8

CONCLUSIONS AND POLICY RECOMMENDATIONS FOR MACEDONIA

8.1 Introduction

Arriving at the end of our book, we briefly recapitulate the background of the research and restate the key research questions. At the outset of transition almost all transition countries faced a number of adverse economic shocks manifested in a decline in employment and sharp increase in their unemployment rates. As the transitional process further advanced, some of the transition countries have managed to defeat the problem of high unemployment by implementing successful structural reforms and attaining sufficiently high growth rates. In contrast, the labour markets in other groups of countries such as the CIS and SEECs have remained depressed, experiencing high and persistent unemployment even one and a half decades after the start of transition. This group of countries is characterised by low job creation in the formal sector and still underdeveloped institutions. In these circumstances, various labour market adjustment mechanisms have occurred, among which particularly important in the case of SEECs are employment in the informal sector, inactivity and emigration. A detailed examination of the nature and importance of these mechanisms has frequently been neglected in previous studies of transitional labour markets.

The above outline constitutes the framework within which we have undertaken our research *i.e.* exploring the determinants of the sustainable rate of unemployment with the purpose of clarifying some of the reasons for the unfavourable labour market outcomes in SEECs, particularly in Macedonia. In this

context, we have tackled a number of issues: why does the SEECs labour market continue to under-perform relative to those in advanced transition countries? What theoretical framework is applicable to the analyses of the labour markets in SEECs? What are the reasons for their high and sustained unemployment rates and the low rate of job creation in the formal sector? How do the labour market adjustment mechanisms contribute to alleviating the unemployment problem? What are the appropriate policy reforms that government should apply in response to this labour market failure?

Following our analysis in the previous chapters, in this chapter we directly address the above questions and provide policy recommendations aiming to improve the labour market performance in Macedonia. The chapter is structured as follows. In section 8.2 we summarise the main findings of our research and identify the value added in each chapter in terms of the contribution to knowledge. In section 8.3 we consider the policy implications of our findings and propose policy measures aimed at securing an improvement in labour market performance in SEECs and particularly in Macedonia. In this context, and given the focus of our analysis above, we pay attention to two main policy areas: first, the design of appropriate passive labour market policies and second policies to assist preferred forms of labour market adjustment. The discussion in section 8.4 outlines the limitations that constrained us from fully exploring the problems under consideration. Finally, section 8.5 is devoted to issues that, in our view, deserve to be the subject of further investigation.

8.2 The main findings

In this section we present the main findings from the previous chapters, where two aspects are worth emphasising. First, attention is paid to the contributions of each chapter in providing responses to the main research questions. Second, we address the value added to the existing literature in that chapter's analysis.

Chapter 1 was conceived as a general overview of labour market trends in transition countries with an accent on SEECs and particularly Macedonia. The process of transition represents an interesting laboratory characterised by tremendous variations in key variables which has had profound consequences for economic, political and social life. According to the identified employment trends, as well as the trends in real wages, Macedonian labour market adjustment has followed a different

pattern in two sub-periods of transition. In the first phase (from 1990 to 1995), labour market adjustment was conducted both through wage reductions and lay-offs of surplus labour in state-owned firms. However, during the second phase of transition (from 1996 to the present) labour market adjustment at national level has been conducted mainly through declining employment. Regarding the sectoral reallocation of labour that occurred during the first phase of transition, Macedonia adheres to the group of less developed transition countries characterised by significant increase in the share of agriculture in total output and only a minor increase in the share of services.

The impact of the prolonged transitional recession on the labour market has been manifested in a high and persistent unemployment rate. According to the composition of the unemployed population by various socio-economic characteristics (education, age, gender, occupation, duration of unemployment etc.) our empirical analysis revealed striking labour market segmentation. With respect to this, some segments of the labour force such as youths, less educated workers and some ethnic minority groups face a much higher probability of becoming and/or remaining unemployed than the rest of the labour force. Moreover, we identified that the incidence of long-term unemployment in Macedonia is extremely high compared to other transition countries, indicating a likelihood of increasing human capital depreciation. Nevertheless, in our view the exceptionally high and persistent unemployment rates in SEECs are fraught with measurement difficulties and accompanied by unique labour market adjustment mechanisms.

Taking into account the high and persistent unemployment, we concluded that passive labour market policies, through the unemployment benefit system and various other forms of entitlements, play an important role in providing compensation to the unemployed. To our knowledge, we are first to provide measures of the level of generosity of unemployment benefit system in Macedonia and identify the sources of disparities between LFS and registration figures of its unemployment. In addition to the LFS/registered unemployment ratio, we constructed two new measures for detecting the sources of differences between LFS and registered unemployment: the Gross Disparity Index (GDI) and Net Disparity Index (NDI). By using these indices we estimated the extent of the existing moral hazard problem among the employed in the informal sector and the inactive who are motivated to register as unemployed in order to take advantages of the unemployment benefit system. Despite a repeated

tightening of the generosity of unemployment compensation in Macedonia, the level of registered unemployment is still considerably higher than the LFS unemployment measure, which indicates that accompanying entitlements, such as health insurance or acquiring eligibility for social assistance, continue to provide some of the inactive and those in informal employment with significant incentives to register as unemployed.

In the second chapter we provided an overview of the orthodox theoretical approaches to building a model of the sustainable rate of unemployment. In our view, the value added in this chapter consists of a critical assessment of two approaches that stand out as possible strategies in exploring the labour market equilibria. In particular, we first examined the applicability of NAIRU hypothesis to the case of SEECs and second, we critically assessed the relevance of the optimal speed of transition theory to our exploration.

Having in mind that the NAIRU is a long-run concept which requires macroeconomic stability and well-established institutions, we rejected its applicability to the labour markets of SEECs. We provided a number of additional justifications for this rejection such as: the relatively short time span since the start of transition, incompleteness of labour market institutions, high incidence of inflationary shocks and high proportion of long-term unemployment. In addition, we identified the need to establish an alternative equilibrium concept that would be more suitable for labour market reality in the transition countries of the South-East European region.

The OST approach seeks to explain the determinants of the pace of transition from a centrally-planed to market economy. Although specifically conceived for the transitional context, we found out that OST models suffer from a number of shortcomings that need to be overcome in order to apply them in our analysis. First, they are limited to the analysis of the first phase of transition. As a consequence secondly, they assume that the reallocation of labour mostly occurs between a declining state sector and growing private sector. Third, OST models typically assume a constant labour force, which is not appropriate when there has been a significant contraction in the labour force during the first phase of transition. Fourth, OST models largely neglect the role of the alternative labour market adjustment mechanisms. Fifth, they rarely account for the heterogeneous structure of the labour force and any pronounced labour force segmentation in transition countries. Sixth, OST model do not deal with the possibility of unemployment hysteresis and finally,

they do not explicitly allow for multiple equilibria outcomes. Taking into account the peculiarities of the labour markets in SEECs, we attempted to fill the above mentioned gaps in the OST literature and considered the possibility of extending this theoretical concept by providing a consistent definition of the sustainable rate of unemployment in SEECs.

In order to define the sustainable rate of unemployment we considered the labour market issues that in our view are relevant for SEECs. Having in mind the burdensome fiscal implications of persistent unemployment, we paid particular attention to the sustainability of the passive labour market policies in providing income support for unemployed. In addition, we considered the capacity of the alternative labour market adjustment mechanisms such as employment in the informal sector, inactivity and emigration to absorb a part of unemployed population, as well as their budgetary impact. Therefore, at the heart of our definition of the sustainable rate of unemployment we placed the balance between the revenues collected from the payroll taxes together with social security contributions levied on the formally employed and expenditures on passive labour market policies, including the impact of existing labour market adjustment mechanisms.

Chapter 3 examined the labour market dynamics in transition countries with reference to Macedonia from two different perspectives: job flows and worker flows between the basic labour market states. In our analysis we identified a need to examine in detail labour market dynamics as the market adjusted to the large transitional shocks. The value added in this chapter can be viewed in the formal development of a stock-flow model adapted to labour market reality in transition countries with regard to a differentiation between employment in the private and employment in the state sector. Using a stock-flow model we identified that a low outflow rate from unemployment is one of the main reasons for the stagnant unemployment pool and, when accompanied by high flows into inactivity indicates the presence of an increased number of 'discouraged workers'.

Additionally, we shed light on job turnover and demonstrated that successful achievement of transition, *inter alia* meant establishing a balance between the processes of job creation and job destruction, eventually accompanied by an improved sectoral allocation of labour. Our empirical analysis of job turnover in transition countries showed different dynamics in the two sub-periods of transition with job destruction dominating during the first period, and the subsequent recovery

of job creation in the mature phase of transition. With respect to the timing of this recovery, we distinguished between the advanced transition countries such as CEECs and laggards such as CIS and SEECs.

Our analysis of Macedonian labour market dynamics reflected the characteristics of a 'lagging reformer' with negative net employment change during the whole first decade of transition and a rather sclerotic labour mobility. Despite the low flow into employment, the absorptive capacity of the private sector in the mature phase of transition was estimated to be considerably higher than other types of ownership. Moreover, the estimated probability of becoming unemployed is unevenly distributed across different age groups of workers, with particularly younger groups of workers being affected by a higher probability of becoming unemployed and remaining inactive. These findings indicated the vulnerability of the youth labour market segment thus, confirming our previous evidence of a segmented labour market.

In Chapter 4 we assessed employment in the informal sector as a labour market adjustment mechanism during transition. With respect to the measurement methodology we proposed an alternative approach to the measurement of employment in the informal sector using the LFS. Having in mind both the strengths and shortcomings of this approach compared to other approaches, it was suggested it could provide additional information about the composition of employment in the informal sector. By taking into account the precarious characteristics of the informal jobs and the low level of human capital accumulation among workers engaged in informal employment, we revealed that the informal sector in transition countries has predominantly subsistence characteristics.

According to our empirical analysis, we identified the level of corruption, competition policy, unemployment rate and corporate tax rate as significant determinants of the size of informal sector in transition countries. Even though, for the whole set of transition countries, we found a negative relationship between the size of the informal sector and unemployment, for the subset of SEECs we found evidence of a strong positive correlation between these two variables. In addition, we also identified that the burden arising from social security contributions, which plays a significant role in this group of countries which may be considered as an additional determinant of the size of informal sector.

The empirical evidence of the size and structure of Macedonian labour force engaged in the informal sector was presented using the LFS. According to this analysis, workers in this sector are predominantly prime-age males who work in rural areas, and have a lower level of educational attainment. Among the informally employed only a small proportion are employers or entrepreneurs in unregistered enterprises, whereas the rest represent various types of employees who do not have stable contracts. This composition can be partly attributed to the low level of the corporate tax rate in Macedonia relative to other transition countries, whilst the rate of social security contributions paid by employers is among the highest in the region. Consequently, we argued that such a combination might create strong incentives for enterprises to operate formally whilst employing workers on an informal basis.

Chapter 5 comprised an analysis of the size and structure of the non-participant working-age population in transition countries and particularly in Macedonia. The aim of this chapter was to determine the extent to which non-participation, as a labour market adjustment mechanism, absorbed a part of the unemployed after the initial transitional shock. We noticed that the extent of non-participation in transition countries appears to strongly depend on the proportion of long-term unemployment, which can be linked to the already observed phenomenon of 'discouraged workers'. The fiscal effects of increased non-participation were assessed by calculating the system dependency ratios for selected transition countries, which indicated a rising budgetary burden during the first phase of transition.

Our empirical analysis of the non-participant population in Macedonia showed that women, the youngest and the oldest groups of workers, as well as less educated workers face the highest probability of being non-participants. Taking into account that the same labour market segments are affected by highest probability of becoming unemployed, this finding strengthened our previous findings on labour market segmentation. As possible causes for increased non-participation in Macedonia, we pointed out the availability of early retirement and disability pensions for the oldest group of workers, as well as the extension of participation in post-compulsory education among the youngest group of workers.

We also assessed the absorptive capacity of non-participation as an adjustment mechanism in Macedonia and concluded that, except for the period 1999-2002, the adjustment was roughly balanced between unemployment and non-participation. Moreover, according to the analysis of the relationship between unemployment and

inactivity we stressed the possibilities of an overlap between these two categories as well as between inactivity and other forms of labour market adjustments. Despite the recent stabilisation in the number of non-participants, we showed that the labour market adjustment pattern in Macedonia has far-reaching negative implications for the budgetary balance manifested in the increased system dependency ratio.

The phenomenon of emigration, as alternative labour market adjustment mechanism in transition countries was critically examined in Chapter 6. In this context, we identified differences in emigration tendencies between less-developed and advanced transition countries with short-term emigration being more common in the former group and long-term and permanent emigration in the latter group of countries. Our analysis of the causes of emigration suggested that high rates of unemployment and low living standard are the main economic "push" factors that initiate the emigration movements from less-developed transition countries. On the other hand, the consequences of emigration are ambiguous, since the positive effects from the remittances and increased level of skills amongst those returning are offset by the negative effects from the loss of human capital.

Our empirical analysis of emigration in Macedonia, utilising data from the census of population in 2002, revealed that ethnic Albanians, males, young and prime age workers are particularly inclined towards emigration. In addition, by using econometric analysis we demonstrated that network effects have a significant positive, and the distance to destination country a significant negative, impact on the intensity of migration flows. However, generally we found that emigration flows have been falling possibly due to the increased restrictions in the labour importing countries that represent the traditional destinations for Macedonian emigration. Despite the recent slowdown in the emigration flows from Macedonia, the remittances from the permanent emigrants still play a significant role as a safety net in alleviating poverty or alternatively in fostering domestic investment.

Chapter 7 provided a synthesis of the previous chapters and introduced a formal model of the sustainable rate of unemployment in SEECs. Initially, we developed a structural model of the sustainable rate of unemployment by extending the assumptions of the standard OST models and introducing additional key aspects of the labour markets in the SEECs. Particular attention in building the model was paid to employment in the informal sector and inactivity as labour market adjustment mechanisms and their impact on the budgetary balance, whereas from the policy point

of view, we included instruments of passive labour market policy. The calibration of the model was carried out in accordance with the previous analyses of the labour market in Macedonia. Numerical simulations with various levels of the parameters had the purpose of determining the direction and magnitude of impact of labour market adjustment mechanisms, as well as the impact of policy instruments, on the sustainable rate of unemployment.

The developed structural model provided several testable results from the comparative static point of view used as basis in developing policy recommendations. First, job creation in both formal and informal sectors is strongly influenced by the level of unemployment. Particularly, a high rate of unemployment, such as that observed in Macedonia, is associated with a rising trend of job creation in the informal sector and a falling trend in the formal sector. Second, market wages in both sectors are decreasing functions of unemployment, with wages in the informal sector on average being more elastic than in the formal sector. Third, the attractiveness of labour force participation decreases as unemployment increases. Finally, depending on the adopted policies we identified the possibility of multiple equilibria.

In addition a dynamic analysis was also undertaken with the purpose of investigating labour market behaviour over time. The evolution of the number of workers in each of the basic labour market states was simulated with alternative scenarios regarding possible policy regimes. The aim of the numerical simulations was to identify the policy regime that would minimise the sustainable rate of unemployment in the long-run. According to the 'pessimistic' scenario, we found that more restrictive unemployment benefits accompanied by an absence of job creation in the formal sector result either in increased inactivity or greater employment in the informal sector. In the 'optimistic' scenario, simulating the labour market evolution under the assumption of improved job creation in the formal sector, we demonstrated that suitably designed passive labour market policies could play a significant role in the reduction of the sustainable rate of unemployment.

In summary, from the above analyses we concluded that multiple equilibria in the labour market are possible and indeed are likely to have occurred in transition economies. The so-called 'good equilibrium', common in successful transition economies is associated with low unemployment rates and limited need for other labour market adjustment mechanisms. In contrast, most of the SEECs labour markets have entered into a sub-optimal equilibrium characterised by high unemployment and

a low demand for labour in the formal sector. Moreover, in this case the alternative labour market adjustment mechanisms have had a significant impact in alleviating the social consequences of the high and persistent unemployment. Therefore, a further research challenge in the book was to find out appropriate policy measures that could assist the Macedonian economy moving from its 'bad' to a 'good' equilibrium. These policy recommendations have to address the relevant issues studied in the previous chapters such as reforms of the passive labour market policies and policies toward each of the alternative labour market adjustment mechanisms. Having in mind the strategic development goals, we also pay attention to policy implications from the point of view of prospective EU membership. These policy recommendations will be developed in the next section.

8.3 Policy implications for Macedonia

From the previous discussion we have seen that Macedonian macroeconomic performance is characterised by various unfavourable trends that obstruct job creation in the formal part of the economy. The unstable political environment, underdeveloped capital market, low average skill level of the labour force, high level of corruption etc. represent only a small part of the total list of weaknesses leading to the poor performance of the Macedonian labour market. Generally, Macedonia's 'bad' equilibrium results from a failure of sufficient job creation in the formal sector coupled with policies that tolerate, if not encourage, alternative labour market adjustment mechanisms. Significant movement towards a 'good' equilibrium is likely to be achieved only by undertaking radical restructuring measures that foster formal job generation and thereby place less emphasis on the role of the less conventional forms of labour market adjustment.

Having in mind that the problem of unemployment is one of the most persistent problems of Macedonian transition, our policy recommendations will mainly focus on measures which target reductions in the unemployment rate and improvement in labour market conditions. For this purpose we will use the results of our empirical analyses as well as the results from the numerical simulations of our model of sustainable rate of unemployment. Particular attention will be paid to the appropriate design of passive labour market policies and policies toward the labour market adjustment mechanisms. In this context, we highlight the need to design a

complementary package of reforms that will simultaneously tackle these issues. Our policy recommendations are not formulated in the form of an 'operational plan', but rather as general directions that should inform the future actions of the policy makers.

8.3.1 Recommendations for passive labour market policies

Our empirical assessment of passive labour market policies in Macedonia emphasises the contrast between the relatively small fraction of registered unemployed who are benefit recipients and the vast majority of those who register in order to benefit from other entitlements such as health insurance or acquiring eligibility for social assistance. The relatively small number of benefit recipients is consistent with our findings in Chapter 1 of widespread long-term unemployment and the limited duration of unemployment benefits in Macedonia. According to our analysis, the incentives to register as unemployed originate in the relatively generous eligibility for other entitlements rather than in the generosity of the unemployment benefits, a situation common to other transition countries (Mickiewicz and Bell, 2000). Furthermore, the easy access to these entitlements renders some other adjustment mechanisms, such as employment in the informal sector or temporary/seasonal emigration, as more attractive alternatives for those not employed in the formal sector (Kupets, 2005). This is particularly important in the case of insufficient job creation in the formal sector which corresponds to our simulated 'pessimistic' scenario in Chapter 7. As a consequence, when undertaking measures to restrict unemployment benefits' generosity the government has to account for at least two important issues. First, the incentives created by other entitlements tied to the registration status of unemployed and second, possible overlaps between registered unemployment and other labour market adjustment mechanisms. In this context, we recommend more stringent monitoring of the *de facto* status of the registered unemployed and their search effort, accompanied by sanctions for non-compliance ranging from partial to total withdrawal of benefits. Moreover, we propose the provision of health insurance and social assistance to non-searchers through alternative channels, instead of its current attachment to registration status.

Some authors claim that in transition countries it is difficult to make a precise differentiation between unemployment benefits and other forms of non-employment subsidies and emphasise their common role in creating a 'floor' in wage-setting

(Boeri, 2000; Boeri and Terrell, 2002). The case of Macedonia has shown that unemployment benefits can, although seemingly provided to only a small proportion of the unemployed population, after their termination often be substituted with other 'bridging schemes' to retirement such as social assistance, disability pensions or early retirement. Moreover, we should recall that according to the existing legal framework, those unemployed who have at least 15 years paid unemployment insurance and are less than 5 years from obtaining an old person's pension continue to receive unemployment benefits until hired or retirement (Chapter 1). Therefore despite their limited duration unemployment benefits, taken together with other non-employment benefit, provide a variety of outside options that may significantly discourage workers from taking up jobs (especially in the formal sector) and also have a strong impact on the government's budget. With respect to this, we recommend that the administration of unemployment benefits be separated from other income support schemes, limiting the possibility of substitution between different types of benefits.

Having in mind that since the outset of transition the demand side of the Macedonian labour market has not substantially improved in terms of job creation in the formal sector, we should not exaggerate the likely effects from applying more restrictive passive labour market policies. In other words, the government will fail to improve labour market performance, if reduced spending on non-employment benefits is not translated into lower payroll taxes and an improved climate for investment and job creation. Less generous passive labour market policies that are not accompanied by sufficient additional job creation in the formal sector are unlikely to cause a decrease in the unemployment rate. This is consistent with our 'pessimistic' scenario in the labour market evolution modelled in section 7.4.2 as well as with the detected trade-off between unemployment benefits' generosity and the size of the informal sector (Boeri, 2000).

In conclusion, the long duration of unemployment in Macedonia associated with human capital depreciation has exerted negative effects on the supply side of the labour market by reducing the employability of a large section of the labour force. Therefore, in the spirit of our 'optimistic' scenario we recommend that restrictions on the generosity of passive labour market policies should be complemented by policies aiming to intensify job creation in the formal sector and active labour market policies that improve the attractiveness and effectiveness of job search. Otherwise, the

restriction of the unemployment benefits would probably largely result in a transfer of welfare beneficiaries from unemployment to other benefits with little or no positive effects on the balance between revenues from payroll taxes and overall expenditures on welfare.

8.3.2 Policies toward alternative labour market adjustments

Alongside reforms of passive labour market policy, we recommend policies targeted at the alternative labour market adjustment mechanisms. Starting with employment in the informal sector, various strategies can be applied in order to shape its size, with enforcement of the rule of law being the most frequently cited instrument (Roland, 2000). In our view, improved enforcement should include stricter inspections on the application of the existing labour code, as well as inflicting effective fines on enterprises found to have hired workers on an informal basis. According to our analysis in Chapter 4, we have identified that enforcement of the rule of law in Macedonia is at a low level compared to that in the more advanced transition countries, creating a strong stimulus for operating in this segment of the economy. However, in considering more stringent enforcement of the rule of law we should take into account two important issues. First, additional enforcement measures should target those sectors of the informal economy which directly compete with firms in the formal sector to minimise the initial employment contraction. Second, in order to avoid the so-called 'shadow puzzle', suppression of the informal sector has to be accompanied by the creation of incentives to operate in the formal part of the economy. Among the latter group of measures, the emphasis should be given to alleviation of the burden engendered from the high rates of social security contributions paid by employers, as well as applying tax incentives on a selective basis following the successful experience of some developed western economies (Falcetti et al., 2003). Otherwise, an increase in the enforcement of the rule of law may actually increase unemployment, since informal employment and unemployment represent two different sides of the same coin (Boeri and Garibaldi, 2002).

It is worth mentioning that the relative size of the formal sector in a society is strongly influenced by the quality of the institutional environment (Roland, 2001). Taking into account their undeveloped institutions and extremely high level of corruption by western standards, SEECs are unlikely to achieve large and rapid

reductions in their informal sectors. Moreover, there are number of indications of excessive employment in the public administration, which together with the above-mentioned weaknesses negatively affects the credibility of the governments (Boeri, 2000; Mickiewicz and Bell, 2000). Therefore in order to strengthen confidence in the rule of law, governments in SEECs should undertake institutional transformations aiming to create the necessary favourable preconditions for operating in the formal sector. Initial steps in this direction have been already taken in Macedonia, such as simplifying the procedure for registering a firm by introducing a One-Stop Shop System that on average has reduced the registration duration from 48 to only 6 days. [41] Additionally in December 2006 the corporate tax rate was reduced from 15 to 12 percent, alongside the reduction in personal income tax rates from 15, 18 and 24 to only 12 percent. However, further efforts are needed to ensure effective implementation and enforcement of the new rules.

Some authors advocate measures that provide a balance between the security required by employees and flexibility needed by the employers (Cazes, 2002; Cazes and Nesporova, 2003; European Commission, 2006). Taking into account the pronounced segmentation in SEECs labour markets, we suggest labour market reforms be concentrated on segments that are at the highest risk of unemployment, and particularly long-term unemployment. In our view, formal job creation will be enhanced by offering a greater variety of contractual and working hour arrangements that would render formal contracts more affordable to employers and would particularly improve the employment prospects of those in the deprived segments of the labour market. As a consequence, as job creation in the formal sector eventually increases, we expect that labour market segmentation will diminish. In addition, measures that promote greater flexibility in the labour market might be useful as a complementary tool in combating the growth of the informal sector, since as we identified in our previous analyses, those in the deprived labour market segments are the most susceptible to informal employment arrangements.

The above reforms should be viewed with respect to the future prospects of entering the EU. In this context, some authors claim that EU conditionality may operate as discipline device and help create an economic environment with a higher level of compliance with the law (Boeri, 2000; Roland, 2001; Roland and Verdier,

[41] The law on One-Stop Shop System came into force in October 2005.

2003). Having in mind that from the very beginning of the transition process, CEECs governments have committed themselves to the EU accession, we can partly explain why the enforcement of the rule of law in these countries has stood at relatively high levels when compared with the CIS and SEECs. Nowadays, several SEECs have started the long journey towards EU accession, which gives us optimism to believe that over time the role of informal sector and other non-traditional labour market adjustment mechanisms will diminish. With respect to this, we expect that in the foreseeable future tax morality and compliance with the existing labour code will gradually increase, whereas the level of corruption will manifest a steadily declining trend.

Policies aiming to encourage the transfers of the unemployed into inactivity were extensively applied during the first phase of transition as a way of reducing the level of unemployment (Chapter 5). In this context, early retirement schemes and disability pensions were particularly exploited strategies. Despite their relatively low level compared to unemployment benefits, these entitlements are usually for a longer duration (sometimes open-ended) and can impose a higher budgetary burden. As a consequence, dependency ratios have enormously increased in almost all transition countries including Macedonia. In other words, the above policies just transfer the budgetary burden from unemployment into the sphere of inactivity by creating additional expenditures. Thus, these policies have detrimental impact on the budgetary balance and we do not recommend them as tools for alleviating the unemployment problem. Instead, we advise that the existing social assistance programme be offered jointly with active measures to households with no formally employed members in order to equip them with required work skills and improve their employment prospects in the formal segment of the labour market.

Since migratory flows currently largely depend on immigration restrictions adopted by labour importing countries, there is little ability to influence emigration through Macedonian polices. Moreover, in Chapter 6 we have seen that the intensity of the permanent emigration from Macedonia has recently slowed down, but temporary/seasonal emigration is still likely to play an important role. In spite of this, permanent emigration might appear as a valuable source of finance either through providing a safety net or funding investment in businesses. In our view, the level of emigration and the use of remittances can be indirectly influenced by creation of a

more favourable domestic investment climate that will attract more return/retention of migrants, and more remittances that will be productively used for investment.

8.4 Limitations of our research

Our research on the determinants of the sustainable rate of unemployment has been constrained by various limitations arising either from the lack of reliable data, or inability to gain full access to existing datasets. Since it is not possible to make an exhaustive list of all possible limitations, at this point we describe only those that stand out as the most important. In addition, we examine strategies aiming to overcome these limitations, which at the same time would allow further extensions of the research.

There are two main sources of unemployment data in Macedonia, *i.e.* the LFS carried out by the Statistical Office and counts of registered unemployment from the ESA. The data from the ESA have not been used in this research because of its identified shortcomings (Chapter 1, section 1.7). We argued that these unemployment figures are inflated as a result of the large number of those employed in the informal sector or the inactive who register as unemployed in order to exploit the possibility of receiving unemployment benefits and other entitlements. Since, the ESA is the only source of longitudinal data for the unemployed, we are deprived of analysing unemployment duration which would provide additional information about the nature of unemployment in Macedonia.

As stressed in Chapter 1, most of the data used in this research are drawn from the Macedonian LFS, which was introduced in 1996 and provides data on a yearly basis. Presently, we can only construct series for labour market variables over a time span of one decade which is insufficient for applying time series analysis. Only since 2004 has the LFS been regularly carried out on quarterly basis that in the foreseeable future will allow more complex analyses of labour market trends. Thus, given inability to access individual level data we are not able to apply this type of analysis and constrained to use descriptive statistics and graphical presentations of the labour market trends.

The LFS has been designed according to the ILO standards and covers a representative sample of the population of working age (Chapter 1). On the other hand, the LFS data is characterised by questionable reliability, which arises from the

self-reporting character of the survey (World Bank, 2003). In depressed labour markets like the Macedonian one, there is a high probability that those who are informally employed declare themselves as unemployed in order to avoid possible sanctions. Thus even the LFS, which in our view is the most appropriate source of labour market data in Macedonia, suffers from a certain level of imprecision. However, according to our analyses, we can make some adjustments for overlaps between different labour market categories in order to provide a more accurate picture of the Macedonian labour market. Such an attempt to adjust the LFS data is presented in Appendix 4.1. Another possible approach to improving data accuracy is to use other surveys carried out by the Statistical Office such as the Survey of Household Revenues and Consumption. The results from this survey can be used to track the source of a household's revenues, which indirectly helps in detecting the employment status of the household's members. As already stressed, according to the estimation by the World Bank (2003) based on a similar approach, the actual unemployment rate in Macedonia could be ten percentage points less than the official unemployment rate, taking into account that a considerable part of the self-declared unemployed are either employed in the informal sector or inactive.

The Macedonian Statistical Office does not release individual level data to researchers and therefore cross-sectional and panel analyses are not possible. However, some of the LFS data required for our analyses were obtained following a special request to the Macedonian Statistical Office. Data obtained through requests included that on workers flows (Chapter 3) and the number of employed in the informal sector (Chapter 4). In the former case the data were used to construct a transition matrix, while in the latter case they have been used in assessing the proportion of labour force engaged in the informal sector. Since these data are neither regularly published nor free, they cover only one time period because of the limited financial funds available for this research. However, as mentioned in the previous section, we have not been able to access data that would allow investigation of the final use of remittances (Chapter 6). In sum, our analysis has been severely constrained by data availability and led to the adoption of a research methodology largely based upon modelling and simulation.

Finally, we have to state the limitations that have occurred as a result of the nature of the modelling undertaken in this research. According to the principle of parsimony, some of the assumptions were chosen to simplify reality, but at the same

time these affected the modelling outcomes. First, we have assumed that benefits for the unemployed and inactive are entirely financed by payroll taxes levied on the employed in the formal sector. In fact, these benefits are currently only partly covered by payroll taxes in Macedonia, with part being covered by the general budget revenues. Second, we have not explicitly included emigration as separate labour market adjustment mechanism in our model in order to keep it manageable. This can be partly justified by the decline in its relative importance due to a recent slowdown of emigration flows (Chapter 6). Third, the calibration of the model is also subject to a number of criticisms. Despite our choice of parameter values being justified by the results of our previous analyses, at times they have been chosen arbitrarily according to our subjective beliefs. Fourth, the simulations of the model have been carried out on the *ceteris paribus* principle which assumes change in the value of only one parameter, while other parameters remain unchanged. This approach imposes limitations since changes in reality often occur simultaneously and are frequently interdependent. Finally, when carrying out dynamic simulations we have assumed an unchanging institutional environment, which in the case of transition countries is unlikely to hold, at least over a long period of time.

8.5 Avenues for further research

Above we have summarised the main findings of the research, outlined its principal limitations and derived policy recommendations. By answering the key research questions we have paved the way for undertaking targeted labour market reforms with the ultimate purpose of improving Macedonian labour market performance. However, in this research as in any other scientific endeavour, a number of issues have not been fully explored. These issues represent a challenge for our own further investigation or remain to be uncovered by other researchers.

Even though unemployment is a central theme in our research, there are a number of aspects of unemployment that deserve more detailed analysis. First, as mentioned in Chapter 1 and confirmed later in Chapter 3, labour market segmentation is one of the striking features of the labour markets in SEECs. We have found that the deprived labour market segments are those who encounter high unemployment rates but also face low exit rates from unemployment. The reasons for this segmentation, as well as applicable policies for its reduction, are an interesting area for further

research. Second, the problem of youth unemployment is particularly relevant, since a thriving youth segment can become one of the pillars for future growth. Third, given the predominance of long-term unemployment in SEECs, analysis of the determinants of unemployment duration deserves particular attention. The dilemma as to whether determinants of long-term unemployment differ from those of short-term unemployment remains an important research question. As mentioned above, we were constrained from performing such analysis by the lack of reliable data. Alternatively, longitudinal data from the ESA can be used with a note of caution: they are biased as a result of the impact of passive labour market policies on the incentives for the unemployed to register.

With respect to the labour market adjustment mechanisms several issues remain open for further research. For instance, in our analysis we have assumed that the informal sector, given its subsistence characteristics, has a lower average productivity than the formal sector. However, the structure of activities performed in the informal sector together with their levels of productivity can only be fully examined by designing and implementing a special survey. Furthermore, we have assumed a possible overlap between inactivity and informal sector that needs to be formally assessed. The occupational and geographical mobility of the labour force is another possible adjustment mechanism that can be explored, though researchers have found that these factors are of little importance with respect to labour market adjustment in the more advanced transition countries (Svejnar, 2002a; Mickiewicz, 2005; Bornhorst and Commander, 2006). The limited capacity of these adjustment mechanisms is explained by skill mismatches in the case of the occupational mobility and imperfections in the housing market and transportation infrastructure in the case of geographical mobility. However, the role of occupational and geographical mobility remains to be investigated in the context of less developed transition countries such as Macedonia. Finally, considering the role of remittances, we also recommend a survey that would disentangle its impact on labour market outcomes, an issue which remained unanswered above.

From the policy point of view, we have put the accent on research of passive labour market policies, without tackling the active labour market policies and the role of employment protection legislation (EPL). Further research should examine the complementarities between passive and active labour market policies as well as the size of any trade-off between the generosity of unemployment benefits and strictness

of EPL in designing an optimal policy mix. The importance of active labour market policies for SEECs can be viewed from two different perspectives. First, the role of the active labour market policies receives greater weight when skill obsolescence is higher *i.e.* when the long-term unemployment prevails over the short-term unemployment. Second, the SEECs aspiration in the foreseeable future to become a part of the EU requires adoption of the Lisbon agenda, which imposes ambitious objectives in terms of attaining international labour market competitiveness. With this in mind, we can argue that investment in human capital becomes increasingly valuable and implies a need for reform of active labour market policies and, more particularly, the overall education system.

Finally, in an interdisciplinary context, the problem of unemployment can be further analysed in conjunction with other social phenomena such as poverty, income inequality and social exclusion. An initial assessment of poverty in Macedonia has already been undertaken, but without a full analysis of the link between the poverty and unemployment (World Bank, 2005b). The complexity in the relationships between these phenomena is even greater if we take into account the possibility of reverse causation, where causality may exist simultaneously in both directions. Last but not least, the design of the welfare system should be re-examined in the light of its redistributive effects and impact on the level of inequality and poverty. In other words, reforms of passive labour market policies have to be evaluated not only from efficiency, but also from an equity point of view.

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Appendix 2.1 Summary of the reviewed literature on explanations for rising NAIRU

Authors	Shocks	Institutions
Snowdon et al. (1994)	Reduced aggregate demand	Reduced flexibility of the labour market
Phelps (1995)	Rising labour force	
Layard (1996)	Reduced employability	
Stiglitz (1997)	Demographics of the labour force Wage aspiration effect Competitiveness in production market Hysteresis effect	
Siebert (1997)		Labour market rigidities
Nickell (1998)	Increased product market competition Increased real interest rate	Unemployment benefit system Union coverage Union and employers coordination in bargaining Labour market rigidities Taxes on labour Skill mismatch
Gordon (1998)	Changes in real food and energy prices Changes in real import prices Increased deflation of real computer prices Reduced inflation in real medical care prices Reduced inflation due to measurement improvements	
Blanchard and Wolfers (2000)	Oil shocks Decreased aggregate demand Total factor productivity growth slowdown Evolution of interest rates	Unemployment insurance system Employment protection legislation Taxes on labour
Saint-Paul (2004)		Rigid labour market institutions
Nickell et al. (2005)	Labour demand shock Total factor productivity shock Real import price shock Money supply shock Increased real interest rate	Employment protection Benefit replacement ratio and benefit duration Union density Union and employers coordination in bargaining Total employment tax rate

Appendix 4.1 Selected key economic and labour market indicators for transition countries

Country	Informal sector 2003[a]	CPI 2003[b]	Regulation 2003[c]	Fiscal Burden 2003[c]	Income tax rate 2004[c]	Corporate tax rate 2004[c]	Unempl. rate 2003[d]	Rigidity of employm. 2004[e]	Social sec. contrib. 2005[e]	Enterprise restructur. 2003[f]	Compet. policy 2003[f]	Overall inf. reform 2003[f]	Population below 2$ a day %[g]
Albania	35.3	2.5	4.0	3.8	25	25	15.2	48	30.7	2.00	1.67	2.00	11.8
Armenia	49.1	3.0	4.0	1.9	20	20	10.1	49	18.8	2.33	2.00	2.33	49.0
Azerbaijan	61.3	1.8	4.0	3.5	50	34	1.4	38	27.0	2.33	2.00	2.00	9.1
Belarus	50.4	4.2	5.0	3.4	30	30	3.1	27	39.1	1.00	2.00	1.33	2.0
Bosnia-Herzegovina	36.7	3.3	5.0	2.9	5	30	42	38	42.0	2.00	1.00	2.33	19.5
Bulgaria	38.3	3.9	4.0	3.1	29	19.5	13.7	44	32.2	2.67	2.33	2.67	16.2
Croatia	35.5	3.7	4.0	2.6	45	20	14.3	57	17.2	2.67	2.33	2.67	2.0
Czech Republic	20.1	3.9	3.0	3.0	32	28	7.8	28	37.0	3.33	3.00	3.33	2.0
Estonia	40.1	5.5	2.0	1.8	26	0	10.0	55	33.0	3.33	2.67	3.33	5.2
Georgia	68.0	1.8	4.0	2.0	20	20	11.5	43	31.0	2.00	2.00	2.33	15.7
Hungary	26.2	4.8	3.0	3.0	38	16	5.7	37	33.5	3.33	3.00	3.67	2.0
Kazakhstan	45.2	2.4	4.0	3.5	20	30	8.8	23	22.0	2.00	2.00	2.33	24.9
Kyrgyzstan	41.2	2.1	4.0	3.1	20	30	9.0	38	26.5	2.00	2.00	1.33	24.7
Latvia	41.3	3.8	3.0	2.5	25	15	10.6	63	22.4	3.00	2.67	3.00	8.3
Lithuania	32.6	4.7	3.0	2.1	33	15	12.4	44	28.0	3.00	3.00	2.67	6.9
Macedonia	36.3	2.3	4.0	2.3	18	15	36.7	50	32.5	2.33	2.00	2.00	4.0
Moldova	49.4	2.4	4.0	2.8	22	20	7.9	68	30.0	1.67	2.00	2.00	64.1
Poland	28.9	3.6	3.0	2.8	40	19	19.6	37	25.8	3.33	3.00	3.33	2.0
Romania	37.4	2.8	4.0	3.1	40	25	7.0	63	34.0	2.00	2.33	3.00	14.0
Russian Federation	48.7	2.7	4.0	2.4	13	24	8.0	30	35.8	2.33	2.33	2.33	7.5
Slovak Republic	20.2	3.7	3.0	2.6	19	19	17.4	39	35.2	3.33	3.00	3.00	2.9
Slovenia	29.4	5.9	2.0	3.6	50	25	6.6	64	16.6	3.00	2.67	3.00	2.0
Ukraine	54.7	2.3	4.0	3.9	13	25	9.1	58	36.4	2.00	2.33	2.00	45.7

Sources: [a] *Schneider, 2005;* [b] *Transparency International;* [c] *Heritage Foundation;* [d] *ILO, LABORSTA database;* [e] *World Bank;* [f] *EBRD, Transition report 2005;* [g] *World Bank, World Development Indicators, 2005*

Appendix 4.2

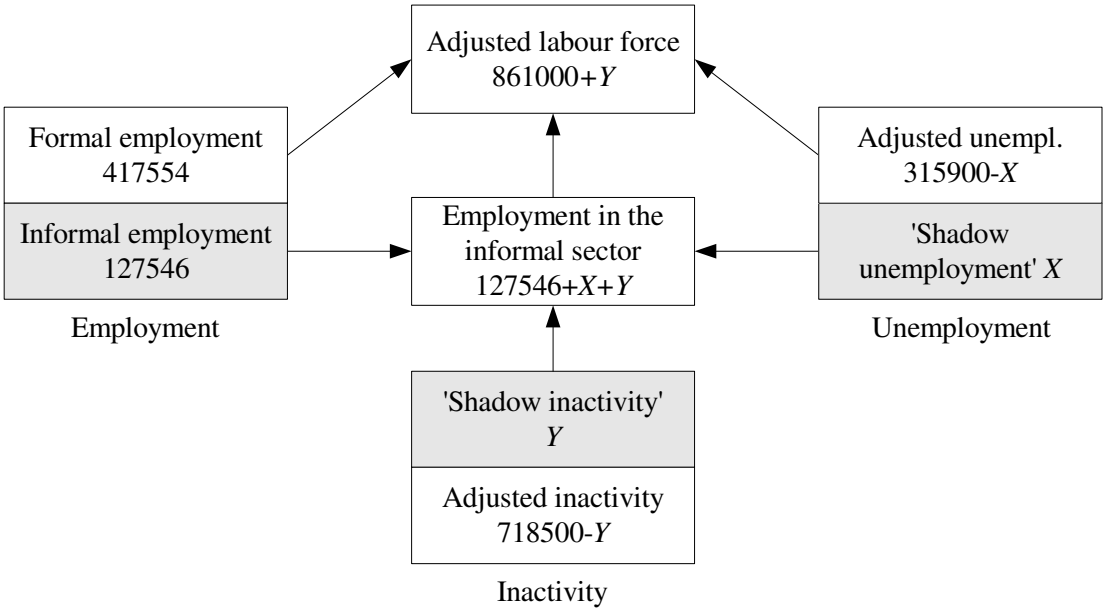
White's heteroscedasticity consistent variance-covariance matrix and standard errors for model (4.1)

```
Estimated Variance-Covariance Matrix of parameters
Adjusted White's Heteroscedasticity-Consistent Estimates
********************************************************************************
Based on OLS regression of X1 on: C X6 X2 X11 X7
23 observations used for estimation from 1 to 23
********************************************************************************
                      C             X6             X2            X11           X7
 C                241.5945       -2.5679       -12.9578       -48.9683      -1.4574
 X6                -2.5679         .0437          .1839          .36491       .0096
 X2               -12.9578         .1839         2.6784         -.75587       .0545
 X11              -48.9683         .3649         -.7559        16.4636        .3305
 X7                -1.4574         .0096          .0545          .33057       .0171
********************************************************************************
```

Variable	Value	Original Std. error	Adjusted Std. error
Intercept	117.7019	14.8678	15.5433
Tax	-0.6391	0.2642	0.2090
CPI	-4.6084	1.7183	1.6366
Comp	-16.4273	4.3712	4.0575
U	-0.7886	0.1899	0.1308

Appendix 4.3

Adjustment of unemployment rate for employment in the informal sector (Estimation based on LFS, 2003)



Total LFS employment (including formal and informal): 417554+127546=545100

Official LFS unemployment rate $= \frac{315900}{861000} = 36{,}7\%$

Total employment in the informal sector as share of working age population $= \frac{127546 + X + Y}{1579500}$ … (1)

X – 'Shadow unemployment'

Y – 'Shadow inactivity'

Adjusted unemployment = $315900 - X$

Adjusted labour force = $861000 + Y$

Unemployment rate adjusted for employment in the informal sector $= \frac{Adjusted\ unemployment}{Adjusted\ labour\ force} = \frac{315900 - X}{861000 + Y}$ … (2)

Appendix 4.4

Structure of the informally employed in Macedonia-main activity

	Non-regular employees	Contributing family workers	Own-account workers	Employers in unregistered enterprises	Casual, temporary or seasonal workers	Total
Total	28.6%	23.8%	21.3%	14.9%	11.3%	100.0%
Gender						
Men	18.5%	10.2%	18.0%	12.8%	6.3%	65.8%
Women	10.1%	13.6%	3.4%	2.1%	5.0%	34.2%
Urban/rural						
Urban	18.6%	2.5%	6.7%	3.5%	7.2%	38.6%
Rural	10.1%	21.3%	14.6%	11.3%	4.1%	61.4%
Educational attainment						
Without education	2.4%	4.7%	4.8%	4.7%	0.2%	16.8%
Primary education	7.9%	12.2%	9.5%	5.4%	2.7%	37.8%
Secondary education	16.1%	6.3%	6.2%	4.1%	4.8%	37.6%
Higher education	2.2%	0.5%	0.8%	0.6%	3.6%	7.8%
Age						
15-24	5.7%	4.4%	0.6%	0.3%	1.9%	13.0%
25-34	9.8%	6.8%	3.3%	2.1%	5.6%	27.6%
35-44	8.2%	4.5%	5.9%	4.8%	1.9%	25.4%
45-54	4.0%	4.0%	6.0%	3.5%	1.4%	18.9%
55-64	0.7%	2.7%	3.8%	2.9%	0.4%	10.5%
65 +	0.1%	1.3%	1.7%	1.3%	0.1%	4.6%

Source: Macedonian Statistical Office, LFS 2003

Appendix 4.5

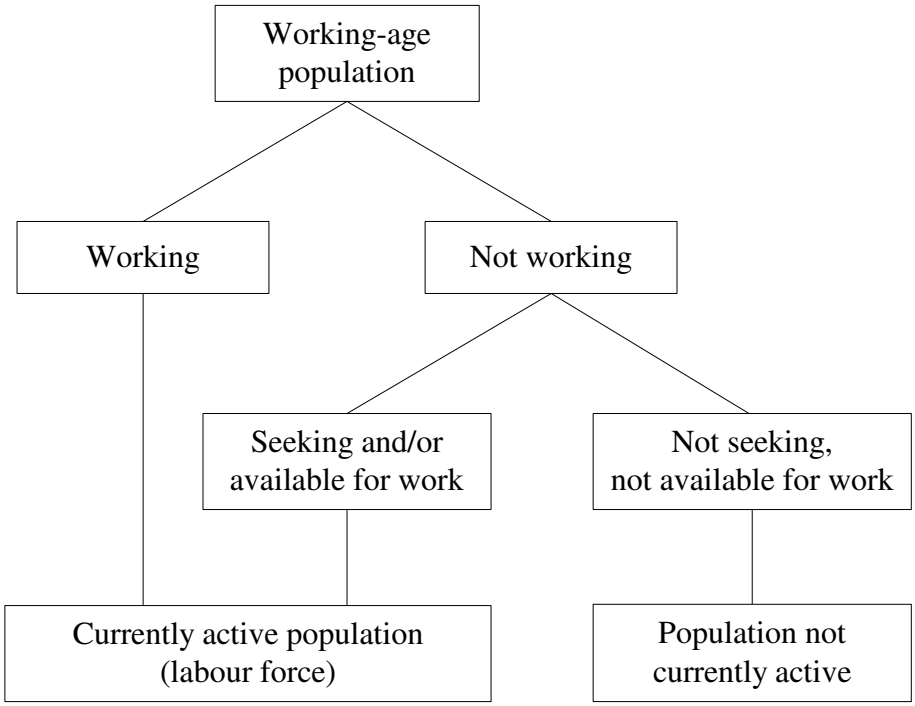
Structure of the informally employed in Macedonia-second job

	Contributing family workers	Own-account workers	Non-regular employees	Total
Total	65.2%	30.1%	4.7%	100.0%
Gender				
Men	38.2%	26.9%	2.5%	67.6%
Women	27.0%	3.2%	2.2%	32.4%
Urban/rural				
Urban	20.1%	15.8%	2.9%	38.8%
Rural	45.1%	14.3%	1.8%	61.2%
Educational attainment				
Without education	5.4%	1.7%	0.7%	7.7%
Primary education	19.8%	6.3%	0.9%	27.0%
Secondary education	32.4%	16.3%	1.1%	49.8%
Higher education	7.6%	5.8%	2.1%	15.5%
Age				
15-24	6.5%	1.4%	0.0%	7.8%
25-34	16.3%	3.4%	0.4%	20.1%
35-44	22.6%	12.0%	3.0%	37.6%
45-54	13.3%	9.9%	1.1%	24.3%
55-64	5.6%	3.1%	0.0%	8.7%
65 +	1.0%	0.3%	0.3%	1.6%

Source: Macedonian Statistical Office, LFS 2003

Appendix 5.1

Labour force classification scheme according to the ILO standards



Source: ILO (1990)

Appendix 6.1

Emigrants from Macedonia according to the country of destination and duration of stay

Country	Total	1-3 months	4-6 months	7-9 months	10-12 months
Europe	21412	4482	9129	4773	3028
Austria	1298	386	564	236	112
Belgium	200	43	80	51	26
Germany	4426	759	2043	993	631
Denmark	401	88	116	97	100
Italy	5874	1267	2420	1253	934
Norway	130	17	40	47	26
United Kingdom	280	40	91	61	88
Russia	85	20	25	24	16
Slovenia	972	293	374	185	120
Serbia and Montenegro	303	115	79	66	43
France	150	27	52	40	31
Croatia	361	118	143	73	27
Czech Republic	144	29	45	31	39
Switzerland	5937	1031	2784	1452	670
Sweden	202	54	50	55	43
Other	649	195	223	109	122
America	1031	165	327	284	255
Canada	203	49	59	34	61
United States	825	116	268	247	194
Other	3	-	-	3	-
Australia and Oceania	364	86	92	72	114
Asia	41	11	12	9	9
Africa	23	2	8	3	10
Unknown countries	124	18	43	29	34
Total	22995	4764	9611	5170	3450

Source: Census of Population, Households and Dwellings in the Republic of Macedonia, 2002, Book IV 'Macedonian Citizens Absent Abroad, Foreigners Present in Republic of Macedonia'

Appendix 6.2

Emigrants from Macedonia according to the country of destination and ethnic affiliation

Country	Total	Macedonians	Albanians	Turks	Romas	Vlachs	Serbs	Bosniacs
Europe	21412	5655	13630	1514	152	22	97	132
Austria	1298	385	821	44	15	-	6	15
Belgium	200	18	173	1	6	-	-	-
Germany	4426	800	3312	134	83	4	14	49
Denmark	401	4	391	1	1	-	-	-
Italy	5874	1846	3006	912	16	5	3	17
Norway	130	5	121	1	-	-	3	-
United Kingdom	280	254	23	-	-	1	-	-
Russia	85	77	2	-	-	-	4	-
Slovenia	972	615	148	154	1	1	8	3
Serbia-Montenegro	303	140	114	7	-	2	34	1
France	150	77	66	-	-	-	1	6
Croatia	361	102	237	13	-	-	-	-
Czech Republic	144	113	18	8	-	-	4	-
Switzerland	5937	749	4922	180	24	5	10	23
Sweden	202	77	115	6	1	-	2	-
Other	649	393	161	53	5	4	8	18
America	1031	534	438	42	2	2	9	2
Canada	203	194	5	1	1	-	1	-
United States	825	338	432	41	1	2	8	2
Other	3	2	1	-	-	-	-	-
Australia-Oceania	364	317	25	9	1	4	5	2
Asia	41	29	8	-	-	-	-	2
Africa	23	20	2	-	-	-	1	-
Unknown countries	124	56	52	9	1	-	5	1
Total	22995	6611	14155	1574	156	28	117	139

Source: Census of Population, Households and Dwellings in the Republic of Macedonia, 2002, Book IV 'Macedonian Citizens Absent Abroad, Foreigners Present in Republic of Macedonia'

Appendix 6.3

Data used for econometric analysis of short-term emigration from Macedonia

Country	Emigrated in 2002 [a]	Stock of emigrants [b]	GNI per capita (2002) [c]	Unemployment rate (2002) [d]	Distance [e]
Austria	3.113	3.556	4.378	0.602	2.903
Belgium	2.301	3.322	4.361	0.875	3.223
Germany	3.646	4.633	4.357	0.940	3.114
Denmark	2.603	3.505	4.481	0.672	3.215
Italy	3.769	4.364	4.281	0.954	2.875
Norway	2.114	2.778	4.588	0.591	3.322
UK	2.447	2.699	4.407	0.708	3.283
Russia	1.929	1.778	3.328	0.949	3.279
Slovenia	2.988	3.431	4.016	0.771	2.857
Serbia and Montenegro	2.481	4.674	3.146	1.140	2.505
France	2.176	3.301	4.347	0.954	3.217
Croatia	2.558	3.000	3.657	1.170	2.785
Czech Republic	2.158	2.699	3.739	0.863	3.013
Switzerland	3.774	4.732	4.558	0.462	3.097
Sweden	2.305	3.699	4.414	0.602	3.283
Canada	2.307	4.491	4.350	0.886	3.771
USA	2.916	4.641	4.549	0.763	3.785
Australia	2.561	4.914	4.291	0.799	4.041

Sources: [a] *Census of the population, households and dwellings in Macedonia, 2002;*
[b] *Estimated from previous censuses and other administrative source;*
[c] *World Bank;*
[d] *International Labour Organisation (LABORSTA);*
[e] *Distance between Skopje and capital city of destination country (in kilometres);*

Results from econometric analysis (log values of the variables)

```
*** Linear Model ***

Call: lm(formula=LogV1~LogV2+LogV3+LogV4+LogV5, data=Logs,
na.action=na.omit)

Residuals:
     Min       1Q  Median      3Q   Max
 -0.5975 -0.2827 0.07772 0.1845 0.527

Coefficients:
             Value Std. Error t value Pr(>|t|)
(Intercept)  2.0787  1.8048     1.1518  0.2702
      LogV2  0.3936  0.1146     3.4351  0.0044
      LogV3  0.5000  0.3645     1.3715  0.1934
      LogV4 -0.2169  0.7273    -0.2982  0.7703
      LogV5 -0.8645  0.2923    -2.9577  0.0111

Residual standard error: 0.3937 on 13 degrees of freedom
Multiple R-Squared: 0.6413
F-statistic: 5.811 on 4 and 13 degrees of freedom, the p-value is 0.006
```

Appendix 7.1

Solution of the system of market wages and job creation functions from *Mathcad*

Given

$$wf = bu + cf \cdot (r + \nu) + Jf \cdot \frac{F}{U} \cdot cf + Ji \cdot \frac{I}{U} \cdot ci$$

$$wi = (1 - \delta) \cdot bu + ci \cdot (r + \nu + \lambda) + Jf \cdot \frac{F}{U} \cdot cf + Ji \cdot \frac{I}{U} \cdot ci$$

$$Jf = af \cdot \left[yf \cdot \left(1 - \frac{U \cdot bu + O \cdot bi}{F} \right) - wf \right]$$

$$Ji = ai \cdot (yi - wi)$$

$$\text{Minerr}(Jf, Ji, wf, wi) \rightarrow \begin{bmatrix} -af \cdot \dfrac{(-yf \cdot F \cdot U - yf \cdot F \cdot I \cdot ci \cdot ai + yf \cdot U^2 \cdot bu + yf \cdot U \cdot bu \cdot I \cdot ci \cdot ai + yf \cdot O \cdot bi \cdot U + yf \cdot O \cdot bi \cdot I \cdot ci \cdot ai + F \cdot cf \cdot U \cdot \nu + F \cdot cf \cdot U \cdot r + F \cdot U}{[(U + I \cdot ci \cdot ai +} \\ ai \cdot \dfrac{(yi \cdot U + yi \cdot cf \cdot af \cdot F - U \cdot bu - cf \cdot af \cdot yf \cdot F + cf \cdot af \cdot yf \cdot U \cdot bu + cf \cdot af \cdot yf \cdot O \cdot bi + U \cdot bu \cdot \delta - ci \cdot U \cdot r - ci \cdot U \cdot \nu \cdot}{(U + I \cdot ci \cdot ai +} \\ -\dfrac{(-cf \cdot U \cdot \nu - cf \cdot U \cdot r - U \cdot bu - bu \cdot \delta \cdot I \cdot ci \cdot ai + ci^2 \cdot r \cdot I \cdot ai + ci^2 \cdot \nu \cdot I \cdot ai + ci^2 \cdot \lambda \cdot I \cdot ai + cf \cdot af \cdot}{(U + I \cdot ci \cdot ai + c} \\ -\dfrac{(-U \cdot bu - I \cdot ci \cdot ai \cdot yi - cf \cdot af \cdot yf \cdot F + cf \cdot af \cdot yf \cdot U \cdot bu + cf \cdot af \cdot yf \cdot O \cdot bi + U \cdot bu \cdot \delta - ci \cdot U \cdot r - ci \cdot U \cdot \nu - ci \cdot}{(U + I \cdot ci \cdot ai + c} \end{bmatrix}$$

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$$\frac{U \cdot bu + F \cdot bu \cdot \delta \cdot I \cdot ci \cdot ai - F \cdot ci^2 \cdot r \cdot I \cdot ai - F \cdot ci^2 \cdot \nu \cdot I \cdot ai - F \cdot ci^2 \cdot \lambda \cdot I \cdot ai + F \cdot I \cdot ci \cdot ai \cdot cf \cdot r + F \cdot I \cdot ci \cdot ai \cdot cf \cdot \nu + F \cdot I \cdot ci \cdot ai \cdot yi)}{+ cf \cdot af \cdot F) \cdot F]}$$

$$\frac{\nu - ci \cdot U \cdot \lambda + cf \cdot af \cdot F \cdot bu \cdot \delta - cf \cdot af \cdot F \cdot ci \cdot r - cf \cdot af \cdot F \cdot ci \cdot \nu - cf \cdot af \cdot F \cdot ci \cdot \lambda + cf^2 \cdot af \cdot F \cdot r + cf^2 \cdot af \cdot F \cdot \nu)}{+ cf \cdot af \cdot F)}$$

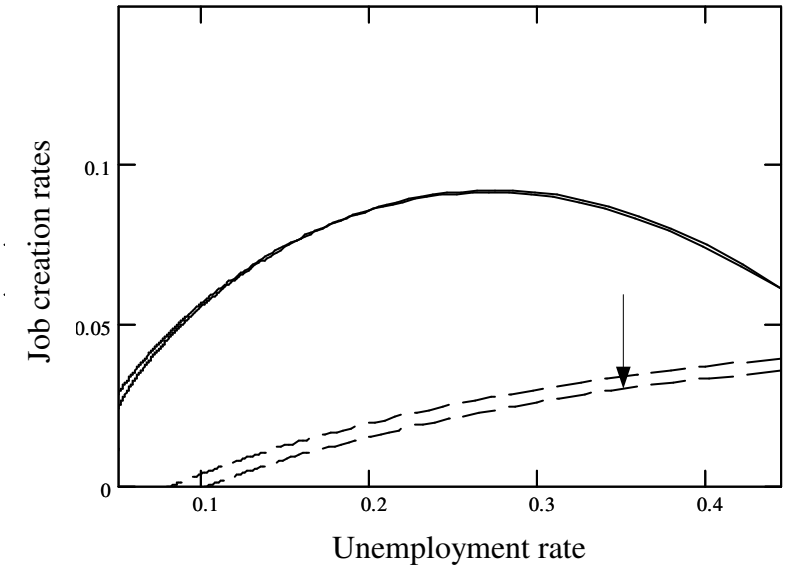
$$\frac{\cdot yf \cdot U \cdot bu - I \cdot ci \cdot ai \cdot cf \cdot r - I \cdot ci \cdot ai \cdot cf \cdot \nu - cf \cdot af \cdot yf \cdot F + cf \cdot af \cdot yf \cdot O \cdot bi - I \cdot ci \cdot ai \cdot yi)}{cf \cdot af \cdot F)}$$

$$\frac{\cdot U \cdot \lambda + cf \cdot af \cdot F \cdot bu \cdot \delta - cf \cdot af \cdot F \cdot ci \cdot r - cf \cdot af \cdot F \cdot ci \cdot \nu - cf \cdot af \cdot F \cdot ci \cdot \lambda + cf^2 \cdot af \cdot F \cdot r + cf^2 \cdot af \cdot F \cdot \nu)}{\cdot cf \cdot af \cdot F)}$$

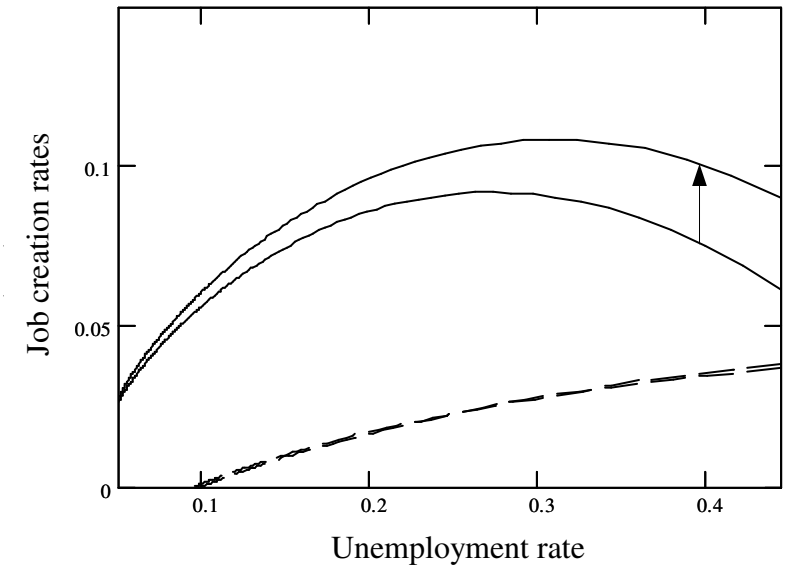
Appendix 7.2

Simulations of the job creation rates with different values of parameters

Simulation of an increase in the parameter λ from 0 to 0.05*



Simulation of a reduction in the parameter b_U from 0.25 to 0.2*



* The arrow indicates the direction of shift

Appendix 7.3

Estimated wage and participation elasticities with respect to the unemployment rate

A. Estimated wage elasticity in the formal sector

```
Call: lm(formula = log(wf) ~ log(U), data = Elasticity, na.action = na.omit)
Residuals:
      Min       1Q   Median       3Q      Max
 -0.03112 -0.0066 0.001564 0.008263 0.01221

Coefficients:
                 Value Std. Error   t value  Pr(>|t|)
  (Intercept)   -0.4885    0.0045  -108.5502    0.0000
       log(U)   -0.3785    0.0051   -73.9801    0.0000

Residual standard error: 0.009665 on 99 degrees of freedom
Multiple R-Squared: 0.9822
F-statistic: 5473 on 1 and 99 degrees of freedom, the p-value is 0
```

B. Estimated wage elasticity in the informal sector

```
Call: lm(formula = log(wi) ~ log(U), data = Elasticity, na.action = na.omit)
Residuals:
      Min        1Q   Median      3Q     Max
 -0.04105 -0.008441 0.001383 0.01077 0.01545

Coefficients:
                 Value Std. Error   t value  Pr(>|t|)
  (Intercept)   -0.5979    0.0057  -104.3747    0.0000
       log(U)   -0.4390    0.0065   -67.4160    0.0000

Residual standard error: 0.0123 on 99 degrees of freedom
Multiple R-Squared: 0.9787
F-statistic: 4545 on 1 and 99 degrees of freedom, the p-value is 0
```

C. Estimated participation elasticity

```
Call: lm(formula = epsilon ~ log(U), data = Particip, na.action = na.omit)
Residuals:
      Min       1Q   Median      3Q    Max
 -0.09756 -0.01606 0.002827 0.02108 0.0304

Coefficients:
                Value Std. Error  t value Pr(>|t|)
  (Intercept)  -0.9246   0.0117   -79.1380   0.0000
       log(U)  -0.6493   0.0133   -48.8910   0.0000

Residual standard error: 0.02509 on 99 degrees of freedom
Multiple R-Squared: 0.9602
F-statistic: 2390 on 1 and 99 degrees of freedom, the p-value is 0
```

Appendix 7.4

A dynamic model of the labour market with three labour market states

We consider three possible labour market states: employment (*E*), unemployment (*U*) and out-of-labour force (*O*). The system of differential equations that describes the changes in each of these labour market states will have the following form:

$$\frac{dE(t)}{dt} = p_{21}U(t) + p_{31}O(t) - p_{12}E(t) - p_{13}E(t)$$

$$\frac{dU(t)}{dt} = p_{12}E(t) + p_{32}O(t) - p_{21}U(t) - p_{23}U(t)$$

$$\frac{dO(t)}{dt} = p_{13}E(t) + p_{23}U(t) - p_{31}O(t) - p_{32}O(t)$$

where $E(t)$, $U(t)$ and $O(t)$ represent the number of workers in employment, unemployment and out-of-labour force respectively in time period *t*, whereas p_{ij} are estimated transition probabilities between the labour market states given in the following transition matrix:

$$T = \begin{array}{c} \\ E \\ U \\ O \end{array} \begin{array}{c} \begin{array}{ccc} E & U & O \end{array} \\ \begin{bmatrix} p_{11} & p_{12} & p_{13} \\ p_{21} & p_{22} & p_{23} \\ p_{31} & p_{32} & p_{33} \end{bmatrix} \end{array}$$

In order to simulate the changes over time in each of the labour market states, the above differential equations can be transformed into difference equations as follows:

$$E_{t+1} = E_t + p_{21}U_t + p_{31}O_t - p_{12}E_t - p_{13}E_t$$

$$U_{t+1} = U_t + p_{12}E_t + p_{32}O_t - p_{21}U_t - p_{23}U_t$$

$$O_{t+1} = O_t + p_{13}E_t + p_{23}U_t - p_{31}O_t - p_{32}O_t$$

Finally, by choosing the initial values for each of the labour market states and using estimated transition probabilities, we can simulate the evolution of the labour market for a given number of periods.

Appendix 7.5

Simulation of the labour market dynamics in Macedonia as a Markov stochastic process

In the case where transition probabilities between labour market states are constant over time we assume that they obey a Markov stochastic process or Markov chain. A Markov chain can be absorbing or ergodic, depending on whether there exists an absorbing state in which the system can be locked after certain number of transitions. In an ergodic Markov chain all states communicate, the state space is finite and rates of transitions between the states are constant over time.

Let us denote with s_t the vector of the probability distribution among the states for a given period *t*. For an ergodic Markov process there exists a so-called stationary distribution s_∞, which designates a stable distribution that does not depend on the initial vector. The stationary distribution can be conceived as an equilibrium state of the system. The calculation of stationary distribution is straightforward from the condition that for very large t, s_t and s_{t+1} are the same: $s_\infty = s_\infty T$.

Let us apply this condition to the transition matrix of labour market flows in Macedonia between 2002 and 2003 as described in Chapter 3 (Table 3.4):

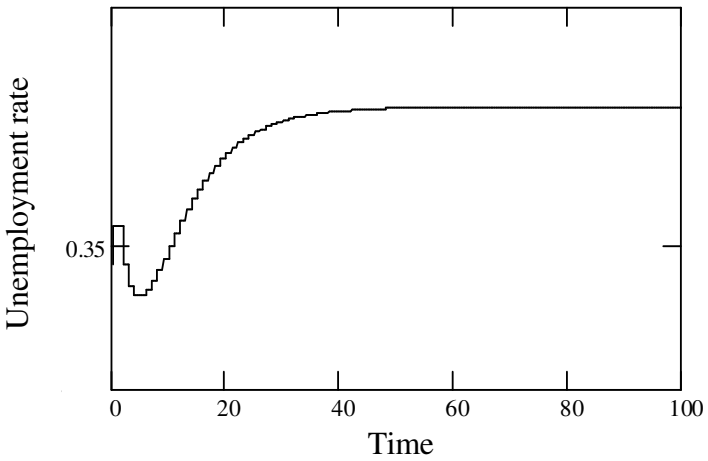
$$T = \begin{array}{c} \\ E \\ U \\ O \end{array} \begin{bmatrix} 0.8897 & 0.0580 & 0.0523 \\ 0.0976 & 0.7342 & 0.1682 \\ 0.0186 & 0.0382 & 0.9432 \end{bmatrix}$$

Assuming that transition matrix is constant over time and, having in mind the necessary condition for calculating the stationary distribution, we obtain the following

stationary distribution:

$$s_\infty = \begin{array}{cccc} & E & U & O \\ & [0.231 & 0.141 & 0.629] \end{array}$$

$$U^* = \frac{0.141}{0.141 + 0.231} = 0.379$$



Appendix 7.6

Dynamic simulation of the labour market evolution in *Mathcad*

$af := 0.3 \quad cf := 1 \quad yf := 1 \quad r := 0.05 \quad \delta := 0.35$

$ai := 0.1 \quad ci := 0.8 \quad yi := 0.7$

$$\text{simul}(n, bu, bi, \nu, \lambda) :=$$
$F \leftarrow 0.3$
$I \leftarrow 0.2$
$U \leftarrow 0.3$
$O \leftarrow 0.2$
for $i \in 0..n$
$JCf \leftarrow -af \cdot \frac{(-yf \cdot F \cdot I \cdot ci \cdot ai - yf \cdot F \cdot U + yf \cdot U \cdot bu \cdot I \cdot ci \cdot ai + yf \cdot U^2 \cdot bu + yf \cdot O \cdot bi \cdot I \cdot ci \cdot ai + yf \cdot O \cdot bi \cdot U + F \cdot cf \cdot U \cdot \nu + F}{}$
$JCi \leftarrow ai \cdot \frac{(yi \cdot cf \cdot af \cdot F + yi \cdot U - ci \cdot U \cdot \lambda + U \cdot bu \cdot \delta - ci \cdot U \cdot r - ci \cdot U \cdot \nu + cf \cdot af \cdot yf \cdot U \cdot bu + cf \cdot af \cdot yf \cdot O \cdot bi - U \cdot bu - cf \cdot a}{(I \cdot ci \cdot ai + cf \cdot}$
$\varepsilon \leftarrow bu - bi + JCf \cdot \frac{F}{U} \cdot cf + JCi \cdot \frac{I}{U} \cdot ci$
$x1 \leftarrow \int_0^s 1 \, dx$
$x2 \leftarrow \int_s^1 1 \, dx$
$F \leftarrow F - \nu \cdot F + JCf \cdot F$
$I \leftarrow I - (\lambda + \nu) \cdot I + JCi \cdot I$
$U \leftarrow U + x1 \cdot [(\nu - JCf) \cdot F + (\lambda + \nu - JCi) \cdot I]$
$O \leftarrow O + x2 \cdot [(\nu - JCf) \cdot F + (\lambda + \nu - JCi) \cdot I]$
U

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$$\frac{\cdot cf \cdot U \cdot r - F \cdot ci^2 \cdot \lambda \cdot I \cdot ai + F \cdot bu \cdot \delta \cdot I \cdot ci \cdot ai - F \cdot ci^2 \cdot r \cdot I \cdot ai - F \cdot ci^2 \cdot \nu \cdot I \cdot ai + F \cdot U \cdot bu + F \cdot I \cdot ci \cdot ai \cdot yi + F \cdot I \cdot ci \cdot ai \cdot cf \cdot r + F \cdot I \cdot ci \cdot ai \cdot cf \cdot \nu)}{[(I \cdot ci \cdot ai + cf \cdot af \cdot F + U) \cdot F]}$$

$$\frac{af \cdot yf \cdot F + cf^2 \cdot af \cdot F \cdot r + cf^2 \cdot af \cdot F \cdot \nu - cf \cdot af \cdot F \cdot ci \cdot \nu + cf \cdot af \cdot F \cdot bu \cdot \delta - cf \cdot af \cdot F \cdot ci \cdot r - cf \cdot af \cdot F \cdot ci \cdot \lambda)}{af \cdot F + U)}$$