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**Exploring the linkages
between investment and
employment in Moldova:**

A time-series analysis

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Preface

The primary goal of the ILO is to contribute, with member States, to achieve full and productive employment and decent work for all, including women and young people, a goal embedded in the ILO Declaration 2008 on *Social Justice for a Fair Globalization*,[1] and which has now been widely adopted by the international community.

In order to support member States and the social partners to reach the goal, the ILO pursues a Decent Work Agenda which comprises four interrelated areas: Respect for fundamental worker's rights and international labour standards, employment promotion, social protection and social dialogue. Explanations of this integrated approach and related challenges are contained in a number of key documents: in those explaining and elaborating the concept of decent work,[2] in the Employment Policy Convention, 1964 (No. 122), and in the Global Employment Agenda.

The Global Employment Agenda was developed by the ILO through tripartite consensus of its Governing Body's Employment and Social Policy Committee. Since its adoption in 2003 it has been further articulated and made more operational and today it constitutes the basic framework through which the ILO pursues the objective of placing employment at the centre of economic and social policies.[3]

The Employment Sector is fully engaged in the implementation of the Global Employment Agenda, and is doing so through a large range of technical support and capacity building activities, advisory services and policy research. As part of its research and publications programme, the Employment Sector promotes knowledge-generation around key policy issues and topics conforming to the core elements of the Global Employment Agenda and the Decent Work Agenda. The Sector's publications consist of books, monographs, working papers, employment reports and policy briefs.[4]

The *Employment Working Papers* series is designed to disseminate the main findings of research initiatives undertaken by the various departments and programmes of the Sector. The working papers are intended to encourage exchange of ideas and to stimulate debate. The views expressed are the responsibility of the author(s) and do not necessarily represent those of the ILO.

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[1] See http://www.ilo.org/public/english/bureau/dgo/download/dg_announce_en.pdf

[2] See the successive Reports of the Director-General to the International Labour Conference: *Decent work* (1999); *Reducing the decent work deficit: A global challenge* (2001); *Working out of poverty* (2003).

[3] See http://www.ilo.org/gea. And in particular: *Implementing the Global Employment Agenda: Employment strategies in support of decent work, "Vision" document*, ILO, 2006.

[4] See http://www.ilo.org/employment.

Foreword

The study by Stefania Villa of Birkbeck College, University of London, aims to contribute toward improving employment policy in Moldova. The main objective of the research is to generate a solid empirical understanding of some of the existing constraints to employment growth in the Moldovan context, using a macro-econometric approach. The research was carried out by the ILO Subregional Office for Central and Eastern Europe, Budapest and by the Employment Policy Department of the ILO.

After a prolonged period of economic decline during the 1990s, the Moldovan economy has been characterized by consumption-led growth, largely based on remittances. Due to the presence of excess labour in agriculture and under-utilized capacity in manufacturing, employment declined from 2000, with rural areas suffering the most. The lack of jobs and the upsurge in fertility that took place in the late 1980s brought Moldovan workers to look for income opportunities in Russia and the European Union. This exacerbated the dependency of the Moldovan economy on remittances and agricultural exports, as well as on imported energy from Russia and Ukraine. Thus far the economy has not succeeded in attaining endogenous development conducive to employment growth; and the reduction in remittances due to the global financial and economic crisis are likely to deepen poverty in rural areas. In this regard, economic policies combining investment with a sustainable and feasible development strategy are a precondition for effective employment policies. The paper highlights the macroeconomic aspects that link growth and investment to labour market trends.

We would like to express our appreciation to Makiko Matsumoto of the ILO Employment Policy Department, who provided overall technical supervision for the study, and to Andrea Salvini of the ILO Sub-regional Office for Central and Eastern Europe in Budapest, who provided technical support. The paper also benefited from comments by other ILO colleagues: Alana Albee, In-Kon Kim and Per Ronnas. This study would have not been possible without the support of the ILO Project "Strengthening the governance of the labour market through improved design, monitoring and evaluation of gender-sensitive employment policies" funded by the Government of the Czech Republic, and of the ILO/Korea partnership on investment, growth and employment.

The findings of the study were presented and discussed at a capacity building workshop on 5 June 2009 in Chisinau, where members of the Working Group on Employment Policy, representatives from other national and academic institutions, as well as from other international organizations actively participated. We are grateful for the insights and comments received during the workshop. We would like this paper to be seen as an example of macroeconomic methodological application, as well as a foundation for more employment-focused policy actions.

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Introduction

The Republic of Moldova (Moldova, henceforth) has experienced a remarkable change over the last 15 years. The period of economic transition started in 1991, when Moldova became an independent state, following the disintegration of the Soviet Union. Moldova's independence was soon recognized abroad and the country has since become a member of number of multilateral organizations such as the UN, the IMF, the European Bank for Reconstruction and Development (EBRD).

For the countries of the former Soviet Union the transition from a centralized economy to a market economy incurred grave shocks, due to the introduction of a programme of privatization, price liberalization and a legal framework for a market economy. Moldova experienced a particularly severe and prolonged decline in economic performance and living standards until 1999, as Ronnas and Orlova (2000) emphasized.

Moscow's centralized economic policies integrated Moldova deeply into the Soviet economy. The economy was very open to transactions with the other Soviet republics, but trade with countries outside the Soviet Union was small: the equivalent to some 6 per cent of GDP in 1991. With the Soviet economy Moldova specialized in agricultural production. The Moldovan Government prepared its first programme for economic reform and restructuring in 1991. While Moldova was considered a leading reformer among the Commonwealth of Independent States (CIS), the structural reform efforts have been protracted, following a "stop and go" [5] pattern. The achievement of sustained economic growth implies a competitive national economy, where the technology changes rapidly and there is a continuous accumulation of high skilled human capital with academic and vocational education, lifelong learning and programmes to promote entrepreneurial development. The promotion of a liberal and transparent business climate and a balanced geographic distribution of economic and technical infrastructure also play an important role.

As the Growth Report (2008) underlined, a complex set of growth strategies is needed to sustain growth over a long period; four sets of policies have been identified:

(1) policies which promote accumulation, including both private and public investment;

(2) policies which promote innovation and imitation: more innovation generally feeds into higher productivity; [6]

(3) policies which promote an efficient allocation of capital and labour;

(4) policies which promote macroeconomic and political stability.

This list is far from being exhaustive, and it is not a sufficient condition for inclusive growth. On the empirical side, the growth regressions approach has identified a very high number of variables correlated with growth (Sala-I-Martin, Doppelhofer and Miller, 2004).

A key economic objective of the Moldovan authorities consists of improving the functioning of the labour market. The economic recovery that started in 2000, founded on a weak and structurally dysfunctional base after a decade of decline, could be characterized as "jobless" growth.

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[5] World Bank, 2005.

[6] See Criscuolo, Haskel and Slaughter, 2005, among many others.

An integrated analysis of investment, growth and employment can shed some lights on employment-generating growth strategies. It can highlight the past structural constraints to employment growth and calls for an urgent need to undertake proactive economic and investment policies to promote employment. The present analysis develops and illustrates the conceptual and empirical knowledge on growth, employment and investment in Moldova, emphasizing the empirical relationships between these variables and discussing some policy implications, with particular regard to employment growth. This study, given the availability of data, focuses on the following macroeconomic variables which can affect employment: GDP, investment, consumption, exports, imports and FDI.

In the first section we present the main macroeconomic indicators of Moldova, from a time-series perspective and in comparison with other transition economies. In the second section we illustrate the theoretical framework of the study; in particular, we illustrate the determinants of economic growth and the determinants of employment growth. The third section offers a detailed descriptive statistics, with particular regards to the indicators of Moldovan labour market. The fourth section is the core of the study; it discusses econometric specifications and presents the estimation results performed with the VAR approach. Some autoregressive distributed lag (ARDL) specifications are also presented. The final section discusses the potential effects of the financial crisis on the Moldovan economy; it also offers some concluding remarks and policy implications.

Section 1 – The Moldovan economy

This section summarizes some important characteristics of the macroeconomic time series data for the Moldovan economy since 1991. [7]

1.1. Economic growth

Examination of the path of GDP from 1990 to 2006 shows two distinct phases: the first one is characterized by a downward spiral till 1999, and the second, from 2000 onwards, exhibits an upward trend. This pattern is also confirmed by the growth rate of real GDP in figure 2.

Figure 1.   GDP in constant price (local currency)**, 1990–2006**
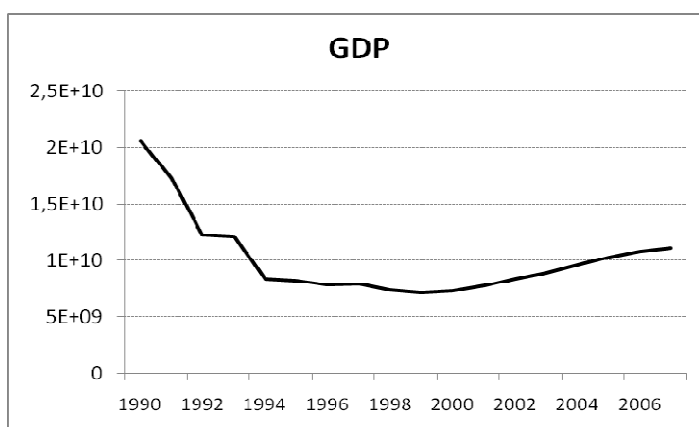
Source: WB.

Figure 2.   Real GDP growth rate

Moldova experienced a severe economic collapse following the break-up of the Soviet Union. The collapse was caused by many factors, such as the breakdown of the Soviet-era trade and supply links, severe import price shocks following the liberalization of Russian energy prices, and the dislocation caused by the loss of the breakaway region of

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[7] The year 1991 has been chosen as an initial point because it corresponds to the independence. However, most of the data about the labour market are available from 1999 onwards. Data before 1991 are difficult to obtain and to compare with the subsequent period. In this section we report mainly annual data.

Transnistria, home to a majority of Moldova's heavy industry. The economy contracted every year between 1992 and 1999, [8] with the sole exception of 1997, because the agricultural sector benefited from a favourable weather condition. [9] The economy contracted again in the late 1990s following the collapse of the Russian rouble in 1998. The poverty rate increased sharply in 1999, triggering substantial outward migration. The average annual growth rate during 1994–99 was negative, equal to -4 per cent. During this phase, the economic differences between Moldova and other transition countries accentuated. The slow restructuring of the energy sector and the political instability further delayed economic recovery. The country's dependence on the Russian Federation as a crucial export market has been a source of serious constraint, although trade with the EU has now been expanding.

Real GDP growth resumed in 2000, and averaged around 6 per cent in 2000–04. It fell to 5 per cent in 2006 and 3 per cent in 2007, reflecting the Russian Federation's import ban on a range of agricultural goods, as well as a severe drought in 2007, which led to a sharp drop in agricultural output. Domestic demand has increasingly become the main driver of growth. Although some of the boost in household consumption might be explained by rising wages, growth has largely been sustained in recent years by sizeable inflows of remittances. Moldova had one of the world's largest per-head remittances inflows. Most were channelled into consumption and, to a lesser extent, housing construction. As a result, the Moldovan economic recovery has been driven primarily by consumption. According to the IMF (Article IV, 2007), there are signs that the model of consumption-driven growth financed by remittances is shifting in Moldova in recent times. According to the data, investment was increasing and foreign direct investment (FDI) picked up to 11 per cent of GDP in 2007 from 7 per cent in 2006.

The projections by IMF (Article IV, 2007) showed that the macroeconomic outlook for 2008 and beyond appears favourable: growth is projected to pick-up in 2008 and 2009. [10]

1.2. A comparative analysis

One way of evaluating the Moldovan macroeconomic performance and its dynamics during the period under study is to compare them with other transition countries. For comparative references, we have chosen the following countries, which experienced transition phase in the early 1990s and for which data were available: Albania, Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Poland, Romania, Slovak Republic, Slovenia and Ukraine.

All the countries presented in the table experienced a varied but positive growth, except Moldova and Ukraine. Between 1991 and 2007, Albania, Estonia and Poland experienced the highest proportionate growth rates in real terms at above 100 per cent. In Moldova the real GDP was lower in 2007 than in 1991, and it experienced the lowest growth rate of -25 per cent among the selected countries; Ukraine also experienced a negative growth rate of -11 per cent. In terms of GDP per capita in 2007, Moldova turned out to be the poorest country. In 1991 Albania had the lowest GDP per capita, equal to 2,546 constant 2005 international $ (CI$), followed by Moldova with CI$3,232. In 2007 Moldova had the lowest GDP per capita of CI$2,417, while it was CI$6,028 for Albania.

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[8] WB data.

[9] For a detailed analysis of the period 1990–99, see Ronnas and Orlova, 2000.

[10] However, these projections did not take into account the current financial crisis.

It is evident that while the majority of these transition economies have been successful in transiting to a new economic and political situation, Moldova has failed to do so and it is far behind the Central and Eastern European standards. We will offer some explanations afterwards about that.

Table 1. **GDP per capita, PPP** (constant 2005 international $)

Country	GDP in 1991	GDP in 2007	Growth
Albania	2 546	6 028	136.8
Bulgaria	7 049	10 665	51.3
Czech Republic	14 404	22 505	56.3
Estonia	9 659	19 927	106.3
Hungary	10 925	17 960	64.4
Latvia	8 958	16 536	84.6
Lithuania	11 806	16 683	41.3
The former Yugoslav Republic of Macedonia	7 499	8 065	7.6
Republic of Moldova	3 232	2 417	−25.2
Poland	7 451	15 401	106.7
Romania	6 854	10 756	56.9
Slovak Republic	10 709	19 241	79. 7
Slovenia	14 679	25 576	74.2
Ukraine	7 369	6 528	−11.4
Source: WB.			

The following figure shows the average annual growth rate for the two sub-periods 1991–99 and 2000–07, and for the whole period 1991–2007. Moldova experienced the sharpest fall in average annual growth rate during 1991–99, while the positive average annual growth rate in 2000–07 was not sufficient to offset the initial downturn. Moldova shows the lowest average growth rate of -2 per cent; the country with the second lowest growth rate is Ukraine with -1 per cent.

Figure 3. **Average annual growth rate** (1991–99, 2000–07, 1991–2007)
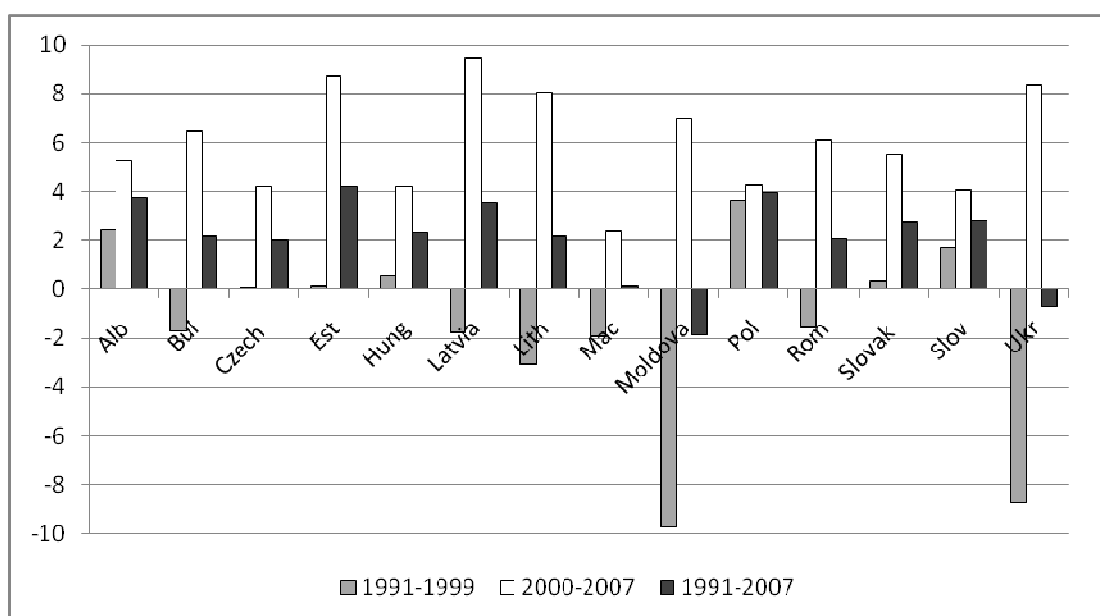
Source: Own elaboration from WB.

Figure 4 reports the investment share of GDP in 1993 and 2003. Investment is one of the major drivers of economic growth. All countries presented have experienced an increase in the share of investment, except in Romania, Moldova and Ukraine. In particular, Moldova and Ukraine experienced a large reduction in the share of investment to GDP, of about 60 per cent, while Romania reduced its share by 19 per cent from 1993 to 2003. Moreover, in 2003 Moldova and Ukraine had one of the lowest shares of investment in GDP at 9 per cent.

However, it should be noted that the graph below presents gross investment, regardless of whether the expenditures for investment are used to add to the capital stock, or simply to replace worn out or obsolete capital. The portion of investment spending that is used to replace worn out and obsolete equipment – depreciation – while essential for maintaining the level of output, does not increase the size of the capital stock. In some transition economies, such as Moldova, a large proportion of resources was devoted to replace worn out and obsolete equipment.

Figure 4. **Investment share of GDP** (percentage)
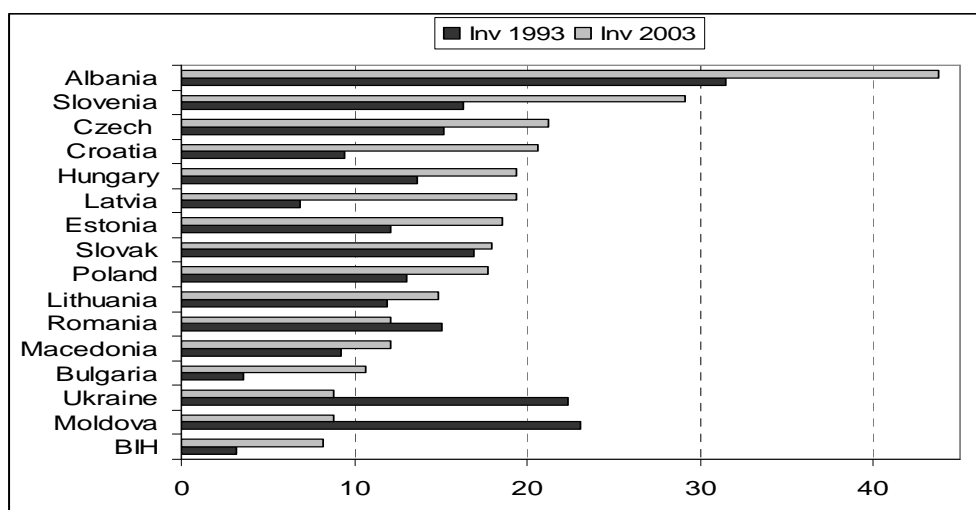
Source: PWT.

We now present the only indicator of the labour market available for this international comparison. Figure 5 shows the unemployment rate in 1999 and in 2006 for the selected countries. This time period was chosen because of the availability of data. Unemployment rate declined in most countries, except Romania and Hungary. However, for some transition economies, the unemployment rate captures only a very limited portion of the reality in the labour markets. This indicator should be examined together with the data on outward migration and activity rates, as discussed in section 3.

Figure 5.   Unemployment rates
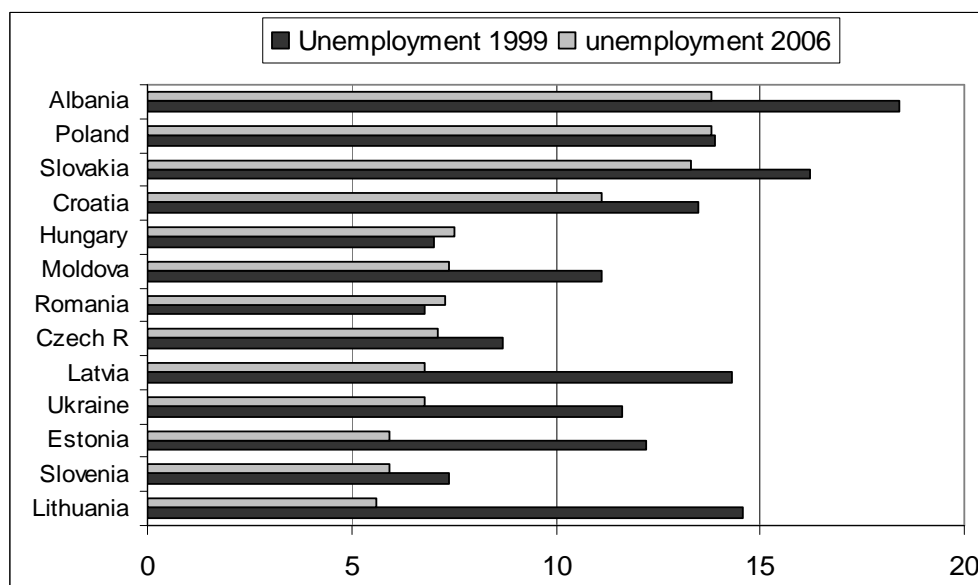
Source: ILO.

1.3.   Sectoral analysis of the Moldovan economy

The transition period was accompanied by a significant change in the output structure, as figure 6 shows. Agriculture has been a dominant sector of the Moldovan economy, particularly in comparison to other countries in table 1. It became increasingly important throughout the 1980s and the early 1990s. Agriculture's share in the economy showed two distinct patterns since independence: first, between 1990 and 1992 its share increased, while industry contracted and services decreased sharply. Second, from 1993 onwards, its share gradually declined. In 1992 and 1994 a drought devastated the local harvest and the country imported grain.

Agriculture still remains an important sector, accounting for around 18 per cent of GDP in 2006 and employing a 34 per cent of the workforce in 2006. However, the country's location renders agriculture vulnerable to marked changes in weather conditions, and production accordingly fluctuates widely. Traditional agricultural production is a risky activity, exposed to bad weather conditions, such as late spring or severe drought. Favourable weather conditions helped agriculture in 2001–02 and in 2004–05. However, bad weather in 2003 proved devastating for the grain crop, and in 2007 Moldova experienced a very bad drought.

The majority of individual farmers produce low value-added crops because they lack the necessary resources and knowledge to produce more profitable crops. The agricultural sector is very limited in technologies and innovation. Many farmers are engaged in subsistence production, with a very low income. As part of the Soviet Union, Moldovan agricultural structure was based on large collective and state farms (*kolhozes* and *sovchozes*, respectively). With independence, this sector underwent a process of decollectivization. A 1997 study (*Centrul de Investigatii Strategice si Reforme*, 1997) of the rural population in Moldova indicated that only 16 per cent wanted to become independent farmers. The main reasons highlighted by those reluctant to become farmers were the absence of necessary equipment and materials (around 32 per cent), old age and poor health (18 per cent), lack of legal guarantes (16 per cent) and a reluctance to change their lifestyle (15 per cent). Moreover, a crucial issue for the emerging private agricultural sector was the access to markets, primarily abroad (Ronnas and Orlova, 2000).

Figure 6.   Sectoral composition of GDP
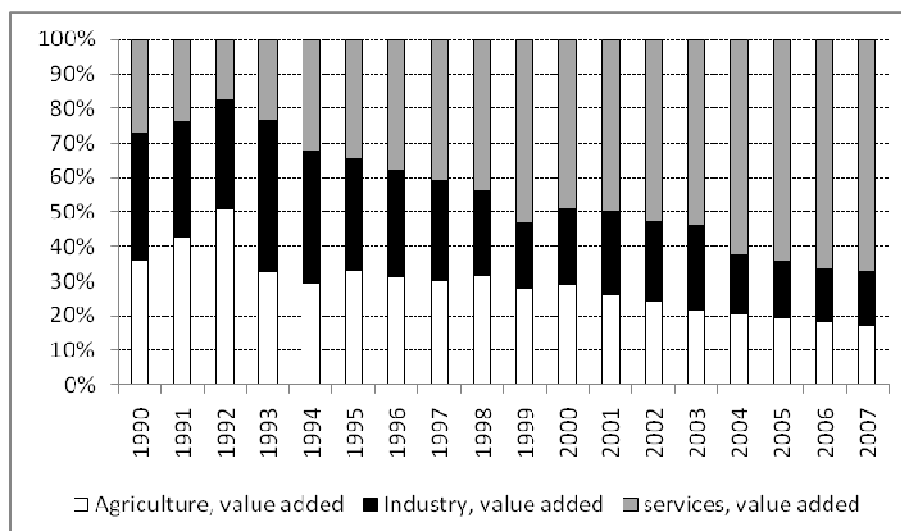
Source: WB.

During the early phase of transition, Moldovan industrial sector was seriously affected by an intense de-industrialization as well as by breakaway of the heavily industrialized region of Transnistria. The liquidation of industrial enterprises had an immediate effect on income through liquidation of jobs. The share of industry in gross value added decreased and its share stabilized at around 20 per cent of GDP in 2006. Moreover, as Ronnas and Orlova noted, during the pre-independence era the industrial plants were constructed under the assumption that energy and other raw materials could be obtained at low or no cost, and as a consequence, the technologies used were highly energy-intensive. Reliance on energy supplies from the former Soviet Union has caused serious problems for Moldovan industry since independence, not only because of the payment of energy at full cost, but also because of the increase in energy prices.

The Moldovan industry can be characterized by a dependence on agricultural inputs and a lack of product and export diversification. As a result, the Moldovan industry remains extremely vulnerable to climatic and external economic shocks. The manufacturing industry is dominated by food-processing and beverages sector. Producers in this sector were badly hit by the Russian ban on Moldovan wine in 2006–07: the share of total industrial output fell sharply to 33 per cent in 2007 from 45 per cent two years earlier. The production of wine, the most important product, fell by 50 per cent in 2006 and by a further 30 per cent in the following year. The structure of the industry is also still limited in technologies and innovation.

As with many transition economies, the service sector was initially underdeveloped, accounting for 23 per cent of GDP in 1993. The share of services, including trade and transport, has been growing steadily since independence, reaching 67 per cent of GDP in 2006. The literature has pointed out the importance of shifts from agriculture to industry since the seminal contribution of A. Lewis (1954); some models predict faster growth for those economies that move resources more quickly out of agriculture. [11] However, in the case of Moldova, an overly simplistic interpretation of the relationship between inter-sectoral shifts in resources and economic growth is not possible due to substantial outmigration that originated in the agricultural sector.

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[11] See Feder, 1986, among others.

The patterns of change in output shares are analogous to those in employment, with a substantial decline in agriculture, significant rise in services and a relatively stable share for industry, as figure 7 reveals. In the early 1990s agriculture accounted for almost half of total employment. Employment in the agricultural sector dropped significantly since then, from 49 per cent of total employment in 1999 to 34 per cent in 2006. This was in part due to the structural change in the economy and partly to the fact that emigration and the withdrawal of many discouraged workers mainly came from this low-productivity and low-pay sector. The output share for agriculture was generally lower than the employment share due to the low productivity levels in this sector; the contrary was the case for industry and services, attributable to higher productivity.

Employment in the service sector increased noticeably, from 38 per cent in 1999 to 49 per cent in 2006. This increase can be partly attributed to the growth of previously undersized service sector activities and partly to the rise in informal service sector activities.

According to the NBS data, the number of employed in agriculture declined in both urban and rural areas between 2003 and 2007. In the rural areas, the share of employment in agriculture (though decreasing) still remained higher than the share in non-agricultural branches (though increasing).

Figure 7. **Employment by sector** (percentage of total employment)
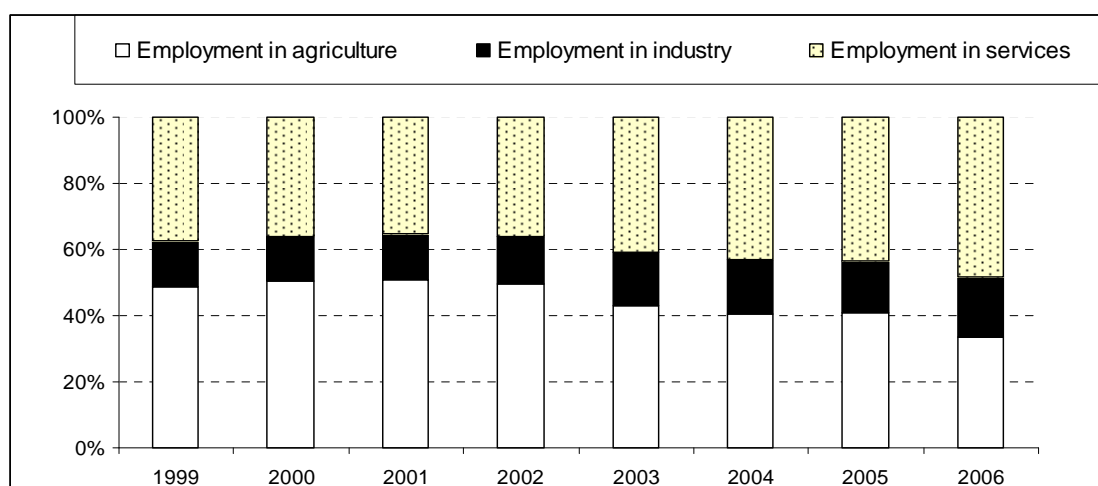
Source: NBS.

The causes of structural change shown in figures 6 and 7 are complex. An important role was played by the rate and the direction of technological progress. At the same time, in the transition phase, the service sector increasingly incorporated activities previously done in the industrial sector, and this phenomenon also provoked an increase in the share of service sector. Furthermore, the economic restructuring and the downsizing of enterprises left many workers with little choice but to move to the informal economy. [12] According to the 2003 labour force survey (LFS) results, 51 per cent of workers in services, communal household and communal services, trade and related activities in urban areas had informal jobs. Torm (2003) noted that all CIS countries experienced a significant rise in services, primarily driven by an increase in informal service activities. The relatively high percentages of service sector's contributions to total GDP were, to a large extent, attributable to the prevalence of informal service activities.

[12] ILO, 2002.

1.4. Population

The composition of the population also changed in line with the industrialized countries: both fertility and mortality decreased. The population of Moldova shrunk by almost 10 per cent since independence according to the results of the 2004 census, and this decrease has been steady as figure 8 shows, and this has been mainly because of emigration.

Figure 8. **Population** (thousand)
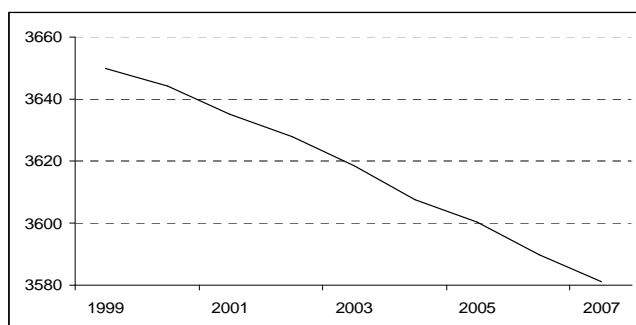
Source: NBS.

Among European countries, Moldova has consistently had the highest share of rural population: it is a predominant rural country, with only around 42 per cent of the population living in the urban areas (WBDI, 2006). According to the National Human Development Report (2006), the level of well-paid employment in non-agricultural activities in the rural areas was still very low compared to the urban area. As a consequence, part of rural population migrated, if not abroad, from villages to town, and the percentage of rural population has decreased over time. [13] Overall, there was a distinct tendency for a decrease in rural population and an increase in the urban population.

1.5. Labour market

At the outset of economic transition it was impossible for every country to maintain levels of employment that prevailed in the socialist period. Adjustment period was necessary to counterbalance the job losses resulting from the dismantling of large public enterprises and the process of privatization by a substantial employment generation in the private domestic sector.

1.5.1. Migrants and remittances

Moldova's migrant labour force has received considerable attention because of the conditions that many Moldovan workers have endured abroad and the important role that remittances play in supporting the local economy. The surge in migratory trend started in 1999 in the wake of the regional financial crisis, and it subsequently accelerated till 2004. An increasing number of Moldovans is working abroad and workers' remittances increased steadily as figure 9 shows. A majority of these flows was used to fund household consumption, consumer durables, purchasing of housing and debt repayments. A small part was directed to finance business investment or to be saved in a bank account. While exports increased, workers' remittances have led to an even faster increase in imports; as a result, the trade deficit has widened considerably as shown later.

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[13] WBDI, 2008.

Large labour outflows reflect significant wage differentials, even with nearby transition countries, as well as the limited success with which new productive jobs have been created in Moldova.

Figure 9.   **Remittances** (percentage of GDP) **and migrants** (thousand persons)
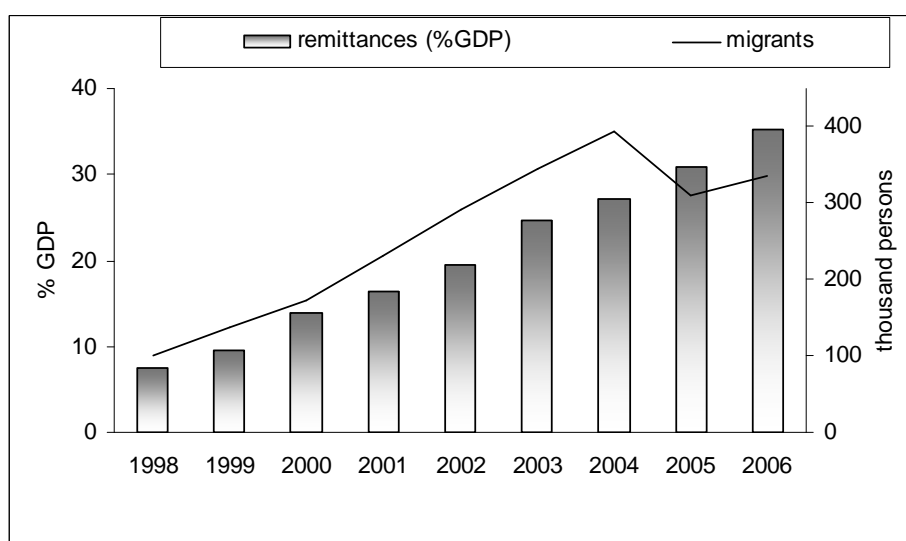
Source: WB and NBS.

Moldovan workers' remittances also played a crucial role in helping alleviate poverty: in 2000 the percentage of population living below $2.15 per day (PPP values) was 45 per cent, and it was 11 per cent in 2004. [14] However, the inflows of remittances exerted appreciation pressure on the Moldovan leu (MDL) and pumped liquidity into the system, fuelling inflation.

As table 2 shows, most of the migrants belonged to the rural population, where the economic and social conditions were worse than the ones of the urban population.

Table 2.   **Migrants** (thousand persons and percentage)

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total migrants	99.3	138.3	172.0	231.2	291.0	345.3	394.5	310.1	335.6
Urban (% of total)	43.5	40.6	39.5	34.0	30.8	30.9	28.4	29.9	30.7
Rural (% of total)	56.5	59.4	60.5	66.0	69.2	69.1	71.6	70.1	69.3

Source: NBS.

Migrants mainly have secondary education, but the country has also been losing an increasing number of high-skilled people with higher education, enhancing the process of brain drain. Only less than 1 per cent of migrants had primary education or less.

[14] PPMU.

Table 3.   Migrants by level of education (percentage of total)

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Primary or no education	1.1	0.4	0.3	0.4	0.3	0.6	0.7	0.6	0.5
Gymnasium	14.3	17.7	18.4	20.1	21.1	21.4	22.3	23.8	22.0
Lyceum	34.2	26.5	24.5	26.5	26.5	26.6	28.2	27.3	27.9
Secondary professional	30.1	34.0	35.5	33.3	32.2	32.0	28.4	26.0	27.5
College	13.2	13.6	13.9	12.3	12.0	11.9	12.4	13.8	13.7
Higher	7.0	7.7	7.4	7.4	7.9	7.6	7.9	8.5	8.3

Source: NBS.

At 35 per cent of GDP in 2006, Moldova's dependence on remittance flows was the highest among transition economies we have considered in subsection 1.2.

Figure 10.   Remittances (percentage GDP) **in 2006**
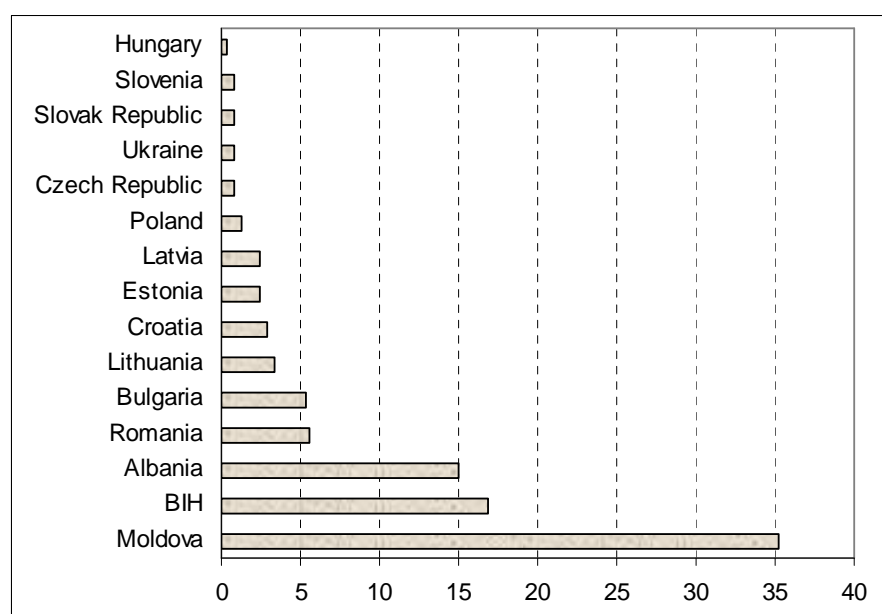
Source: WB.

1.5.2. Employment, unemployment and inactivity

In Moldova the unemployment rate does not provide a good picture of the labour market. The rate of unemployment fell from over 8 per cent in 2004 to 3 per cent in 2008. However, such shift in unemployment rate is difficult to interpret due to the volume of discouraged workers who have left the labour force and those who joined the labour force abroad. Among the unemployed, there was a high (but decreasing) share of long-term unemployment, [15] which amounted to 45 per cent of total unemployment in 2004. Albeit on the decrease, the presence of a high share of long-term unemployed is worrying, because the probability of finding a job tends to decrease with duration of unemployment and it generates negative consequences, such as weakening of professional skills and of

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[15] The standard definition of long-term unemployment is all unemployed persons with continuous periods of unemployment extending for a year or longer (52 weeks and over).

linkages with the job market, and loss of social status. Long-term unemployment also provokes an increase of discouraged persons. Reducing the duration of unemployment constitutes a key element in labour market policies.

The fall in unemployment rate was not accompanied by an increase in domestic employment, as figure 11 shows, due to outmigration and an increase of economically inactive population. Only non-agricultural employment increased in the recent years, in line with a reduction in agricultural employment and an increase in the service sector employment. It is evident that this increase in non-agricultural employment was not sufficient to offset the reduction of employment in the agricultural sector.

Figure 11.   Employment
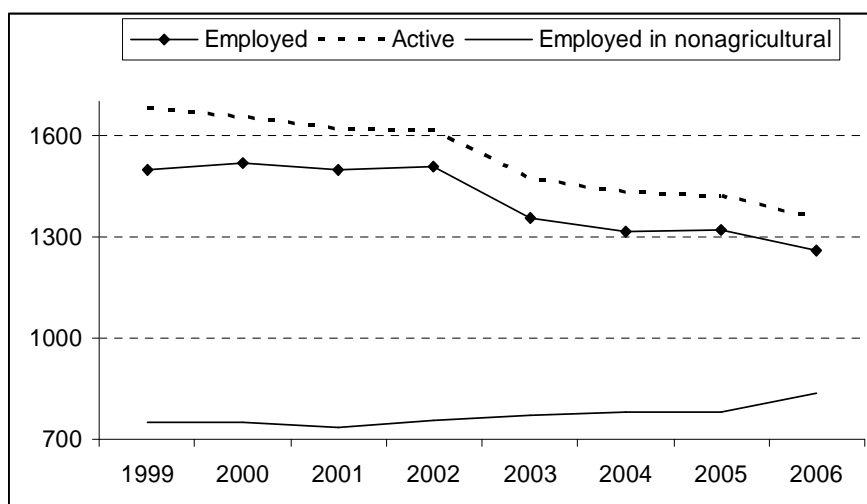
Source: NBS.

The activity rates have constantly decreased, mainly due to the presence of discouraged workers. Many workers have become discouraged by a lack of job opportunities and have withdrawn from the labour force. By definition, discouraged persons are those people, among inactive persons, available to work in the next 15 days, who have declared being in search for a job but did not undertake active search process during the last 4 weeks or who do not seek jobs due to the following reasons: they thought that there were no available places or did not know where to seek for work; they did not feel professionally prepared for the job; they believe that they will not find a job because of their age or they have been seeking for a job previously and did not find anything. At the same time, the reservation wage may have increased because of the possibility to earn higher wages abroad. An increased gap between the reservation wages and incomes that can be gained while staying inactive should exert a positive pressure for workers to actively search. Hence, declining activity rates may be reflecting the predominantly negative effect of discouragement on participation. It can also be reflecting greater incentives and means to enrol in higher education by the remittance-receiving household members.

The pattern of discouraged workers has not been steady; it reached the maximum level of 95,000 persons in 2001 and subsequently decreased to 59,000 persons in 2006. The number of economically inactive population increased steadily since 1999.

Table 4. Distribution of population by the participation in economic activity

	1999	2000	2001	2002	2003	2004	2005	2006
	Thousand persons							
From total population:								
Economically active population*	1 682	1 655	1 617	1 615	1 474	1 432	1 422	1 357
Employed	1 495	1 515	1 499	1 505	1 356	1 316	1 319	1 257
Unemployed	187	140	118	110	117	116	104	100
Economically inactive population	1 964	1 984	2 014	2 008	2 138	2 171	2 173	2 228
Of which discouraged	83	91	95	78	76	82	71	59

* According to data of Labour Force Survey in households.

Source: NBS.

1.5.3. Informal employment

Informal employment refers to jobs not covered by existing regulations concerning conditions of employment, entitlements to employment benefits and social protection, either because they are exempted from these regulations (de jure informal) or because the regulations are not applied or enforced on them (de facto informal). [16]

In Moldova during the transition process, many people have gone into the informal economy because they could not find jobs or were unable to start businesses in the formal economy or could not afford to be unemployed. According to the ILO (2002), the root causes of this expansion can be found in the economic and social transformations, including the closure of many state-owned enterprises and privatization of others, the collapse of the social insurance system, and the reduction of real incomes for a large part of the population. At the same time, legal reforms have typically not kept up with the new economic framework, and weak institutions and enforcement mechanism might have also contributed to this phenomenon.

The work in the informal economy cannot be termed "decent" compared to the recognized, protected, secure formal employment (ILO, 2002). The lack of contractual arrangements with formal guarantees for this high share of Moldovan employed population is worrying. Shifting workers out of the informal economy into the formal economy would ensure legal and social protection of all workers, increase productivity of informal economic activities, and facilitate development and recognition of skills. Informal workers are characterized by a high degree of vulnerability, because their employment is highly unstable and their incomes are low and unstable. According to LFS (2003), 46 per cent of people in informal employment were unable to report the number of usual weekly hours of work, while the same share for people in formal employment was 15 per cent. The high proportion of persons in the informal employment without constant weekly hours of work indicates that working time patterns in informal economy is very much irregular. Not surprisingly, there is also a link between working in the informal economy and being poor. In general, average incomes in the informal economy are much lower than those in the formal economy; and the working poor are concentrated in the informal economy, especially in the rural areas.

A pilot survey to measure informal employment started in the first quarter of 2003. The share of informal employment in total employment was at its maximum in the first

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[16] See footnote 37 for a proper definition.

quarter of 2003 at 39 per cent (the first observation available), while in the last quarter of 2007, it was 32 per cent. In Moldova, recent improvement in the labour market consists of a gradual reduction in the number of informal occupations, ranging from 502,000 in the first quarter of 2003 and reaching the value of 382,000 in the last quarter of 2007.

Figure 12. Employed by formal/informal occupations (percentage of total)
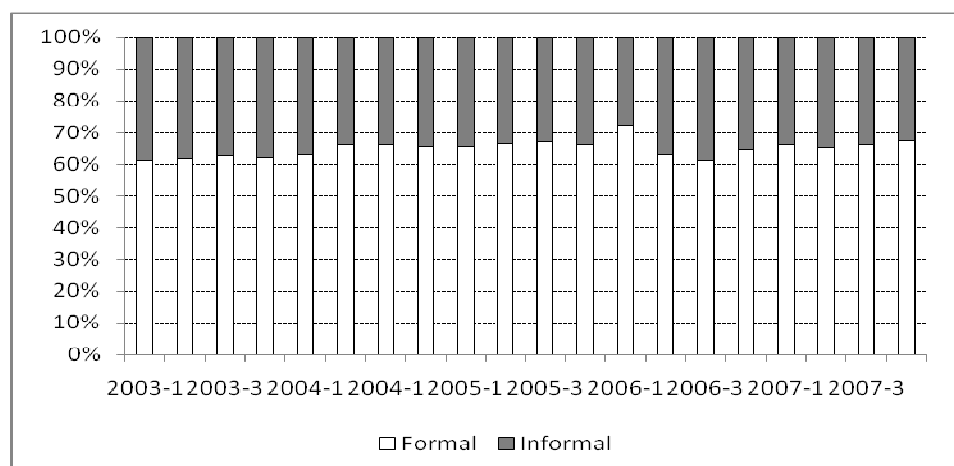
Source: NBS, quarterly data.

1.5.4. Wages

The average wage for the whole economy was equal to 112 MDL in 2001 (first quarter), and it increased to 279 MDL in 2008 (first quarter), as table 6 shows. The real wages increased by almost 150 per cent between 2001 and 2008.

Table 6. Real wages (base = respective quarter of year 2000)

Year–quarter	Real wage	Year–quarter	Real wage
2001 1	112	2005 1	199
2001 2	101	2005 2	201
2001 3	121	2005 3	206
2001 4	115	2005 4	183
2002 1	137	2006 1	228
2002 2	139	2006 2	234
2002 3	154	2006 3	239
2002 4	152	2006 4	204
2003 1	171	2007 1	250
2003 2	172	2007 2	260
2003 3	174	2007 3	254
2003 4	160	2007 4	217
2004 1	190	2008 1	279
2004 2	192	2008 2	279
2004 3	192	2008 3	277
2004 4	169		

Source: NBS, quarterly data.

The increase in wages reflects rising productivity, the ongoing expansion of the economy and government wage policies, but it is also a function of remittances and labour emigration. Sectors such as construction have been facing a booming demand and are paying higher wages in order to keep Moldovan workers from moving to higher paying markets abroad.

According to a survey conducted in 2001, [17] workers quit their jobs mainly due to low wages (56 per cent) and chronic wage arrears or refusal of employer to pay them (19 per cent). The lowest salaries were paid in the agricultural sector and the highest in the service sector, In the first sector the average real salary was 100 MDL in 2001 (first quarter) and it increased to 235 MDL in 2008 (first quarter). The average salary paid in the service sector was 112 MDL in 2001 (first quarter) and 261 MDL in 2008 (first quarter). The increase in real wages was indeed accompanied by substantial productivity gains in the service sector, followed by agricultural and industrial sectors.

In absolute terms the average monthly wage nevertheless remained low, even by the standards of the region. The Moldovan wage was still less than 40 per cent of the Russian average and only around one third of the average wage in neighbouring Romania. [18] With the level of wages so low, most Moldovans depend on other sources of income to survive, including earnings through additional work in the informal economy and remittances from relatives working abroad.

1.6. The public sector

The size of the Government in Moldova is rather big, and according to the IMF this size is excessive for a country at Moldova's level of development. Gradual retrenchment of the public sector over the medium term is important to provide room for the private sector that accounts for around four-fifths of GDP. Public sector wages lag behind the private sector, and a poorly designed pay structure creates difficulties in attracting and retaining skilled employees.

A distinction should be made between productive and unproductive government activities (Barro, 1990). The former are expected to be growth-promoting while the latter growth-retarding; investment in education and infrastructure typically represent "directly" productive public expenditure which crowds in further private investment.

The following table shows fixed capital investment by forms of ownership in percentage terms. The share of public fixed capital investment has increased overall since 1998, but not in a constant way, In particular, it has decreased since 2002.

[17] CISR: Unemployment in Moldova.

[18] EIU, 2007.

Table 7. **Fixed capital investment by forms of ownership** (percentage)

	1998	1999	2000	2001	2002	2003	2004	2005
Public	28.8	38.8	43.4	30.9	38.9	34.6	32.6	32.6
Private	31.7	22.2	22.3	28.8	33.4	36.4	32.2	37.0
Mixed *	7.9	4.3	4.6	6.4	2.7	3.3	3.6	3.4
Foreign	5.8	3.1	5.3	9.5	5.2	4.9	9.7	8.0
Joint ventures	25.7	31.7	24.4	24.4	19.8	20.7	21.9	19.0

*(Public and private), without foreign participation.

Source: NBS.

The following table shows the share of public spending on education, as a percentage of government expenditure. This share shows an oscillatory trend: since 1999 it increased to a peak value of 24 per cent in 2003, followed by a decrease to 19 per cent in 2004 and then it increased again. However, this share was still lower in 2006 than it was in 1991. Retrenchment of the public sector should not be done at the expenses of growth-promoting government activities, that also improves the employability and earning prospects of entrants to the labour market.

Table 8. **Public spending on education, total** (percentage of government expenditure)

1991	1999	2000	2001	2002	2003	2004	2005	2006
21.6	16.4	16.8	21.3	23.9	24.3	19.3	19.4	20.2

Source: WB.

The share of employment in the public sector was slowly decreasing as figure 13 shows.

Figure 13. **Share of public and private employment** (percentage of total)
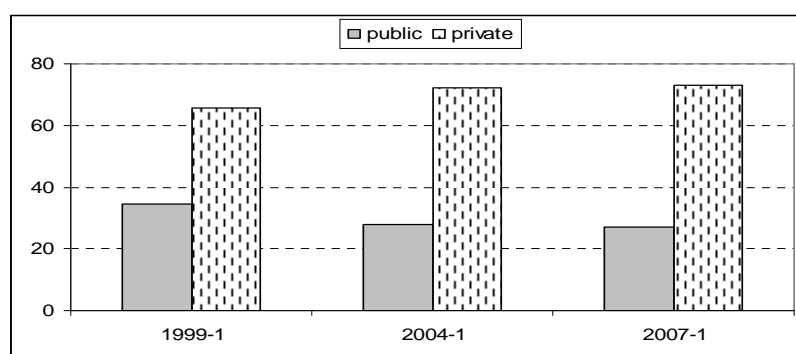
Source: NBS.

To describe the progress in transition the European Bank for Reconstruction and Development (EBRD) uses a set of transition indicators ranging from 1 to 4+, where 1 represents little or no change from centrally planned economy and 4+ represents the standards of an industrialised market economy. The privatization process is one of the areas used for this assessment. According to the EBRD, large-scale privatization process has improved in the recent years. The year after the declaration of independence, there was little private ownership (=1, the lowest score), while in 2007 some progress has been made, with more than 25 per cent of large-scale enterprise assets in private hands or in the process of being privatized (with the process having reached a stage at which the state has

effectively ceded its ownership rights), but possibly with major unresolved issues regarding corporate governance (the corresponding score is 3). This score has been stable at 3 since 1995; therefore, since 1995 no significant progress has been made in the field of large scale privatization.

At the same time, Ronnas and Orlova (2000: 29) noted that privatization of many enterprises in the key sectors, such as food processing and energy, has been difficult because of large arrears and obsolete equipment, together with a perceived lack of economic stability, acting as a deterrent to potential investors. There was more need to reconstruct rather than to just restructure.

The poor economic, financial and managerial state of most of the units of industrial enterprises has been a major impediment for privatization. In Moldova the Agency for Restructuring and Enterprise Assistance (ARIA) was created as part of two large Private Sector Development Projects financed by the World Bank, to partly solve this impediment.

1.7. Monetary policy

The National Bank of Moldova (NBM) became a fully independent central bank with its own administrative council in November 1993. In January 1994 the NBM became fully responsible for monetary policy. The NBM's powers were strengthened through two laws drafted in 1993 and enacted in July 1995. The NBM is responsible for monetary policy and price stability, management of foreign exchange reserves, and for supervision of the banking system, including licensing. With change in the Law of the NBM, price stability has become the primary objective of monetary policy and direct lending to the Government has been prohibited.

The Chisinau-based Moldovan Stock Exchange opened for business in June 1995. The MDL, the national currency, was launched on November 29, 1993. Although the exchange rate is market-determined through daily currency auctions on the Moldovan Interbank Currency Exchange, the central bank operates an informal peg to the dollar. The MDL appreciated substantially in the late 1990s and early 2000s. Against the euro, the exchange rate has remained quite stable since about 2003, as figure 14 shows.

Figure 14.   Exchange rate, MDL/euro
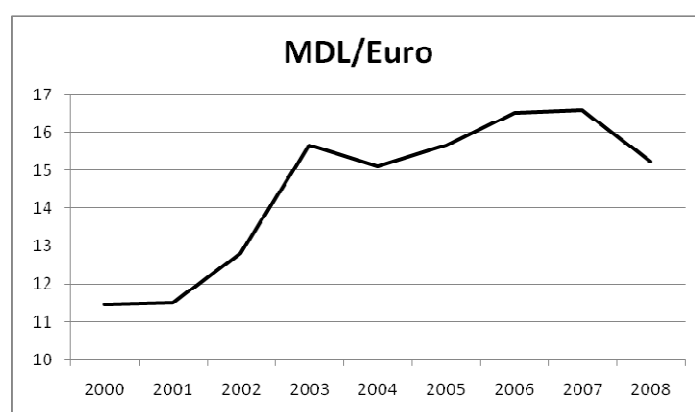
Source: Bank of Italy.

Notwithstanding, markets appear uncertain about the NMB's true objectives. [19] It is in the NBM's interest to ensure that markets clearly understand the policy framework; otherwise, the signalling function of monetary policy will be muted. To help the understanding of macro-financial linkages, the NBM needs to improve its transparency practices and strengthen its communication strategy, including a "public education campaign" of frequent press releases, public appearances, newspaper articles, and analytical publications (IMF, 2008). Unfortunately, even with the best efforts, the process of building confidence and reputation may take time (Barro and Gordon, 1993).

The monetary transmission channel in Moldova is rather weak, compared with more advance European economies. The reason is not only the perceived uncertainty about monetary policy objectives, which undermines the credibility of the NBM and weakens its function, but also the underdeveloped financial markets and the lack of banking competition.

1.8. The financial sector

The financial sector mediates the investment projects, and it has been growing relatively quickly. Nonetheless, it still remains small relative to GDP and many firms find it difficult to get access to credit. Recently, foreign investors were allowed to purchase domestic banks: this can be considered an encouraging sign according to the IMF (2008).

The 2004 Financial Sector Assessment Program (FSAP) identified the following critical issues in the banking sector:

– the implementation of the "fit and proper" standards for owners of financial institutions to overcome the opaque ownership structure of a relatively large number of banks;

– the Government's role in the banking system and the privatization of Banca de Economii;

– a close cooperation among supervision agencies.

Since then, many recommendations provided under the 2004 FSAP have been implemented. The main progresses have been made in the issue of ownership structure of banks, even if further effort is still needed in this regard. The privatization of Banca de Economii has been slow as the selected evaluation experts had a conflict of interest. In addition to the existing subsidiary of foreign banks, three acquisitions occurred in 2006–07, accounting for only slightly more than 20 per cent of total assets.

Banks should be required to provide additional information to the public, such as posting on their websites their full financial statements, the bank charters and an annual statement of the extent of conformity of their disclosure with the Corporate Governance Code.

Only two bodies – the National Bank and the National Commission on the Financial Market – have regulated financial and capital markets since 2008. In 2007, a regulator, the National Commission on the Financial Market (NCFM), replaced the National Securities Commission. The NCFM supervises the securities market, insurance sector and non-bank financing. The NCFM is operationally independent. The Commission adopted a Corporate

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[19] For example, in September 2007 commercial banks were caught by surprise when the NBM "unexpectedly" raised its policy rate.

Governance Code and passed new regulations intended to simplify the issuance of corporate securities and increase transparency of transactions at the Moldovan Stock Exchange.

The banking system has consolidated over the recent years, with number of commercial banks falling from 20 in 2000 to 15 by late 2008, as table 9 shows. Moldovan banks are the main source of business financing, with non-bank financing, albeit growing, poorly developed. The banking system has two levels: the National Bank of Moldova and 15 commercial banks. The NBM supervises the commercial banks and reports to the Parliament. Stress tests, carried out by the IMF (2008), aimed at simulating possible shocks, showed that the banking sector as a whole can withstand them.

The banking sector is still relatively small; the assets of the sector amounted to 54 per cent of GDP, while lending represented only 33 per cent of GDP in 2007. The relatively low level of financial intermediation is partially due to the early stage of market development and the widespread use of cash in the economy. Despite the continuous growth of deposits in banks that indicates an increasing confidence in the banking sector, cash holdings are still prevalent, and they are supported by the inflow of remittances through official and unofficial channels.

Improvements in the regulatory environment were focused on the insurance sector. The insurance sector is still underdeveloped both relative to its potential and compared to neighbouring countries. Several factors, such as low per capita income, low understanding of insurance products, low public confidence in the sector, and lack of necessary prudential regulations contributed to low insurance penetration.

Table 9.   Banking and insurance sector

	2000	2001	2002	2003	2004	2005	2006	2007*
Number of banks	20	19	16	16	16	16	15	15
Total assets of the banking system (% GDP)	29	31	35	38	42	48	52	54
Credit to non-governmental sector (% GDP)	14	16	19	22	23	27	31	33
Deposits (% GDP)	–	–	–	25	30	37	39	40
Number of insurance companies	45	44	49	43	38	32	33	33

*30 June 2007.

Source: IMF, 2008.

1.9.   The trade sector

Moldova, unlike other countries in Central and Eastern Europe, has been very slow in diversifying foreign trade. EU trade restrictions and subsidies in agriculture, where Moldova has a comparative advantage, were important factors that affected Moldova's access to the EU and other markets. There were other factors which compromised the ability of Moldovan producers to sell successfully in the EU market. According to the World Bank (2004), these included the additional costs that Moldovan firms incurred relative to their rivals in other countries in clearing customs, in transporting goods to the market, in financing investment and working capital, and in complying with standards and technical regulations.

The country is dependent on traditional low value-added products; the technological and capital intensity of exported goods remained low. In 2007 Moldovan exports consisted mainly of foodstuff, alcoholic and non-alcoholic drinks (21 per cent), textiles (21 per cent) and vegetable products (12 per cent), as figure 15 shows. The bans imposed by the Russian Federation caused a trade shock: in 2005 the Russian Federation imposed bans on both meat and vegetable products; in March 2006 it banned all Moldovan wine and wine-based imports. These bans were lifted in November 2007, but wine exporters now operate under much stricter conditions and have found it difficult to regain the earlier share in the Russian wine market. The Russian Federation accounted for more than 70 per cent of Moldovan wine sales, and the effect on export revenue was dramatic. Moldova has been redirecting its exports to the EU market: by 2007 the EU took 51 per cent of Moldovan exports. As figure 15 shows, the share of foodstuff, alcoholic and non-alcoholic drinks decreased. Moldova's low labour costs continued to provide a comparative advantage, particularly in textiles whose share increased from 7 per cent of total exports in 1997 to 21 per cent in 2007. The textiles and clothing sector, the most important component of light industry, is Moldova's second largest exporter. This has led to an increase in private sector employment and a recent slowdown in emigration.

Figure 15.   Exports by section (percentage of total)
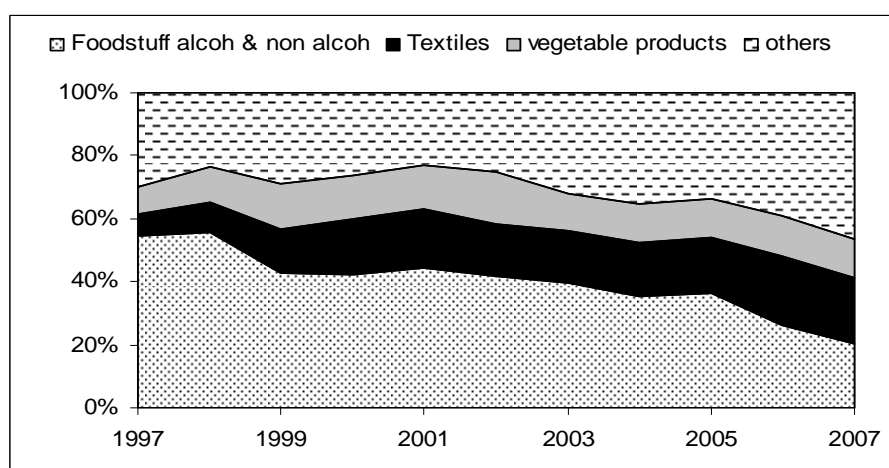
Source: NBS.

As table 10 shows, the bulk of exports traditionally went to the CIS markets, and to the Russian Federation in particular. This reflects historical trade links and similarity in consumer tastes, as well as Moldova's difficulty in penetrating the EU market.

Relations with the CIS have been uneasy and have caused domestic debate, as well as political and economic instability. The Moldovan economy has been very dependent on trade with the former Soviet Union, particularly in the 1990s. Trade with other countries has, however, been growing fast. The shock suffered by Moldovan exports in 1998 as a result of the Russian financial crisis caused a pronounced rebalancing of destination of exports to the EU, mainly driven by textiles expansion. In 2007 a majority of exports was directed to the EU countries (51 per cent of total), and 41 per cent was directed to the CIS. Notwithstanding, Moldova's main destination market continues to be the Russian Federation. Moldova's comparatively low wages enable it to retain a comparative advantage in labour-intensive products against other central European countries, which are increasingly losing their clothing businesses to cheaper locations. However, like all textiles exporters, it remains vulnerable to China's low-cost manufacturing.

With few exploitable indigenous energy resources, Moldova depends overwhelmingly on energy imports. Import was dominated by energy, traditionally supplied from within the

Soviet Union. [20] Imports were concentrated in energy and capital goods: energy supplies continued to be the largest item of import expenditure, although they have fallen considerably as a share of total imports. In the first quarter of 1995 they represented 48 per cent of total imports and in the second quarter of 2008 the value was 19 per cent. Moldova's imports were mainly obtained from the Russian Federation and Ukraine.

Table 10. **Main trading partners** (percentage of total)

	2003	2004	2005	2006	2007
Exports fob to					
Russian Federation	39.0	35.9	31.9	17.3	17.3
Ukraine	7.1	6.6	9.2	12.2	12.5
Italy	10.4	13.8	12.2	11.1	10.4
Romania	11.4	10.0	10.2	14.8	15.7
CIS	53.6	51.0	50.5	40.3	41.0
EU countries	38.9	40.7	40.6	51.1	50.6
Imports cif from					
Ukraine	23.2	26.1	20.9	19.2	18.6
Russia	15.5	13.8	11.7	15.5	13.5
Germany	9.7	9.1	8.3	8.0	8.7
Italy	6.8	6.2	6.6	7.3	7.3
CIS	42.3	43.2	39.5	37.9	36.1
EU countries	45.2	43.8	45.3	45.2	45.6

Source: NBS.

Imports of goods and services occupied a high percentage of final consumption expenditure, as the following figure shows. Since 2000 consumption started to grow steadily. Imports followed the same trend; and they represented between 75-84 per cent of total consumption. This relationship can help to explain the employment rates in Moldova: Moldova is a case of consumption driven growth, where the abundant inflows of workers' remittances have fuelled consumption. But, consumption has been mostly directed to goods and services produced abroad rather than locally. This had clear implications for the observed employment rates in Moldova.

In the period of recovery exports increased rapidly, ranging from 47 per cent of GDP in 1999 to 73 per cent of GDP in 2006, and at the same time, increase in consumption due to remittances led to a remarkable increase in imports, as figures 16 and 17 show. As a consequence, net exports in Moldova reached the negative level of 44 per cent of GDP in 2006. Moldova's trade deficit averaged 28 per cent of GDP annually in 2000–05, before reaching the level of 53 per cent of GDP in 2007; trade deficit can represent a serious constraint to the economy. The increase in the recent years reflected commodity prices, strong remittance-fuelled import demand and the difficulties in diversifying Moldova's limited exportables.

[20] EIU, 1996.

Figure 16.   Consumption and Imports
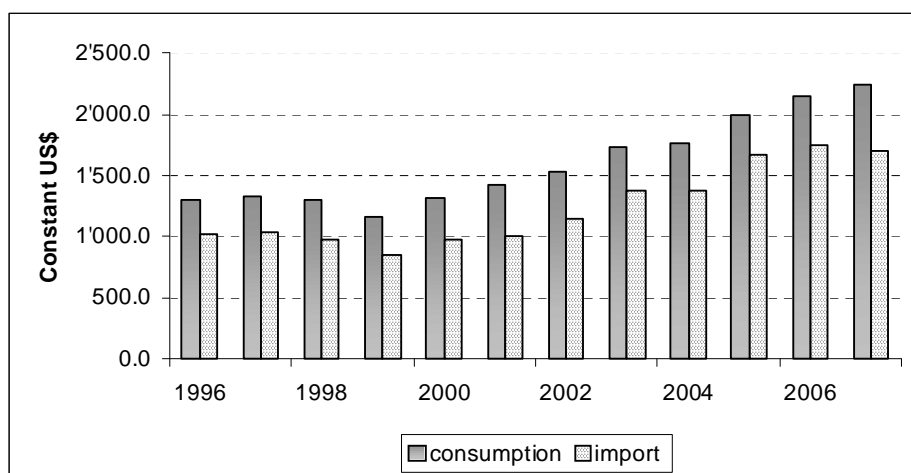
Source: WB.

Figure 17.   Exports and imports (percentage of GDP)

Source: NBS.

Unlike other CIS countries, Moldova lacks one of the most important factors for attracting *foreign investment*: natural resources. From this point of view Moldova is one of the least attractive countries for foreign investors.

After a peak in 2000, FDI in Moldova decreased in 2001 and subsequently started to increase again. FDI inflows rose to more than 11 per cent of GDP in 2007. However, the value of cumulative FDI inflows was still one of the lowest in Eastern Europe. In 2005, the Russian Federation was the single largest investor, accounting for 21 per cent of total FDI; EU countries accounted for around 40 per cent of the total.

FDI as a share of GDP was quite high in Moldova. However, as in many other CIS countries, the relatively high share of FDI in Moldova's GDP can be mainly explained by a small denominator (GDP), than by a big numerator (FDI). A labour-intensive industry, based on the assembly of imported materials, attracted substantial foreign investment because of Moldova's low wages.

According to the data from the State Registration Chamber,[21] in the period 1994–2007, 5,896 companies with foreign capital were registered and they represented

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[21] Popa, 2007.

4 per cent of the total number of companies and organizations listed in the State Register. The number of "Greenfield" projects with the participation of FDI was 13 in 2004 and reduced to six in 2006.

The slow development of FDI in Moldova could be explained by the following factors:

(1) Moldova ranked 106th (out of 150) on the 2007 Logistics Performance Index; Moldova's weakest logistics indicator was the quality of transport and IT infrastructures. The country faced infrastructural shortages, and it experienced a slow progress in modernization of transportation institutions. Moldova was also ranked a low of 122nd on the Trade Across Borders subcategory, because of its deteriorating road networks. Poor infrastructure inevitably has a negative influence on the growth of FDI.

(2) In Moldova, perceived instability, market distortions, high production and transaction costs also discouraged FDI. The unsolved conflict in Transnistria and a relatively high perception of corruption do not create a friendly business environment, which may enable the development of foreign and domestic firms and closer linkages between them. Corruption acts as an additional tax on FDI, increasing the risks and diminishing the rate of return on investment. Some indicators [22] revealed the existence of unofficial payments.

(3) The difficulties and costs of obtaining funds for working capital and investment were serious obstacles to entrepreneurship, by both domestic and foreign agents.

The recent improvements in regulatory and administrative domain were linked to reforms initiated by Moldovan authorities in order to reduce the administrative burden and costs of getting licenses and permits.

The following tables show some indicators of Moldovan business environment. According to these tables, there have been many improvements both for the Opening a business indicators and for the Evolution of cost of licensing activities. The registration costs for opening a business decreased by more than 50 per cent in five years. The duration of obtaining a license decreased from 29 days in 2002 to 20 days in 2007, and its average cost decreased by 45 per cent. Simplifying business rules and procedures and reducing transaction costs, such as cost of licensing activities, encourage entrepreneurship and facilitate formalization. Legal environment plays an important enabling role for enterprise development.

Table 11.   Opening a business indicators

Indicators	2002	2003	2004	2005	2006	2007
Duration of registration, days	23	26	28	23	20	16
Registration costs, US$	132	147	142	53	62	60

Source: The Cost of State Regulation of the Enterprise Activity, 2007, provided by NBS.

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[22] National Human Development Report, 2006, and table 11.

Table 12.   Evolution of cost of licensing activities

	2002	2003	2004	2005	2006	2007
Share of enterprises subjected to licensing (%)	–	–	–	68	58	56
Average number of licences	3	2.2	2.6	1.9	2.9	1.8
Duration of obtaining a licence, days	29	22	32	25	20	20
Average cost, US$	522	456	517	303	273	286
Share of unofficial payments (%)	38	28	13	8	9	8

Source: The Cost of State Regulation of the Enterprise Activity, 2007, provided by NBS.

The share of unofficial payments decreased significantly. This last indicator relates the entrepreneurial performance to the level of corruption in the country. In relation to other countries, the corruption perception index has not been stable: Moldova ranked 111th out of 179 countries with a score [23] of 2.8 in 2007, 88th out of 158 countries with a score of 2.9 in 2005 and 100th out of 133 countries with a score of 2.8 in 2007.

The Government of Moldova has taken measures to fight corruption by implementing the "guillotine law", which eliminated costly and obsolete regulations and forced the publication of all business-related regulations. All regulations and governmental decisions related to business activity have been published in a special business registry. These steps were intended to raise awareness of business people about their rights, increase transparency of business regulations, and help fight corruption. A second "guillotine law", the Law on Basic Principles Regulating Entrepreneurial Activity, was enacted in August 2007.

[23] A score of 10 indicates a perception of no corruption, while 0 means corruption is seen as rampant.

Section 2 – The theoretical framework

This section analyses the theoretical framework on economic growth, investment and employment growth. There is a vast literature on economic growth and investment, and on the determinants of economic growth; whereas the literature on the determinants of employment growth has been less explored.

An explicitly neoclassical framework that identifies accumulation of physical capital as a key driver of growth is the basis for most empirical growth works; other theories have generally used the neoclassical model as a baseline from which different approaches are explored. The neoclassical framework is the cornerstone of economic growth literature, but such base framework has limitations in explaining employment-intensity of growth, changes in the employment indicators, or trend in workers' share in income. With the neoclassical approach, too much focus has been placed on the rate of economic growth as the primary objective of economic policies, while understandings on how to induce a participatory growth process through generation of decent employment opportunities have remained relatively poor.

The availability of rich data set since the mid eighties has generated an extensive empirical literature on the causes of economic growth. During the 80s dissatisfaction with the neoclassical model, even augmented by human capital accumulation (Mankiw, Romer and Weil, 1992), has led to formulations of different theories of economic growth, called endogenous growth theories. [24] The main message of the endogenous growth theories is that the long-term growth rate is determined by government policies other institutional, determinants, and political factors. A large part of the literature on "new growth theories" emphasizes the endogenous determination of growth rates. Empirically, for the determinants of long-run growth, emphasis is placed on the role of governments, trade policy, financial system, monetary sector, institutions and administration system, and protection of intellectual property. Hence, the "new growth theories" attempt to explain economic growth by grounding the process within the existing institutions and their evolution, as well as political interplay between different groups of agents.

While the new approaches provide more space to explore the employment dimension of economic growth, in the absence of complete formal models, which framework should be deemed relevant has become an empirical question: attention has shifted to the relation between theory and data. But most of empirical works reach different conclusions. Robustness analysis becomes crucial in order to discriminate between a potential quasi-infinite numbers of variables, determinants of growth. The problem of model uncertainty lies "at the centre of the recent empirical debate". [25] A very high number of variables was found to be correlated with growth. As Sala-I-Martin, Doppelhofer and Miller (2004: 814) noted, cross-country growth regressions provide the *"most extreme example"*: the number of proposed explanatory variables was approximately the same as the number of countries for which data was available; all-inclusive regressions are therefore impossible. And it is difficult to identify the subset of determinants that really matters.

2.1. A brief review of determinants of growth

The growth determinants, proposed by the endogenous growth theories, are supposed to affect growth, and not level effects on output; the extension will allow us to understand

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[24] See Romer, 1986; Lucas, 1988; Romer, 1990, among others.

[25] Capolupo, 2005: 8.

the impacts that particular policies might have on the long-run performance of the Moldovan economy. Their impact and significance are briefly discussed below.

2.1.1. *The public sector*

In the basic growth models, economic policies are inefficacious in the long run. In the Solow (1956) and Ramsey (1928) models of competitive equilibrium, the Government cannot bring about efficiency; public consumption and the way it is financed do not influence growth rates. In particular, in the Ramsey model, an increase of government consumption implies a reduction in disposable income and therefore a reduction in private consumption, with no effects on capital. In the overlapping generations framework, [26] government policy has only level effects; however, the growth rate of the economy is determined in the long run only by exogenous variables.

The theoretical link between government policy and output growth is provided by Barro (1990); Kneller, Bleaney and Gemmell (1999); and Bleaney, and Gemmel and Kneller (2001), among others. The overall size of government in the economy may influence growth in two opposite directions. On one hand, government size might constrain efficiency and economic growth for the following reasons:

– high tax rates may imply economic distortions; in general, taxes are growth reducing. People invest less in assets that are taxed;

– the Government may allocate resources poorly: nothing automatically ensures that its actions are executed efficiently;

– public bureaucracy may involve diseconomies of scale, increasing burdens, barriers and obstacles to economic activity.

According to the data of WB and EBRD there is a positive relationship between the degree of large scale privatization and GDP growth in the transition economies.

On the other hand, government size exercises a positive effect on economic performance:

– In the presence of market failures, government interventions are necessary to ensure a socially optimum outcome for growth and development. For example, the Government can regulate exploitation of the so-called "commons"; it can harmonize conflicts between social and private interests to induce cooperative outcomes; or it can address resources to where they are required but where there are no private incentives to do so. Markets do not work in a social vacuum. The governments can support the efficient working of the markets by providing and enforcing underlying rules, by developing supporting institutions, and by taking corrective actions when markets fail, which is quite often the case in reality.

There is no ideal size for the State, and size alone does not capture its full effect on markets. On theoretical grounds, there has been a controversy: public expenditure can be growth enhancing but the financing of such expenditures can be growth retarding. Theory seems to offer little guidance.

Government activities are generally divided into productive and unproductive ones. The former are expected to be growth-promoting while the latter growth- retarding; education and infrastructure represent a typical "directly" productive public expenditure. In

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[26] See Samuelson, 1958, and Diamond, 1965.

the Barro model (1990) the growth effects of various government tax and expenditure policies depend on their classification as one of two types. Decreases in distortionary taxes and increases in productive expenditure raise the steady state rate of growth, while non-distortionary and non-productive expenditure have no direct effect. In this model, the analysis of the chosen method of financing the government budget constraint is fundamental to examine the growth effect of any particular change in fiscal policy.

Considering productive activities, public education expenditures may positively affect growth. The Government plays an important role in financing formal schooling, which is generally considered the key channel for human capital accumulation. The overall result depends on the size of the Government, the tax structure and the parameters of the production technologies.

Empirically no consistent evidence exists for a significant relationship between government spending and growth, in a positive or negative direction (Kormendi-Meguire, 1985; Grier-Tullock, 1989). Results of significant correlations differ by countries, and within a country across regions, analytical method and categorization of government expenditure. [27]

2.1.2. The monetary and financial sector

The literature on economic growth has also paid attention to the effects of changes in the rate of money creation and in the rate of inflation on real variables. [28] Models of endogenous growth allow testing the relationship between the growth rate of money and that of the economy. "Monetary neutrality implies that the growth of real output should be unrelated to the anticipated growth rate of money supply", [29] measured by the rate of money growth.

In recent years the empirical evidence has been in favour of negative relationship between rate of inflation and growth (Kormendi and Meguire, 1985; De Gregorio, 1993; Levine and Renelt, 1992; Rubini and Sala-i-Martin, 1992). A recurring theme is that inflation increases uncertainty; it will tend to introduce undesirable noise into the workings of markets, for instance by raising relative price variability. Planning will become more difficult, and if inflation is perceived to be costly, this belief may become self-fulfilling. [30] Therefore, according to this theory, Moldovan authorities should pursue the goal of stable inflation.

Some other empirical results (Briault, 1995; Kocherlakota, 1996) suggest that inflation is harmful, but the evidence is not overwhelming. The basic finding is that very high inflation goes together with a lower rate of economic growth, but inflation up to 20 per cent a year may or may not.

The role of financial system in the growth process has received considerable attention. Greenwood and Jovanovic (1990) examined the relations between growth and income distribution and between financial structure and economic development. In their model, financial structure has positive effects on economic growth due to more efficient undertaking of investment and more efficient capital allocation.

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[27] Levine-Renelt, 1992, and Easterly Rebelo, 1993, provide good surveys of empirical results.

[28] Chirichiello, 2000.

[29] Kormendi and Meguire, 1985.

[30] Heymann and Leijonhufvud, 1995, and Temple, 2000a.

Different reasons justify the positive relationship between the financial system and growth. Generally speaking, an efficient and vibrant financial system is an important precondition for private sector development: the financial market plays a vital role on the levels of savings and investment and in mediating between the two. Financial instruments, markets and institutions arise to mitigate the effects of information and transaction costs (Levine, 1997). The financial system mobilizes savings and allocates them to investments by private entrepreneurs. It links savers and borrowers, manages risks, and operates the payment and settlement systems. In addition, it can help shift resources from declining to dynamic sectors. The banking sector, the size of liquidity of the stock market, the level of the banking sector and stock market development play a crucial role.

The endogenous growth literature stressed the influence of the financial system on economic growth (Bencivenga et al., 1995; Greenwood and Smith, 1997; Obstfeld, 1994, among others). In an AK model, Pagano (1993) concluded that financial deepening affects growth by converting saving to investment. Benhabib and Spiegel (2000) suggested that financial development affects growth both through its contribution to factor accumulation rates and total factor productivity growth.

Empirical works on the relationship between financial development and economic growth are growing, but they often reach different conclusions; empirical results are very sensitive to model specification. Cross-country and panel data studies find positive effects of financial system on growth, while time series studies give conflicting results, such as in Arestis and Demetriades (1997). Demetriades and Hussein (1996) also found little systematic evidence of a positive relationship.

The overall depth of bank intermediation activity is measured by the ratio of total banking sector assets to GDP (WB 2004). This ratio is an indicator of financial development (IMF, 2005). Figure 18 shows the positive relationship between total assets and GDP per capita. Data was available only for the following countries: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Slovak Republic, and Slovenia. In 2004 Moldova had the lowest ratio of total banking sector assets to GDP.

Figure 18.   Total banking sector assets and GDP per capita
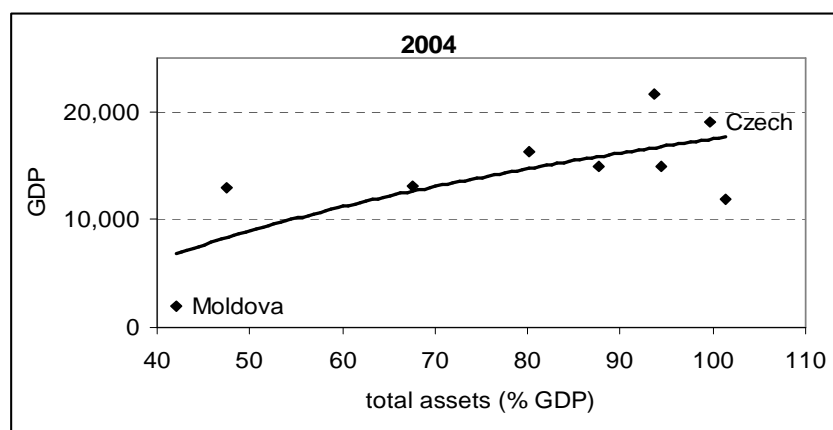
Source: Own elaboration from WB.

2.1.3. Trade policy

There are several channels, emphasized by trade theory, through which trade can affect growth. Using an example of a pin factory, Adam Smith first pointed out that trade increases market size and promotes specialization, which increases productivity and growth. This argument also forms the basis of various models (e.g. Grossman and Helpman, 1991). Trade policy is expected to have desirable growth effects through a strategy of export promotion, which reduces trade restrictions, improves economic openness, increases competitiveness and enhances efficiency.

Within the framework of new growth theories, openness plays a crucial role in the process of growth. Openness in foreign trade favours the exchange of ideas and technology transfer, as well as development of trading networks between suppliers and buyers, thus facilitating a more rapid diffusion of new products, processes and research between national economies. For example, Coe and Helpman (1995) and Coe, Helpman and Hoffmaister (1997) found evidence of substantial R&D spillovers from the industrialized countries to other industrialized countries and to less developed countries in the South. Economic openness seems to promote accumulation of knowledge, as well as human and social capital. [31]

Policies that reduce tariff barriers and dismantle non-tariff barriers would suggest positive static and dynamic gains from trade. Successful entry into the international markets has become associated with the rapid growth periods of Asian newly industrialized countries. There are several alternative interpretations of this success. It is not clear if the key factor was trade per se and the resultant gain from specialization, or competition and the associated pressure for cost minimization, or both.

Most empirical growth literature has estimated a positive correlation between openness and growth; however, some recent studies have been more dubious and found that the statistical significance of this correlation depends on the empirical model and the proxy variable for openness (Vamvakidis, 2002). In addition, the progress on the empirical side has been slower due to the fact that it is difficult to interpret the causality issue. Frankel and Romer (1999) solved the problem of endogeneity using geographical variables, showing that trade causes growth.

Though there are some ambiguities in the evidence, trade protection is by no means an element of growth strategy. At the same time, openness without diversification may increase the risk of rendering domestic economy vulnerable to external economic shocks.

FDI might become an important driving force for economic development from a theoretical point of view. Besides capital, foreign investors are supposed to bring new technologies, management practices, experience and knowledge. Nevertheless, in order to bring benefits for the host economy, a set of conditions should be satisfied: an open economy without formal and informal barriers, a favourable business environment that encourages development of backward and forward linkages within the country, reduced corruption, a developed infrastructure (traditional and digital) and an educated population. It is well known that the FDI flow to a country increases with improvement in the quality of its human capital and physical and institutional infrastructure, and with a decline in factors like policy volatility and corruption. Borenstzein et al. (1998) found that FDI is an important vehicle for transfer of technology, contributing relatively more to growth than domestic investment. However, the application of more advanced technologies and therefore higher productivity of FDI requires the host country to have a minimum threshold stock of human capital. Their conclusion is that FDI contributes to economic growth only when there is a sufficient absorptive capability of the advanced technologies in the host country.

FDI tend to take place in a vicious circle: countries with high growth rates attract FDI, which in turn leads to higher economic growth. Moreover, a favourable business climate, which is one of the preconditions for economic development, attracts FDI. Foreign investors are interested in business climate, functioning of the judicial system, guarantees offered by the host country, functioning of the market economy and transparency of its institutions.

Moreover, the host country should attract the so-called quality FDIs, those that significantly increase employment, enhance skills and boost the competitiveness of local

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[31] Bregman and Marom, 1993, among others.

enterprises. The impact of multinational corporations' (MNCs) "presence in developing countries may not necessarily have a productivity-augmenting impact on other domestic firms" (Aitken and Harrison, 1999; Meyer, 2004). MNCs might use developing countries either as production bases for relatively simple inputs for their products, or as a target for sales of products that are past their prime in the product cycle. Most companies concentrate R&D activities in their home country, and consequently the host country does not fully capitalize new developments in the field of science and innovation.

2.2.   Employment growth and its determinants

The rate of employment growth in an economy is determined by many factors, operating simultaneously. One of them is the growth rate of GDP. At the same time, employment growth also determines the current and subsequent GDP growth rate.

In the main literature the relationship between growth and employment has been extensively analysed with particular regard to the role of technological change. [32] Generally speaking, there are two opposite hypotheses:

(1)   "jobless growth" hypothesis;

(2)   the "optimistic view", according to which economic growth would feed back into employment growth.

According to the first theory, the intrinsic labour-saving nature of technological progress determines jobless growth; while the second theory emphasizes the beneficial employment effect of technological progress. The debate is rather complex, as plausible theoretical motivations are advanced from both sides; according to the OECD (1996), there is a strong association between growth and employment, while Pianta (1996) and Pini (1997) illustrated the possibility of jobless growth. At the same time, employment growth, such as economic growth itself, depends on a variety of interrelated factors.

It is worthwhile to note that according to various studies (Freeman et al., 1982; Freeman and Soete, 1987; Freeman and Soete, 1994; Vivarelli, 1995) product innovations have a positive impact on employment since they open the way either to the development of entirely new goods or to major changes in mature goods. Therefore, new products remain the most effective way to counterbalance labour-saving process innovations.

Empirical works on the relationship between economic growth and employment often reach different conclusions; there might be cases in which economic growth is not associated with employment growth. The possible explanations for such dissociation are: the growing sectors of the economy increased labour utilization rather than the number of the jobs or firms employed new technologies, resulting in higher productivity instead of job creation.

In the transition economies, the possibility of jobless growth has also been examined with regard to the issue of previous labour hoarding. According to Boeri, 2000, and Svejnar, 1999, labour hoarding at early stages of transition prevented sizeable and widespread restructuring to take place. Boeri and Garibaldi (2006) analysed a panel covering the CEE-10 in the period 1990–2002; they found that jobless growth in the New Member States is related to productivity enhancing job destruction in the aftermath of prolonged labour hoarding. Their empirical results indicate that the low employment content of growth is related to the reduction of labour hoarding inherited from central planning system and early phases of transition.

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[32] Padalino and Vivarelli, 1997, among many others.

Moldovan experience presents a very specific case; as we will show, it is necessary to illustrate the sources of growth in order to understand the pattern of employment in this country.

Economic growth is a necessary condition for poverty reduction, but it is not sufficient. Islam (2004) pointed out the importance of employment as a key link between growth and poverty alleviation. He illustrated the virtuous circle of economic growth leading to poverty reduction through growth of productive employment. And the reduction in poverty creates the possibility for further increases in productivity (through higher expenditure on health, education and skill development); investing in human capital plays an important role in boosting economic growth that could benefit the poor. Increase in productivity implies, in turn, higher rates of economic growth.

Figure 19.   The virtuous circle

Economic growth → Productive capacity → employment with rising productivity → higher income of the poor → higher expenditure on health education and skill development → increased productive capacity
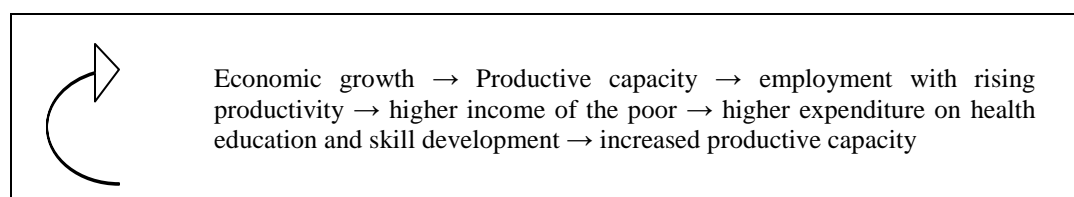
Employment growth is not always "pro-poor". Developments that contribute to poverty reduction are structural transformation of employment towards manufacturing and other non-farm sectors, better educated workers and a decrease in dependency burden, i.e. an increase in labour force participation. His empirical results showed that a shift away from agriculture to higher productivity sectors was associated with poverty reduction in a cross-country analysis of selected African, Latin-American and Asian countries. An important concern for poverty–employment linkage relates to the quality of jobs created in the service sector. According to Torm (2003), productive employment constitutes the main link between economic growth and poverty and effort to reduce poverty should focus on the informal sector.

FDI can not only bring new technology and capital to accelerate structural changes but also maintain employment. In the World Investment Report 2006, employment of foreign affiliates increased from 20 million in 1982 to 92 million in 2004. According to Enderrwick (1996) and Hunya (1998), during the 1990s FDI started to play an important role in the structure of employment in the Central European economies. FDIs have strong influence on domestic employment through types of jobs created, regional distribution of new employment, wage level, income distribution and skills transfer. Indirect or spillover effects also magnify the direct effects. The main spillover could take place through movement of trained labour from foreign firms to other sectors, employment increase for domestic subcontractors, and transmission of business culture. Moreover, the more employees receive access to new knowledge, the more they in turn can spread knowledge gained across the economy, for instance by setting up their own business. Labour mobility can thus enhance productivity throughout the economy by transferring tacit knowledge that could not be transferred through informal contracts between firms. Some empirical results on the role of FDI as employment generators showed that this role depends strictly on the economic conditions of the host country. [33]

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[33] Mickiewicz et al., 2000, examined this role for the Czech Republic, Estonia, Hungary and Slovakia. They emphasized that the positive effects of FDI on employment happen only under specific conditions. The overall impact of FDI on aggregate levels of employment varied among three identified types of FDI: distributors, local suppliers and exporters. They found that the role of FDI on employment creation/preservation was more successful in Hungary than in Estonia, Slovakia and the Czech Republic. In the last three countries, job creation in the foreign sector, though substantial, was not enough to reverse the total trend of reduction in employment.

Section 3 – Descriptive analysis of the Moldovan labour market

In this section we first present more detailed data on the Moldovan labour market, and we then discuss the main statistical properties of the quarterly data used in the next section.

3.1. Employment outcomes by education

Education in Moldova is compulsory from the ages of six to fifteen. Children are at primary school until aged ten, followed by five years of lower secondary education and either two years of general secondary education or three years at a lyceum. Tertiary education is provided by universities, academies and institutes. Vocational education, formerly geared towards highly specialized Soviet industrial requirements and taught exclusively in Russian, is being restructured along the German model. Despite the reforms, the number of students in vocational schools has fallen steadily, from around 35,000 in 1995 to around 18,000 in 2005. Over the same period university enrolment almost doubled and is now at around 115,000. Professional education comprises general, technical professional and practical components designed to develop professional competencies. Graduates of colleges and professional schools may progress to higher education, while graduates of vocational schools will join the labour market. Professional education schools offer training programmes at three levels. The first level programmes last two years, leading to a certificate of qualified worker. The second level programmes provide more specialized training and also last two years. The third level lasts one year, leading to a technician diploma. It might be important to adjust the place and role of secondary professional education to community requirements, while updating the range of professions offered in consultation with social partners, allowing for a more intensive cooperation with private companies.

Education plays a crucial role in the society not only for economic growth, but also for a complete realization of human potential and for reducing the risk of poverty. According to the National Human Development Report (2006), families headed by persons who had received higher education faced a poverty risk seven times lower than families headed by persons without any education or illiterate.

Education is an important additional resource for the population of Moldova in its adaptation to the new market conditions. Education can play an important role in modernizing the Moldovan economy and offers citizens other opportunities apart from migration.

The condition of schools in Moldova deteriorated sharply. Between 1997 and 1998 the share of schools requiring repairs increased from about one third to one half of all schools (Moldova, 1999). "When rural localities are (without electricity) for 20 (out of) 24 hours, we cannot talk about (the) efficiency of the training and educational process" (Moldova, 1999). The difference between the village and town schools was quite significant at economical, social and cultural level. Population at the school age from rural localities did not have access to the necessary information, broadcast through radio, TV, press, at least till some years ago. But these conditions are likely to have changed in the last years due to labour migration and remittances.

As figure 20 shows, the percentage of population (+15) with only primary education decreased from 13 per cent in 1999 (fourth quarter) to 8 per cent in 2007 (fourth quarter); the percentage of population with secondary professional education also reduced. Secondary includes gymnasium, secondary school and secondary specialized; the percentage of population with this level of education has oscillated over time, from 57 per cent in 1999, 55 per cent in 2003 and reaching 59 per cent in 2007.

The interest in higher education is growing, as evident from figure 20; the percentage of population with higher education increased, from 9 per cent in 1999 to 13 per cent in 2007. The level of tertiary attainment was still lower than in the Eastern European countries, but it was nonetheless increasing. These data do not disaggregate by rural and urban areas, where enrolment rates are generally higher in the latter.

Figure 20.   **Population by education** (percentage)
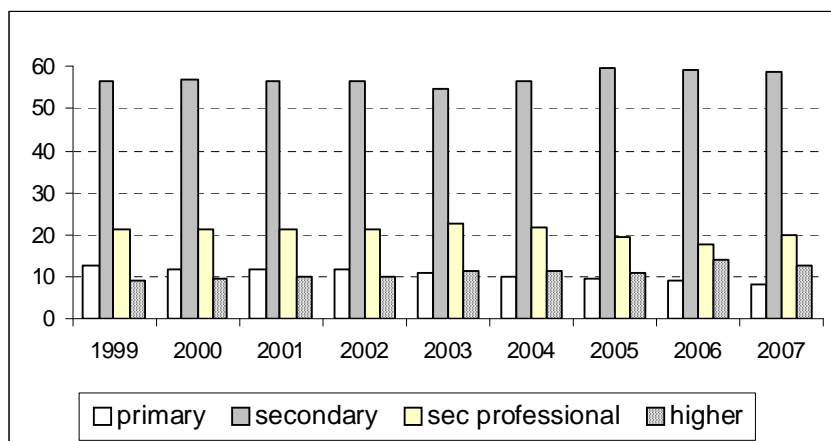
Source: NBS.

The following figure shows the percentage of people employed by education. The majority of workers have secondary education; this is not surprising as the majority of population has secondary education. The percentage of employees with primary education steadily declined, while the percentage of employees with higher education increased from 12 per cent in 1999 to 21 per cent in 2007. This pattern reveals that the labour force increasingly became more qualified and educated. [34]

Figure 21.   **Employed by education** (percentage)
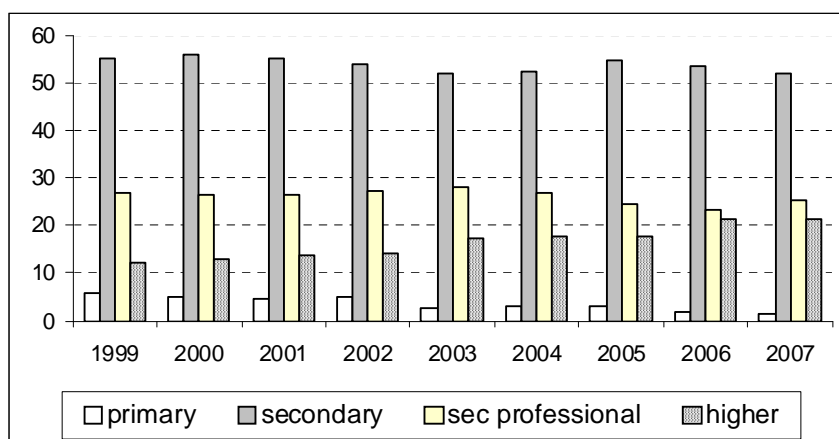
Source: NBS.

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[34] Due to the lack of data, we cannot report data on labour force by education during the 1990s, when the change of the educational system could have had a significant effect on the qualitative aspects of education.

3.2. Labour market outcomes by sex and age

The number of employed tended to decrease for both men and women. Between 1999 and 2006 the number of employed women fell by 19 per cent, while the number of employed men fell by 22 per cent: [35] the decline in employment for men has been higher than for women.

As table 13 shows, the share of employed men declined vis-à-vis women; most of the employed are men, but, at the same time, most unemployed are also men. Some of the reasons for lower share of women in unemployment in the Moldovan labour market can include a number of cultural-economic factors, such as: women themselves often accept a lower remuneration as compared to men for the same type of work; certain low-paid jobs are taken mainly by women (cleaner, yard-keeper); women prevail in some sectors, like street selling, where the activity is mainly informal and low paid; women prevail in the group of long-term migrants that actually have no expectations from the local labour market.

Though women tended to dominate in the total number in the workforce in a series of sectors, including primary education and health, men were primarily appointed in management positions. Female wages were only 70 per cent of male wages. [36]

Table 13.   Population, employment and unemployment by sex

	Population %			Employment %			Unemployment %	
	Men	Women		Men	Woman		Men	Woman
1991	46.8	53.2		50.1	49.9		61.5	38.5
2007	47.3	52.7		49.8	50.2		65.8	34.2
Source: NBS.								

As table 14.a shows, the shares of young and older people in the population have not changed dramatically. The share of young population slightly decreased, and the share of population 65 years and above slightly increased.

The share of young employed (15–24) decreased over time at a faster pace than decrease in share of youth population: form 13 per cent in 1999 to 9 per cent in 2007. At the same time, a high percentage of unemployed were youths; it was 30 per cent of total unemployment in 1999 (fourth quarter), it decreased to 26 per cent in 2005 (fourth quarter) but then it increased to 31 per cent in 2007 (fourth quarter).

Youth unemployment is usually considered as an important policy issue; young workers are more likely to be working long hours, on short-term and/or informal contracts with low pay and little or no social protection (ILO, 2006). According to the LFS in 2003, informal employment represented the majority of employed persons aged 15–19 (64 per cent).

[35] NBS data.

[36] National Human Development Report, 2006.

Table 14.a. **Population by age** (percentage of total)

| | Population % | | |
	15–24	25–34	65+
1999	23.2	16.3	12.6
2000	23.4	15.7	12.7
2001	23.6	15.3	12.6
2002	23.8	15.1	12.7
2003	24.0	14.9	12.9
2004	24.1	15.3	12.7
2005	24.0	15.4	12.8
2006	23.8	16.9	12.3
2007	22.9	16.3	13.2

Table 14.b. **Employment by age** (percentage of total)

| | Employment % | | |
	15–24	25–34	65+
1999	13.3	21.0	4.8
2000	12.9	19.5	4.3
2001	11.0	19.7	4.7
2002	10.9	18.6	5.5
2003	9.2	19.1	3.6
2004	9.2	19.1	4.3
2005	8.6	18.4	4.7
2006	9.4	20.6	3.4
2007	9.4	20.3	3.2

Table 14.c. **Unemployment by age** (percentage of total)

| | Unemployment % | | |
	15–24	25–34	35–44
1999	29.5	21.6	26.8
2000	29.2	23.5	25.1
2001	30.7	22.6	23.8
2002	22.5	24.4	27.7
2003	27.9	19.7	27.7
2004	26.7	21.6	23.8
2005	26.3	21.6	23.4
2006	33.2	19.6	23.4
2007	31.0	19.4	19.7

Source: NBS.

Prevention and reduction of unemployment among young people is one of the priorities for both labour market policy and youth policy. Regardless of the recent onset of growth, the unemployment problem among young people remains acute. In 2002 the unemployment rate among youths aged 15–19 was 15 per cent, and for those aged 20–24 it was 15 per cent, which is more than twice the country's average unemployment rate.

The main task is to reduce unemployment risks among young people, due to lack of job experience and required professional training. Employers generally face disincentives in employing young people who have to be trained and adapted to specific jobs, because this requires additional costs. In 2002 expenses for the professional training of staff accounted for only 0.4 per cent of all employers' expenses on the labour force.

3.3. Formal and informal employment

The following tables illustrate the formal/informal employment by area and economic activity; table 15 shows these data in thousand persons and table 16 in percentages. [37]

A majority of informal employment is concentrated in rural areas: in 2007 there were 319.6,000 persons in rural informal employment, while in the urban areas there were 99.8,000 persons in informal employment. In terms of percentages, the share of informal employment in total urban employment was 18 per cent in 2007: therefore, in the urban areas a majority of workers have formal employment. This percentage constantly decreased since 2003, indicating that in the urban areas the policy of reducing informal employment may have been successful. The situation was completely different in the rural areas: the share of informal employment in total employment in the rural areas was 46 per cent in 2007. Moreover, there was no signs of a steady decline in informal employment in the rural areas; the lowest percentage of informal employment was in 2004 (41 per cent), and the highest was in 2006 (48 per cent).

A majority of informal employment was concentrated in agriculture in the rural areas (81 per cent in 2007). In the urban areas, a majority of informal employment was concentrated in non-agricultural activities (93 per cent in 2007). This phenomenon is particularly worrying when we look at the number of people in informal employment by sectors and areas: in 2007, 259.1,000 persons were working in the rural areas in agricultural informal employment, while 93.1,000 persons were working in the urban areas in non-agricultural informal activities. The large differences between rural and urban areas regarding the distribution of informal employment indicates that much more effort is needed to reduce informal employment in the rural areas.

[37] Consistently with the Guidelines concerning a statistical definition of informal employment (17th ICLS 2003), informal employment comprises all employed persons who, during the reference period, had one of the following statuses in employment, either in their main or secondary activity:

(1) Own-account workers or employers working in informal sector;

(2) Members of informal producers' cooperatives;

(3) Contributing family workers, whether employed in formal sector or informal sector enterprises;

(4) Employees working in formal or informal sector, or as paid domestic workers, who meet at least one of the following criteria:

– their employer does not pay social contributions for them;

– they do not benefit from paid annual leave;

– they do not benefit from paid sick leave in case of illness;

(5) Persons exclusively engaged in the production of agricultural goods for own consumption of households, with a working week of 20 hours or more.

Table 15. **Employed persons by area and economic activity** (thousand persons)

	2003	2004	2005	2006	2007
Total employment	1 356.5	1 316.0	1 318.7	1 257.3	1 247.2
Formal employment	840.4	860.9	877.7	815.8	827.7
Informal employment	516.0	455.1	441.0	441.5	419.5
URBAN:	581.9	568.7	573.6	560.9	548.6
Formal employment	419.6	419.4	437.8	451.6	448.8
Agriculture	12.4	9.1	9.6	9.4	9.8
Non-agriculture	407.2	410.3	428.2	442.2	439.0
Informal employment	162.3	149.3	135.8	109.3	99.8
Agriculture	24.3	17.1	14.4	9.8	6.7
Non-agriculture	138.0	132.2	121.4	99.5	93.1
RURAL	774.6	747.3	745.1	696.4	698.6
Formal employment	420.8	441.5	439.9	364.2	379.0
Agriculture	225.0	237.0	237.6	129.8	133.0
Non-agriculture	195.8	204.5	202.3	234.4	246.0
Informal employment	353.8	305.8	305.2	332.2	319.6
Agriculture	321.6	269.8	274.9	273.5	259.1
Non-agriculture	32.2	36.0	30.3	58.7	60.5

Source: NBS.

Table 16. **Employed persons by area and economic activity** (percentage)

	2003	2004	2005	2006	2007
Total employment	1 356.5	1 316.0	1 318.7	1 257.3	1 247.2
Formal employment	62.0	65.4	66.6	64.9	66.4
Informal employment	38.0	34.6	33.4	35.1	33.6
URBAN (% of total employment)	42.9	43.2	43.5	44.6	44.0
Formal employment (% of urban)	72.1	73.7	76.3	80.5	81.8
Agriculture (% of urban formal)	3.0	2.2	2.2	2.1	2.2
Non-agriculture (% of urban formal)	97.0	97.8	97.8	97.9	97.8
Informal employment (% of urban)	27.9	26.3	23.7	19.5	18.2
Agriculture (% of urban informal)	15.0	11.5	10.6	9.0	6.7
Non-agriculture (% of urban informal)	85.0	88.5	89.4	91.0	93.3
RURAL (% of total employment)	57.1	56.8	56.5	55.4	56.0
Formal employment (% of rural)	54.3	59.1	59.0	52.3	54.3
Agriculture (% of rural formal)	53.5	53.7	54.0	35.6	35.1
Non-agriculture (% of rural formal)	46.5	46.3	46.0	64.4	64.9
Informal employment (% of rural)	45.7	40.9	41.0	47.7	45.7
Agriculture (% of rural informal)	90.9	88.2	90.1	82.3	81.1
Non-agriculture (% of rural informal)	9.1	11.8	9.9	17.7	18.9

Source: NBS.

Table 17 shows that the majority of people in informal employment are constituted by own account workers, while the formal sector is composed mainly by employees. A high share of own-account workers can be taken as an indication of low job growth in the formal economy, where those who cannot find formal employment undertake income earning activities of last resort. It is also interesting to note that approximately one third of informal employment consist of employees.

Table 17. **Employed persons by type of job** (percentage)

	2003	2004	2005	2006	2007
Formal employment					
Employees	82.0	78.5	78.1	85.0	84.5
Employers	0.9	1.0	1.0	1.5	1.4
Own account workers	17.0	20.6	20.9	13.5	14.1
Others	0.1	0.0	0.0	0.1	0.0
Informal employment					
Employees	34.7	36.3	32.9	33.9	31.5
Employers	0.0	0.1	0.0	0.0	0.0
Own account workers	59.0	60.6	63.8	57.7	61.5
Others	6.3	3.0	3.3	8.4	6.9
Source: NBS.					

Figure 22 shows the evolution of people in informal employment and of workers with only primary education.

Figure 22. **Informal employment and workers with primary education** (thousand persons)
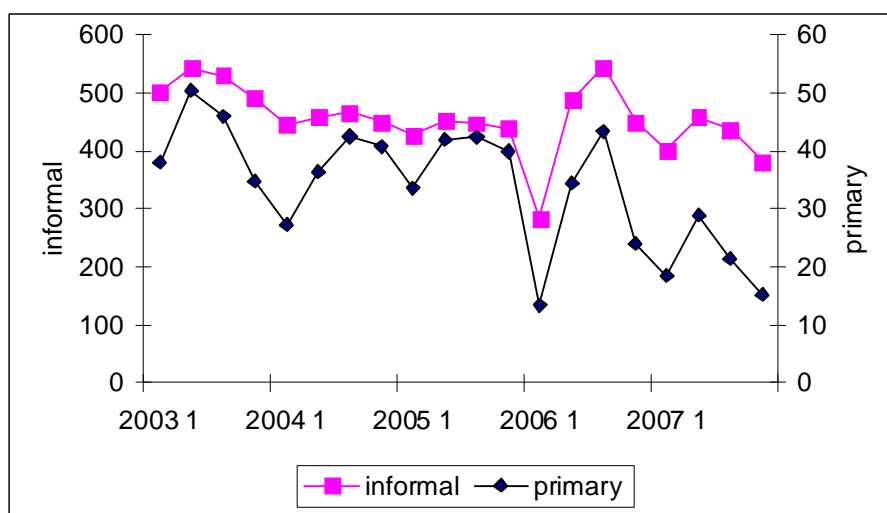
Source: NBS, quarterly data.

The correlation between informal employment and workers with primary education is positive and equal to 0.79. This shows that informal employment and low levels of education are positively correlated. Also according to the LFS in 2003, persons in informal employment tended to have a lower level of education than persons in formal employment. Moreover, according to the figure, since 2003 the number of people in informal employment and with primary education gradually declined. The graph presents only a statistical relationship between informal employment and workers with primary education (the former). However, informal employment outcome is likely to be driven by a complex set of factors.

3.4. New job creation by sector

Given the trend in the labour market, it is evident that not enough formal jobs had been created for all those seeking work, forcing people to find employment or to create their own work in the informal economy.

The following figure shows new jobs created by sectors. Job creation peaked in 2007, and during the whole period majority of jobs were created in the service sector. An important concern is about the quality of the jobs created in the service sector. It would be interesting to have some information about the quality of the jobs; however, due to the data constraints, we cannot distinguish between formal/informal jobs created.

Figure 23.   News job creation by sector (units)
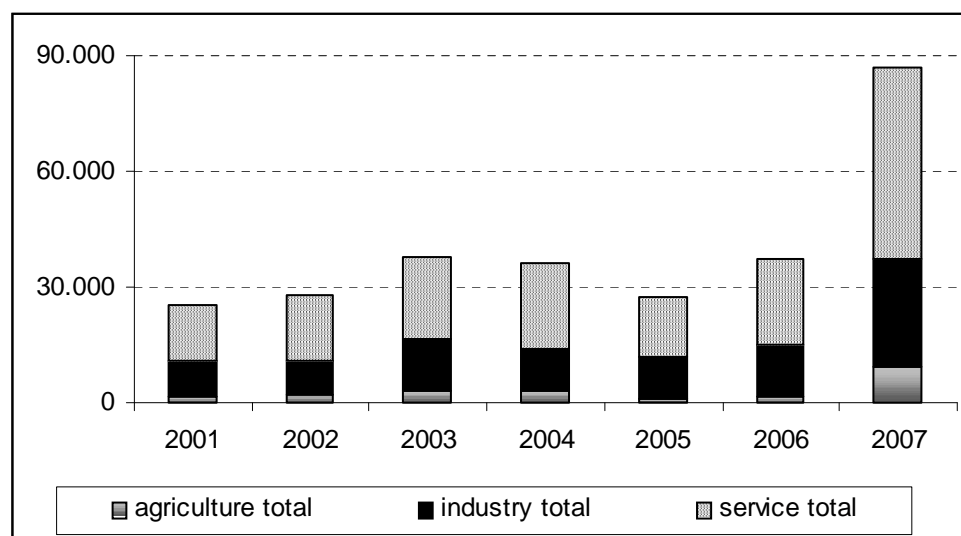
Source: NBS.

Table 18 provides a picture of output and employment growth for the whole economy and for the economic sectors.

Table 18.   Average annual growth rates

Whole economy

	Growth rate of GDP	Growth rate of employment
1994–2005	0.41	–1.97
1994–99	–6.86	–1.96
2000–05	7.68	–1.98

Agriculture

	Growth rate of value added	Growth rate of employment
2000–05	1.51	–4.90

Service

	Growth rate of value added	Growth rate of employment
2000–05	11.48	1.08

Source: Own elaborations from NBS, WB and ILO.

Table 18 reveals many interesting facts. Concerning the whole economy, between 1994 and 2005, average annual GDP growth rate was positive but less than 1 per cent, while employment fell by 2 per cent. Subdividing the period into 1994–99 and 2000–05, average annual employment growth was negative in both sub-periods, while output fell in the first period and grew at a positive rate in the second period. In the second period, a positive GDP growth rate was highly likely to have been driven by inflows of remittances. Because remittances and consumption trend was closely correlated, GDP growth was mainly determined by an increase in consumption, which did not have a direct effect on employment growth. At the same time, increase in GDP with reduction in employment can be explained by higher productivity attained and by migration of the labour force. The employment reduction followed by the transition to the market economy had not been offset by a sufficient generation of employment in the private sector.

In different economic sectors, GDP value added grew in every sector. In the agricultural sector, output growth was accompanied by a reduction in employment, partly because of large outmigration. In the service sector, the increase in value added was accompanied by an increase of employment.

We have also run an ordinary least square (OLS) regression between log difference of employment and GDP growth, using quarterly series provided by the NBS. The series were quarterly adjusted. Both series are found to be stationary, that is integrated of order zero (in symbols, $I(0)$), residuals are not serially correlated and there are no ARCH effects; [38] therefore, the OLS estimators are efficient. However, the coefficient on quarterly GDP did not show a statistically significant relationship with employment growth, as table 19 shows.

Table 19.   Employment elasticity

Dependent Variable: D4EMPL

Sample (adjusted): 2000Q1 2006Q4

Included observations: 28 after adjustments

Variable	Coefficient	Prob.
Constant	–0.017	0.479
D4GDP	–0.142	0.709
R-squared: 0.0055		
Adjusted R-squared: –0.0328		

Moreover, the adjusted R-squared of this regression is considerably low. This result warns us that other factors might explain the pattern of employment in Moldova in the last ten years and other empirical techniques and variables should be used to derive some significant conclusions and implications from the data. This regression is also potentially difficult to interpret, since it is clear that output and employment, in a general equilibrium framework, are jointly determined endogenous variables. A deeper analysis should be carried out to find the structural determinants of employment growth.

[38] We have carried out a Lagrange multiplier (LM) test for autoregressive conditional heteroskedasticity (ARCH) in the residuals. The variance of the error term conditional on GDP growth rate is not influenced by the volatility of the previous observations. This means that the employment elasticity is not spreading more widely around the linear trend in the GDP growth rate.

Time-series analysis, stationarity and unit root

A key concept underlying time series process is that of stationarity. A time series is covariance stationary if it has the following three characteristics: (1) it exhibits mean reversion in that it fluctuates around a constant long-run mean; (2) it has a finite variance that is time-invariant; and (3) it has a theoretical correlogram that diminishes as the lag length increases.

Stationarity is an important characteristics because if the series is non-stationary then all the typical results of the classical regression analysis are not valid. Using OLS when the both series are non-stationary can easily lead to incorrect conclusions, because of the possibility of spurious regression. Because the two series have a stochastic trend, OLS often picks up this apparent correlation.

In stationary time series, shocks will be temporary and over time their effects will be eliminated as the series revert to their long-run mean values. On the other hand, non-stationary time series will necessarily contain permanent components.

A difference stationary series is said to be integrated and is denoted as I(d) where d is the order of integration. The order of integration is the number of unit roots contained in the series, or the number of differencing operations it takes to make the series stationary. A stationary series is I(0); a I(0) series is said to be mean reverting, as there is a tendency in the long-run to return to its mean. Most of the variables are I(1) in level, that is they contain a unit root; in a time series approach, it is necessary to make them stationary by taking the first difference.

Nearly all time-series show permanent growth over time. A test for the order of integration is a test for the number of unit roots. Therefore, time series preliminary analysis involves running unit root tests.

Section 4 – Estimation procedure and results

Before conducting a discussion about the results of econometric estimations, we provide some explanations about the choice of the model. The vector auto-regression (VAR) is one of the macro-econometric tools, commonly used for forecasting systems of interrelated time series and for analysing the dynamic impact of random disturbances on the system of variables. The VAR model is just a multiple time series generalization of the AR model.

Since the publication of Sims' critique of classical economic modelling (1980), VAR processes have become standard tools for macro-econometric analyses. Sim's critique concentrated on the status of exogeneity arbitrarily attributed to some variables: "Existing large models contain too many incredible restrictions … Few variables are truly exogenous, so that endogenous variables are being treated as 'as if' they were exogenous". In the VAR models all variables are treated as a priori endogenous and allowance is made for rich dynamics. Although certain economic models may assert that policy variables are exogenous, there may be feedback effects such that the policy variables are set with specific reference to the state of other variables in the system.

The VAR makes minimal theoretical demands on the structure of the model. With a VAR one needs to specify only the following things: the variables (endogenous and exogenous) that are believed to interact and that hence should be included in the model; and the number of lags needed to capture most of the effects that the variables have on each other.

For purposes of analysing and forecasting macroeconomic activity and tracing the effect of policy changes and external stimuli on the economy, researchers have found that simple VARs have proved as good as or better than structural equation systems. In addition to forecasting, VARs have been used for two primary functions: testing Granger causality and studying impulse response characteristics.

In each estimation, we examine the dynamic relationships among two or three variables. In the general case of three variables, given the set of three time series variables $y_t = (y_{1t}, y_{2t}, y_{3t})'$, the estimated VAR model is of the form:

$$y_t = \begin{pmatrix} y_{1,t} \\ y_{2,t} \\ y_{3,t} \end{pmatrix} = \begin{pmatrix} \alpha_{10} \\ \alpha_{10} \\ \alpha_{20} \end{pmatrix} + \sum_{i=1}^{p} \begin{pmatrix} \alpha_{11,i} & \alpha_{12,i} & \alpha_{13,i} \\ \alpha_{21,i} & \alpha_{22,i} & \alpha_{23,i} \\ \alpha_{31,i} & \alpha_{32,i} & \alpha_{33,i} \end{pmatrix} \begin{pmatrix} y_{1,t-i} \\ y_{2,t-i} \\ y_{3,t-i} \end{pmatrix} + u_t$$

where $(\alpha_{1,0}, \alpha_{2,0}, \alpha_{3,0})'$ is a vector of constants, $u_t = (u_{1t}, u_{2t}, u_{3t})'$ is a vectror of unobservables with zero mean independent white noise process with time invariant positive definite covariance matrix $E(u_t u_t') = \Sigma_u$. In such a way, we relate three endogenous variables (for example GDP growth, investment and employment growth; respectively y_{1t}, y_{2t}, y_{3t}) to each other; each endogenous variable in the system is a function of the lagged values of all the endogenous variables in the system. Therefore, the structure of the system incorporates feedbacks since GDP growth, investment and employment growth are allowed to affect each other. Simultaneity is not an issue and OLS yields consistent estimates because only lagged values of the endogenous variables appear on the right-hand side.

The complicated dynamics of a VAR make direct interpretation of coefficients in the regression equations quite difficult; and there are complicated "cross-equation feedbacks… The best descriptive device appears to be analysis of the system's response to typical

random shocks". [39] Impulse responses are indeed especially useful tools for describing the dynamic behaviour of the system hit by shocks. As the underlying shocks are not likely to occur in isolation, the innovations of the VAR are orthogonsalized using a Cholesky decomposition of the covariance matrix Σ_u. This option imposes an ordering of the variables in the VAR; a shock in the last variable has no instantaneous effect on the other two variables, while a shock in the first two variables might have instantaneous impacts on the last variable. In such a way the first two variables have the greatest possible explanatory power. "Variables that are higher in the ordering are credited with greater explanatory power in the VAR system". [40]

The impulse response functions (IRFs) trace the response of an endogenous variable, (for example employment growth) y_{3t}, to a shock in another endogenous variable, (for example investment) y_{2t}. A shock to one variable not only directly affects the same variable but it is also transmitted to all the other endogenous variables through the dynamic (lag) structure of the VAR. An impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables. By shock (or innovation) to investment we mean a one-standard-deviation increase in investment; [41] investment will move away from its equilibrium and it then returns to it. Plotting the impulse response functions is a very practical way to visually represent the behaviour of the series in response to various shocks.

The forecast error variance decomposition is also a popular tool for interpreting the VAR models. The variance decompositions, such as the impulse response functions, are derived from tracing out the effects of innovations in the vector moving average representation of the VAR process. The variance decomposition illustrates the proportion of the forecast error variance of one variable (for example, employment growth) explained by random innovations; it basically provides information about the relative importance of each innovation in affecting the variables in the VAR. It tells the proportion of movements in a sequence due to its "own" shocks versus shocks to other variables.

Another advantage of the time series analysis is that it can easily deal with the Granger-causality issue (Granger, 1969). [42] Formally, an economic time series y1t is said to Granger-causes another series y2t if

$$E\left[y_{2,t+1}\middle|\Omega_t\right] \neq E\left[y_{2,t+1}\middle|\Omega_t'\right]$$

where Ω_t is the information set containing all available information whilst Ω^t excludes the information in the past and present y_{1t}. This implies that $y_{2,t+1}$ is better forecast if the information in $y_{1,t-j}$ is used than if it is not. For example, GDP growth (y_{1t}) is said to Granger cause employment growth (y_{3t}) if the path of GDP growth contains exploitable information that helps to predict the path of employment growth, beyond the information already predictable from the path of employment growth itself. Granger test is just a statistical test based not on a specific theory of causation but based on the ability of the equation to better predict the dependent variable.

[39] Sims, 1980.

[40] Feasel, Kim and Smith, 2001.

[41] The one-standard-deviation sets the impulses to one standard deviation of the residuals; this option takes into account the units of measurement.

[42] "Investigating Casual Relations by Econometric Models and Cross-Spectral Methods", in *Econometrica*, 37, 3, 424–438.

In this section, as a preliminary data analysis, all data series are first checked for stationarity. If the series are non-stationary, standard econometric techniques can lead to misleading results. For all the series, the hypothesis of a unit root can be rejected at 10 per cent significance level, excluding therefore the possibility of misleading results. For each VAR, we have also checked the stability condition (all the roots should have modulus less than one). Since the roots are outside the unit circle, each VAR presented in this section satisfies the stability condition, and the system is stationary.

The choice of series to be examined was determined by data availability and theoretical backgrounds. From the neoclassical framework, the extent to which the investment series does or does not affect total and formal employment growth was examined, as a way of highlighting and clarifying other critical processes that had been going on in the economy, which ultimately drove the employment outcomes. Because a series on international migration and remittances on quarterly basis could not be obtained, consumption series was examined to capture part of the process related to outmigration and remittance inflows. Because consumption was closely related to imports, employment and investment in relation to import and export series were also examined.

4.1. VAR 1: GDP, investment and consumption

Before analysing employment growth, we present a tri-variate VAR where the three variables are GDP growth, consumption growth and investment growth. In the previous sections we have seen that Moldova has been a case of consumption-driven growth. Figure 24 illustrates the impulse response functions for the response of GDP growth (measured as log difference) associated with one standard-deviation shocks in investment growth and consumption growth.

Each vertical axis measures the percentage deviation of the variable from its long-run value in response to the shock in question. Each horizontal axis measures the number of quarters along which the adjustment to any shock takes place; in each graph in this section we analyse the effect of the shocks for ten quarters, that is two-and-a-half years.

Figure 24. Response to Cholesky one S.D. innovations $\pm$ 2 S.E [43]

(a)   (b)
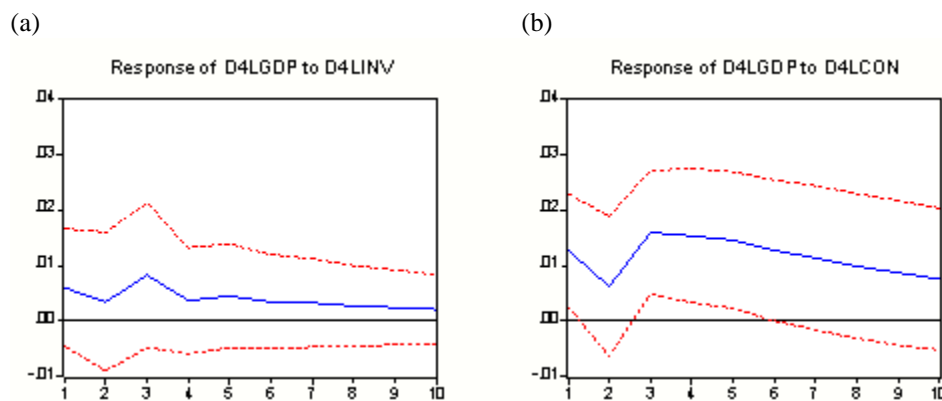
[43] S.E. stands for standard error, D4LGDP is the seasonal difference of the log of GDP, D4LINV is the seasonal difference of the log of investment and D4LCON is the seasonal difference of the log of consumption.

The solid lines represent the point estimates, while the dotted lines denote the standard error bands, which provides information on the statistically significance of the response function.

As evident from the previous figure, based on the data on the Moldovan economy, a shock to investment growth does not have a significant effect on GDP growth, while a positive shock to consumption has a positive effect on GDP growth, and this effect is significant till the fifth period (except in the second period). This graph basically confirms all the findings of the previous section: there is a strong short-run relationship between the growth rate of GDP and consumption, while investment shock has no significant effect on the GDP growth.

We now present in table 20 the forecast error variance decomposition. The variance decomposition confirms that consumption explains a much larger fraction of GDP growth variation than investment. Investment and consumption explain a not-insignificant percentage of the variation of GDP growth (37 per cent in the fourth quarter), with consumption as a principal factor.

Table 20.   Variance decomposition of GDP growth rate (percentage)

Period	Investment	Consumption	GDP
1	3.0	13.5	83.6
4	5.8	30.9	63.4
6	6.0	39.7	54.3

We now concentrate our attention on employment growth and all the potential variables which might affect, predict or contain information about the trend of employment growth. We first analyse employment, economic growth and investment and then we consider export, FDI, and consumption. We estimate VAR using quarterly data. We also present some autoregressive distributed lag (ARDL) (1,1,1) [44] specifications using quarterly data.

4.2. Relationships between macroeconomic series and total employment

In this subsection, the relationship between total employment and macroeconomic series are examined. The relationship between the same series and formal employment is explored in the next subsection.

4.2.1. VAR2a: Employment, economic growth and investment

We first begin by analysing the following variables: total employment, economic growth and total investment. We choose the following ordering: investment, GDP growth and employment growth. An important preliminary step in impulse response analysis is the selection of the VAR lag order. The lag-order selection criteria provided by EViews [45] give

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[44] The term (1,1,1) stands for the number of lags of the dependent variables and of the two regressors.

[45] They are LR (sequential modified LR test statistic), FPE (Final prediction error), AIC (Akaike information criterion), SC (Schwarz information criterion) and HQ (Hannan–Quinn).

the same answer: two-year lag provides the most accurate impulse response estimates. The estimated residuals are also tested for the presence of autocorrelation.

Figure 25 displays the impulse response functions for the response of employment growth associated with one standard-deviation shocks in each of the innovations: GDP and investment. The effects of one-unit shock in GDP growth to employment growth are shown in panel (a) of figure 25. This graph suggests a long-run relationship between the two variables. Looking at the whole pattern of the impulse response an increase of GDP has a positive effect on employment growth with some lags, in particular in corresponding quarter of the second year and of the third year; while for the remaining periods the impulse responses of employment growth to GDP are not significantly different from zero. It should be noted that GDP growth can be caused by many factors; considering this indicator, we cannot disentangle the effects of the components of GDP. GDP includes consumption, investment, export and so on. For a better understanding of the pattern of employment growth we consider the components of GDP in the following VARs.

The effects of one-unit shock in the investment are shown in panel (b) of the figure 25. Impulse response analysis reveals the absence of a statistically significant relationship between investment and employment growth, but in the first quarter. Therefore, a positive shock to investment has an immediate and positive effect on the employment growth, which becomes not statistically significant afterwards. Ultimately, changes in all the variables approach zero as the effects of the shock dampen out.

Figure 25.   Response to Cholesky one S.D. innovations $\pm$ 2 S.E.

(a)   (b)
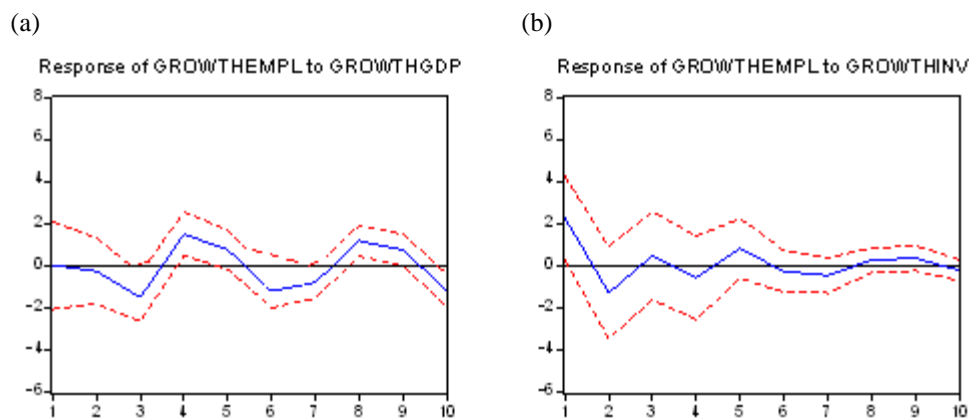
The forecast error variance decomposition is now presented. If the shock to GDP explains none of the forecast error variance of employment at all forecast horizon, then we can say that the series of employment is exogenous. In such a circumstance, the series of employment would evolve independently of the shocks to GDP and to the series of GDP. At the other extreme, shocks to GDP could explain all the forecast error variance in the series of employment at all forecast horizon, so that the series of employment would be entirely endogenous. In applied research, it is typical for a variable to explain almost all of its forecast error variance at short horizons and smaller proportions at longer horizons. The results for this VAR are shown in table 21. As expected, the employment growth rate series explains the preponderance of its own past values. GDP explains a smaller and increasing over time fraction of employment growth variation. In total, more than 32 per cent of the forecast error variance of employment growth can be accounted for by innovations in both GDP and investment. On one hand there is an unexplained variation in employment growth, but on the other GDP and investment have a considerable effect on the employment growth, compared to the standard results in the literature of forecast error variance decomposition. Not surprisingly, the greatest the forecast horizon, the larger the proportion of forecast variance that will be due to the other variables.

Table 21.   **Variance decomposition of employment growth rate** (percentage)

Period	GDP	Investment	Employment
1	0.0	16.3	83.8
4	10.2	16.1	73.6
6	13.9	16.8	69.4

Given the initial order, where y_{1t} is GDP growth, y_{2t} is investment and y_{3t} is employment growth, the Granger causality test involves in the trivariate pth order VAR the following null hypotheses:

− $\alpha_{31,i} = 0$, if GDP does not Granger cause employment growth;

− $\alpha_{32,i} = 0$, if investment does not Granger cause employment growth;

− $\alpha_{13,i} = 0$, if employment growth does not Granger cause GDP;

− $\alpha_{23,i} = 0$, if employment growth does not Granger cause investment.

The results are summarized in table 22.

Table 22.   **Causality tests**

Null hypothesis	p-value
$\alpha_{31,i} = 0$	0.03
$\alpha_{32,i} = 0$	0.86
$\alpha_{13,i} = 0$	0.58
$\alpha_{23,i} = 0$	0.63

According to these results, GDP growth Granger-causes employment growth rate. At the same time, employment growth does not Granger-cause GDP growth. Therefore, in this case, there is no evidence of reverse causation of both macroeconomic indicators. Changes in employment growth rate do not explain movements in investment and vice versa. Using these variables, there is unidirectional causality between employment and GDP. This result suggests the importance of GDP in explaining employment growth.

4.2.2. VAR3a: Employment, investment and export

We now analyse the relationship between total employment, investment and export. We choose the following ordering: investment, export and employment growth. We use growth rates of each variables and they are I(0). According to the lag-order selection criteria provided by Eviews, two-year lag provides the most accurate impulse response estimates.

Figure 26 shows the impulse response functions for the response of employment growth associated with one standard-deviation shocks in each of the innovations: investment and export. The effects of one-unit shock in investment to employment growth are shown in panel (a) of figure 26. This graph suggests that a shock to investment has a positive and significant effect on employment growth at annual level (at the first and fourth quarter). In other quarters, the impulse responses are statistically insignificant.

The effects of one-unit shock in export are shown in panel (b) of the figure. Impulse response analysis reveals the absence of a statistically significant relationship between export and employment growth, but in the fourth quarter. One year after a one-unit shock in export data reveals that this shock has a positive impact on employment growth. This result can be explained by the fact that according to labour economics, exports, being a source of demand, increase employment (e.g. Borjas et al., 1992; Wood, 1994). According to the literature, trade not only shifts the labour demand but also potentially brings international competitive pressure, which may lead to trade-induced technological change or efficiency gains. However, the positive effect of the shock to export is only temporary; there is a year lag before the benefits of a shock in export become apparent, but they then immediately disappear.

Figure 26.   Response to Cholesky one S.D. innovations $\pm$ 2 S.E.
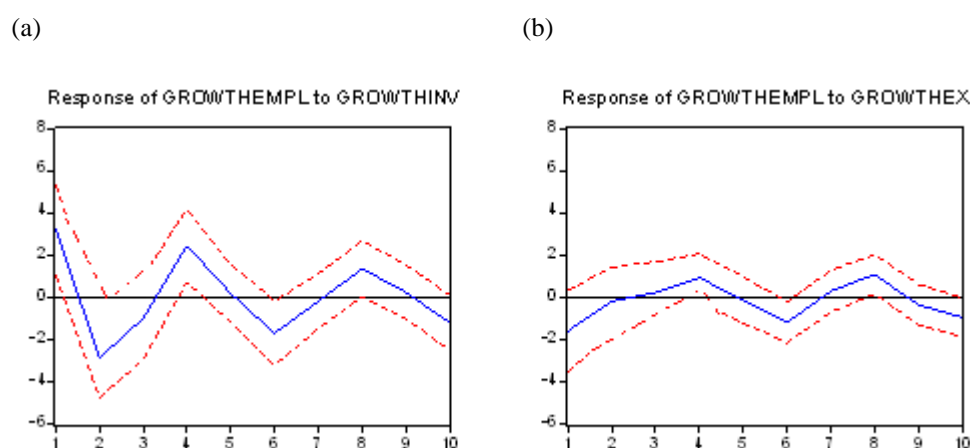
(a)   (b)

The variance decomposition illustrates the proportion of the forecast error variance of employment growth rate explained by the random innovations; the results are shown in table 23.

As expected, the employment growth rate series explains much of its own past values; but this table provides even better results than the previous one. Innovations in the investment explain an increasing percentage of the forecast error variance of employment, while innovations in export explain about 6 per cent of the four-year forecast error variance. Investment explains a large fraction of employment growth variation. In total, more than 49 per cent of the forecast error variance of employment growth can be accounted for by innovations in both investment and export.

Table 23.   Variance decomposition of employment growth rate (percentage)

Period	Investment	Export	Employment
1	26.8	6.7	66.6
4	43.4	6.0	50.6
6	44.6	7.7	47.6

Given the initial order, where y_{1t} is investment, y_{2t} is export and y_{3t} is employment, the Granger causality test involves in the trivariate pth order VAR the following null hypotheses:

– $a_{31,i} = 0$, if investment does not Granger cause employment growth;

– $\alpha_{32,i} = 0$, if export does not Granger cause employment growth;

- $\alpha_{13,i} = 0$, if employment growth does not Granger cause investment;

- $\alpha_{23,i} = 0$, if employment growth does not Granger cause export.

The results are summarized in table 24.

Table 24. **Causality tests**

Null hypothesis	p-value
$\alpha_{31,i} = 0$	0.05
$\alpha_{32,i} = 0$	0.42
$\alpha_{13,i} = 0$	0.25
$\alpha_{23,i} = 0$	0.74

When we consider these two single components of GDP, it results that investment Granger-causes the employment growth rate. At the same time, employment growth does not Granger-causes investment; therefore there is evidence of no reverse causation. Changes in employment growth rate do not explain movements in exports and vice versa. For these variables, there exists unidirectional causality between employment growth and investment.

4.2.3. VAR4a: Employment, investment and consumption

In this subsection we consider the main components of GDP, investment and consumption and their effect on employment growth. Panel (a) of figure 27 shows the effects of a positive shock in consumption to employment growth. This graph suggests that the relationship between employment and consumption is negative and significant in the first period and becomes insignificant afterwards. This is not surprising because, according to the Moldovan data, there is a very short-run relationship between employment and consumption and the increase in consumption from 2000 onwards has been accompanied by a decrease in employment.

The effects of one-unit shock in investment are shown in panel (b) of the figure. Impulse response analysis reveals the presence of a statistically significant relationship between investment and employment growth only in the first quarter. A shock to investment has a positive and immediate effect on employment growth; in the following quarters, impulse responses are statistically insignificant. These results confirm what has been presented in the previous subsections.

Therefore, both a shock to consumption and a shock to investment affect employment growth, but in opposite way: in the first case, employment growth decreases while in the other increases. However, these effects are temporary, and disappear within a year.

Figure 27. **Response to Cholesky one S.D. innovations ± 2 S.E.**
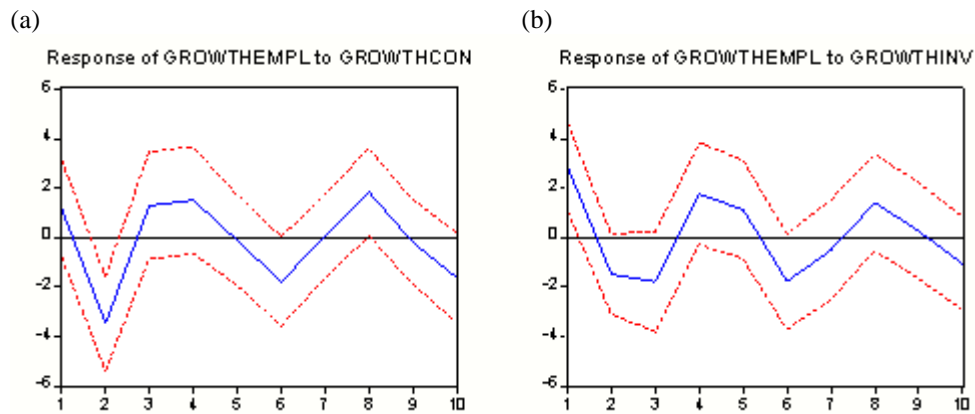
(a)   (b)

The variance decomposition illustrates the proportion of the forecast error variance of employment growth rate explained by the random innovations; the results are shown in table 25.

As expected, the employment growth rate series explains the majority of its own past values; but this table provides the best results compared to the previous ones. Innovations in the investment explain an increasing percentage of the forecast error variance of employment reaching the value of 30 per cent in the sixth quarter; innovations in consumption explain a slightly lower (and increasing) percentage, almost 30 per cent of the six-year forecast error variance. In total, 60 per cent of the forecast error variance of employment growth can be accounted for by innovations in both investment and export. On the whole, there is a large explained variation in employment growth when considering consumption and investment.

Table 25. **Variance decomposition of employment growth rate** (percentage)

Period	Consumption	Investment	Employment
1	4.7	28.4	66.9
4	29.9	28.8	41.3
6	29.5	30.4	40.1

Given the initial order, where y_{1t} is consumption, y_{2t} is investment and y_{3t} is employment, the Granger causality test involves in the trivariate pth order VAR the following null hypotheses:

- $a_{31,i} = 0$, if consumption does not Granger cause employment growth;

- $\alpha_{32,i} = 0$, if investment does not Granger cause employment growth;

- $\alpha_{13,i} = 0$, if employment growth does not Granger cause consumption;

- $\alpha_{23,i} = 0$, if employment growth does not Granger cause investment.

The results are summarized in table 26.

Table 26.	Causality tests

Null hypothesis	p-value
$\alpha_{31,i} = 0$	0.01
$\alpha_{32,i} = 0$	0.02
$\alpha_{13,i} = 0$	0.00
$\alpha_{23,i} = 0$	0.04

Investment Granger-causes the employment growth rate and vice versa. At the same time, consumption Granger-causes employment growth and changes in employment growth rate explain movements in consumption. In this case bidirectional causality hold for every variable, that is employment growth, consumption and investment are clearly endogenous variables jointly determined.

4.2.4. VAR5a: Employment and FDI

We now analyse the relationship between employment growth and FDI, using a bi-variate VAR. According to the theory illustrated in section 2, FDI have a role of employment generators.

Figure 28 shows the effects of a positive shock in FDI to employment growth. This graph suggests that the relationship between employment growth and FDI is positive and significant in the first period and becomes insignificant afterwards. Therefore, there is a very short-run relationship between employment growth and FDI. The role of FDI as employment generator is confirmed in Moldova, but only in the short-run.

Figure 28. **Response to Cholesky one S.D. innovations $\pm$ 2 S.E.**

Response of GROWTHEMPL to GROWTHFDI
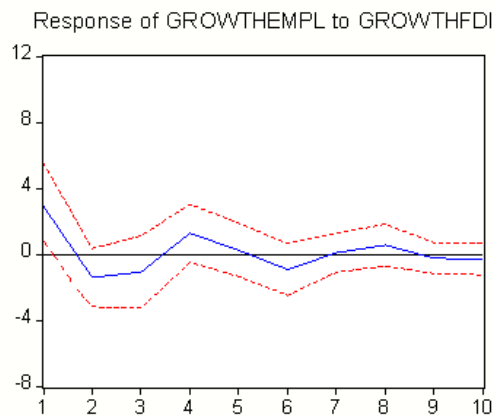
The variance decomposition is shown in table 27. As expected, the employment growth rate series explains the majority of its own past values; innovations in the FDI explain a positive percentage of the forecast error variance of employment, of about 15 per cent. On the whole, there is an unexplained variation in employment growth, but, compared to the other tables, here we are considering only one variable.

Table 27. **Variance decomposition of employment growth rate** (percentage)

Period	FDI	Employment
1	15.7	84.3
4	15.9	84.1
6	15.4	84.6

Given the initial order, where FDI y_{1t} is and employment is y_{2t}, the Granger causality test involves in the bivariate pth order VAR the following null hypotheses:

– $a_{21,i} = 0$, if FDI does not Granger cause employment growth;

– $\alpha_{12,i} = 0$, if employment growth does not Granger cause FDI;

The results are summarized in table 28.

Table 28. Causality tests

Null hypothesis	p-value
$\alpha_{21,i} = 0$	0.61
$\alpha_{12,i} = 0$	0.69

Changes in employment growth rate do not help to predict movements in FDI and vice versa. For these variables, there is no causality between employment growth and FDI.

4.3. Relationships between macroeconomic series and formal employment

In this subsection we replicate the analysis of the previous subsections, but data on formal employment, instead of total employment, are used. The aim of this analysis consists in giving an indication on how formal employment is affected by shocks to macroeconomic variables (such as GDP, investment, exports and FDI).

Quarterly data on formal/informal employment has been collected since the first quarter of 2003; given the availability of the other series, the following VAR are estimated with quarterly data from 2003Q1 to 2007Q4. The relatively paucity of the data implies that the results should be interpreted cautiously.

4.3.1. VAR 2b: Formal employment, GDP and investment

We first begin by analysing the following variables: formal employment, economic growth and total investment. We choose the following ordering: GDP growth, investment and formal employment growth. The estimated residuals are also tested for the presence of autocorrelation.

Figure 29 displays the impulse response functions for the response of formal employment growth associated with one standard-deviation shocks in each of the innovations: GDP and investment.

The effects of one-unit shock in GDP growth to formal employment growth are shown in panel (a) of figure 29. This graph suggests a long-run relationship between the two variables. Looking at the whole pattern of the impulse response, an increase of GDP has a positive effect on employment growth at a regular frequency: in the first quarter after shock and in first quarter of the subsequent year. While for the remaining periods the impulse responses of employment growth to GDP are not significantly different from zero.

The effects of one-unit shock in the investment are shown in panel (b) of figure 29. Impulse response analysis reveals the absence of a statistically significant relationship between investment and formal employment growth, but in the first quarter. Therefore, a positive shock to investment has an immediate and positive effect on the formal

employment growth. And the positive effect of the shock to investment is only temporary, because it then disappears. Regarding the shock to investment, we have obtained the same result of section 4.2, where total employment has been examined.

Figure 29. **Response to Cholesky one S.D. innovations $\pm$ 2 S.E.**

(a)

Response of GROWTHFORMAL to GGDP

(b)

Response of GROWTHFORMAL to GINV
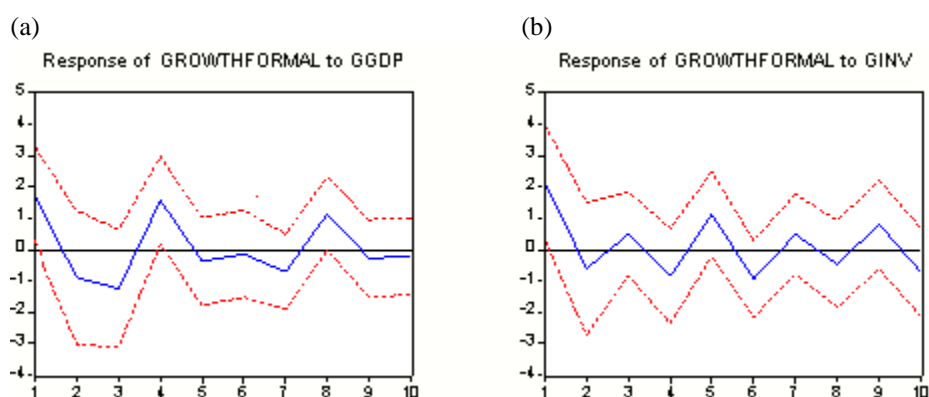
The forecast error variance decomposition is now presented. The results for this VAR are shown in table 29. GDP explains an increasing percentage of formal employment growth variation. In total, the majority of the forecast error variance of employment growth can be accounted for by innovations in both GDP and investment, both in period 4 (58 per cent) and in period 6 (62 per cent). Therefore, there is a small unexplained variation in formal employment growth, because GDP and investment have a considerable effect on the formal employment growth, compared to the standard results in the literature about forecast error variance decomposition. Not surprisingly, the greatest the forecast horizon, the larger the proportion of forecast variance that will be due to the other variables.

Table 29. **Variance decomposition of formal employment growth rate** (percentage)

Period	GDP	Investment	Formal employment
1	28.2	16.7	55.1
4	37.1	21.3	41.6
6	34.1	27.7	38.2

Given the initial order, where y_{1t} is GDP growth, y_{2t} is investment and y_{3t} is formal employment growth, the Granger causality test involves in the trivariate pth order VAR the following null hypotheses:

- $a_{31,i} = 0$, if GDP does not Granger cause formal employment growth;

- $\alpha_{32,i} = 0$, if investment does not Granger cause formal employment growth;

- $\alpha_{13,i} = 0$, if formal employment growth does not Granger cause GDP;

- $\alpha_{23,i} = 0$, if formal employment growth does not Granger cause investment.

The results are summarized in table 30.

Table 30.   Causality tests

Null hypothesis	p-value
$\alpha_{31,i} = 0$	0.16
$\alpha_{32,i} = 0$	0.29
$\alpha_{13,i} = 0$	0.23
$\alpha_{23,i} = 0$	0.30

According to these results, changes in formal employment growth rate do not explain movements in GDP and vice versa. The same rationale applies for formal employment and investment. For these variables, there is no unidirectional or bidirectional causality in the Granger sense.

4.3.2. VAR 3b: Formal employment, investment and export

We now analyse the relationship between formal employment, investment and export. The ordering is the following: investment, export and formal employment growth.

Figure 30 shows the impulse response functions for the response of formal employment growth associated with one standard-deviation shocks in each of the innovations, investment and export.

The effects of one-unit shock in investment to formal employment growth are shown in panel (a) of figure 30. This graph suggests that a shock to investment has a positive and significant effect on formal employment growth in the first quarter after the shock, and it has a negative impact in the second quarter. This result might suggest that the relationship between growth of formal employment and investment is not robust. In the other quarters, impulse responses are statistically insignificant.

The effects of one-unit shock in export are shown in panel (b) of the figure. Impulse response analysis reveals the absence of a statistically significant relationship between export and growth of formal employment.

Figure 30.   Response to Cholesky one S.D. innovations $\pm$ 2 S.E.
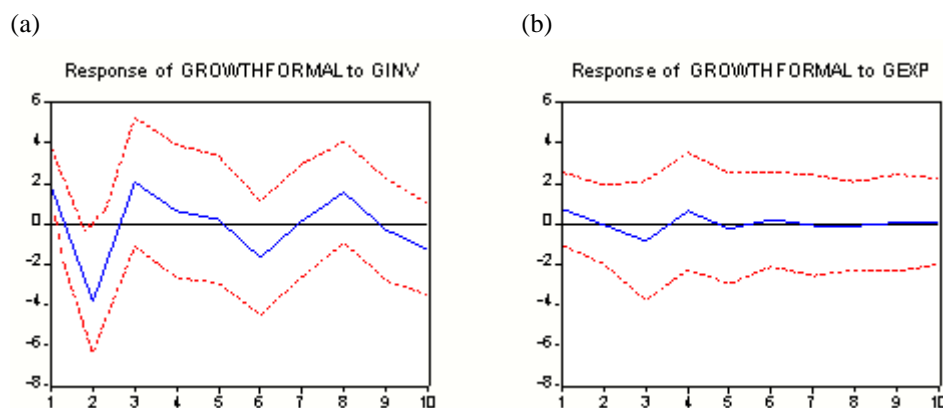
(a)

(b)

The variance decomposition illustrates the proportion of the forecast error variance of formal employment growth rate explained by the random innovations; the results are shown in table 31.

As expected, the formal employment growth rate series explains much of its own past values. Innovations in the investment explain an increasing percentage of the forecast error variance of employment, while innovations in export explain about 3 per cent of the forecast error variance. Investment explains a large fraction of formal employment growth variation. In total, about 50 per cent of the forecast error variance of formal employment growth can be accounted for by innovations in both investment and export.

Table 31. **Variance decomposition of formal employment growth rate** (percentage)

Period	Investment	Export	Formal employment
1	19.0	3.1	77.9
4	49.7	3.6	46.7
6	45.4	3.1	51.5

Given the initial order, where y_{1t} is investment, y_{2t} is export and y_{3t} is formal employment, the Granger causality test involves in the trivariate pth order VAR the following null hypotheses:

− $a_{31,i} = 0$, if investment does not Granger cause formal employment growth;

− $\alpha_{32,i} = 0$, if export does not Granger cause formal employment growth;

− $\alpha_{13,i} = 0$, if formal employment growth does not Granger cause investment;

− $\alpha_{23,i} = 0$, if formal employment growth does not Granger cause export.

The results are summarized in table 32.

Table 32. **Causality tests**

Null hypothesis	p-value
$\alpha_{31,i} = 0$	0.00
$\alpha_{32,i} = 0$	0.26
$\alpha_{13,i} = 0$	0.01
$\alpha_{23,i} = 0$	0.39

When we consider these two single components of GDP, it results that investment Granger-causes the formal employment growth rate. At the same time, formal employment growth Granger-causes investment; therefore there is evidence of bidirectional causality between formal employment and investment. Changes in formal employment growth rate do not explain movements in exports and vice versa.

4.3.3. VAR 4b: Formal employment, investment and consumption

In this subsection we consider the main components of GDP, investment and consumption and their effect on formal employment growth. Panel (a) of figure 31 shows the effects of a positive shock in consumption to formal employment growth. This graph suggests that the relationship between employment and consumption is negative and significant in the second and in the sixth quarter after the shock, and not statistically significant in the other periods. This is not surprising, because theoretically speaking the increase in consumption is not a determinant of formal employment growth. This result is similar to the one in section 4.4, where total employment has been analysed.

The effects of one-unit shock in investment are shown in panel (b) of the figure. Impulse response analysis reveals the absence of a statistically significant relationship between investment and formal employment growth. This result confirms the previous findings concerning the relationship between growth of formal employment and investment: an increase in investment does not necessarily imply an increase in formal employment, according to the data available.

Figure 31. Response to Cholesky one S.D. innovations $\pm$ 2 S.E.
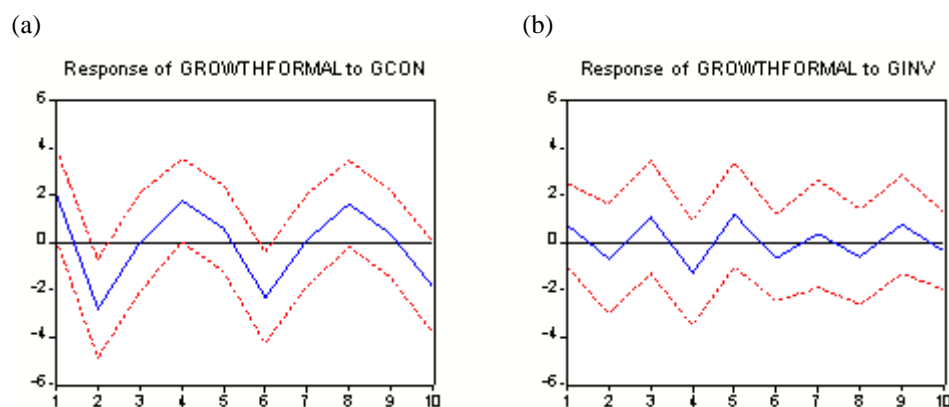
(a)   (b)

The variance decomposition illustrates the proportion of the forecast error variance of formal employment growth rate explained by the random innovations; the results are shown in table 33.

Innovations in consumption explain an increasing percentage of the forecast error variance of employment reaching the value of 48.8 per cent in the sixth quarter; innovations in investment explain a slightly lower (and increasing) percentage, about 13 per cent of the six-year forecast error variance. In total, 60 per cent of the forecast error variance of formal employment growth can be accounted for by innovations in both investment and consumption.

Table 33. Variance decomposition of formal employment growth rate (percentage)

Period	Consumption	Investment	Formal employment
1	24.4	3.1	72.5
4	45.1	11.4	43.5
6	48.8	13.1	38.1

Given the initial order, where y_{1t} is consumption, y_{2t} is investment and y_{3t} is formal employment, the Granger causality test involves in the trivariate pth order VAR the following null hypotheses:

− $a_{31,i} = 0$, if consumption does not Granger cause formal employment growth;

− $\alpha_{32,i} = 0$, if investment does not Granger cause formal employment growth;

− $\alpha_{13,i} = 0$, if formal employment growth does not Granger cause consumption;

− $\alpha_{23,i} = 0$, if formal employment growth does not Granger cause investment.

The results are summarized in table 34.

Table 34.   Causality tests

Null hypothesis	p-value
$\alpha_{31,i} = 0$	0.27
$\alpha_{32,i} = 0$	0.23
$\alpha_{13,i} = 0$	0.55
$\alpha_{23,i} = 0$	0.41

According to table 34, changes in formal employment growth rate do not explain movements in investment and vice versa. The same rationale applies for formal employment and consumption. For these variables, there is no unidirectional or bidirectional causality in the Granger sense.

4.3.4. VAR 5b: Formal employment and FDI

We now analyse the relationship between growth of formal employment and FDI, using a bi-variate VAR. According to the theory illustrated in section 2, FDI have a role of employment generators.

Figure 32 shows the effects of a positive shock in FDI to formal employment growth. This graph suggests that the relationship between employment growth and FDI is not statistically significant for the whole period. While the role of FDI as employment generator is confirmed in Moldova only in the short-run, we do not find the same result for formal employment.

Figure 32.   Response to Cholesky one S.D. innovations $\pm$ 2 S.E.
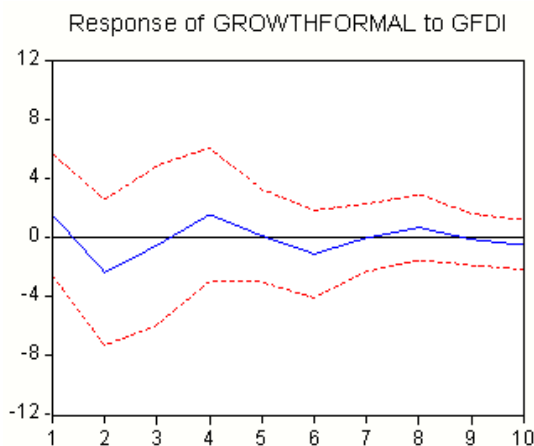
The variance decomposition is shown in table 35. As expected, the formal employment growth rate series explains the majority of its own past values; innovations in the FDI explain a positive percentage of the forecast error variance of employment, of about 11 per cent. On the whole, there is a large explained variation in formal employment growth when considering FDI.

Table 35. **Variance decomposition of formal employment growth rate** (percentage)

Period	FDI	Formal employment
1	4.4	95.6
4	11.9	88.1
6	11.7	88.3

Given the initial order, where FDI y_{1t} is and employment is y_{2t}, the Granger causality test involves in the bivariate pth order VAR the following null hypotheses:

− $a_{21,i} = 0$, if FDI does not Granger cause formal employment growth;

− $\alpha_{12,i} = 0$, if formal employment growth does not Granger cause FDI;

The results are summarized in table 36.

Table 36. **Causality tests**

Null hypothesis	p-value
$\alpha_{21,i} = 0$	0.92
$\alpha_{12,i} = 0$	0.68

Changes in formal employment growth rate do not help to predict movements in FDI and vice versa. For these variables, there is no causality in the Granger sense between formal employment growth and FDI.

The VAR analysis has shown that investment, exports and FDI have no effects on the growth rate of formal employment. With a larger dataset it is very likely that a stable relationship between investment and formal employment would emerge.

The correlation coefficient between formal employment and investment is positive but quite low (equal to 0.13), while the correlation coefficient between formal employment and FDI is zero, indicating the absence of any linear dependency between two variables.

The correlation coefficient between formal employment and export is even negative, equal to -0.27. Ghosh and Paul (2008) have found empirical evidence of rising informality with openness in 18 Central Eastern European (CEE) and Former Soviet Union (FSU) countries.

Formal employment is likely to be strongly affected by policy interventions and institutional variables. For example, Saracoğlu (2008) has shown in a dynamic general equilibrium framework that a country can successfully reduce its informal employment by reducing tax on employment in the formal sector. However, due to the lack of these data we cannot empirically verify the effects of these policy variables on the growth of formal employment.

4.4. Single equation regressions

In this subsection we present single regression analysis. We should take into account that the variables under study are endogenous, and this consideration imposes caution about the results we obtain. Notwithstanding, simple regression analysis provides some useful insights.

In table 37 the estimated employment growth equation follows an autoregressive distributed lag (ARDL) (1,1,1) [46] specification, where the regressors are investment and import (in terms of growth rates, which are stationary). The lag length has been chosen according to the Akaike Information Criterion (AIC). [47] As expected, the contemporaneous coefficient on investment is positive and statistically significant, indicating a positive relationship between employment growth and investment growth; the lagged coefficient is no statistically significant. The contemporaneous coefficient on import is not statistically significant, while the lagged one is significant and negative; imports, being a reduction in labour demand, decrease employment. This result is not surprising at all because we have already analysed in section 2 the relationship between consumption and imports; figure 17 shows that the great percentage of consumption is directed to imports. The VAR4 shows that consumption has a significant and lagged effect on employment growth. And therefore the fact that imports have a negative and lagged effect on employment is an obvious outcome.

Table 37. **Dependent variable: employment growth** (regression 1)

Dependent Variable: GROWTHEMPL (Employment Growth)

Sample (adjusted): 1999Q3 2006Q4

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t–Statistic	Prob.
C	0.670	1.221	0.549	0.588
GROWTHEMPL(–1)	–0.247	0.175	–1.413	0.171
GROWTHINV	0.123	0.034	3.642	0.001
GROWTHINV(–1)	–0.051	0.037	–1.372	0.183
GROWTHIMP	–0.086	0.097	–0.880	0.388
GROWTHIMP(–1)	–0.226	0.084	–2.677	0.013
R–squared	0.727	Mean dependent var		–0.234
Adjusted R–squared	0.670	S.D. dependent var		8.951
S.E. of regression	5.141	Akaike info criterion		6.289
Sum squared resid	634.32	Schwarz criterion		6.569
Log likelihood	–88.34	F–statistic		12.78
Durbin–Watson stat	2.354	Prob(F–statistic)		0.000004

In table 38 the estimated employment growth equation follows an autoregressive distributed lag (ARDL) (2,1,1,1) specification, where the regressors are investment, consumption and FDI (again, in terms of growth rates, which are stationary). The lag length has been chosen according to the AIC criterion. In this case the dependent variable is growth rate of workers with higher education. The coefficients on investment and FDI are positive and statistically significant; in particular, investment has a positive and significant contemporaneous effect on the dependent variable while FDI has a positive and significant lagged effect on the growth rate of workers with higher education. The coefficient on consumption in negative and not statistically significant.

[46] The term (1,1,1) stands for the number of lags of the dependent variables and of the two regressors.

[47] The Akaike Information Criterion (AIC) is often used in model selection for non-nested alternatives; smaller values of the AIC are preferred.

Table 38.   Dependent variable: Growth in employment with higher education (regression 2)

Dependent Variable: GROWTHHIG (Growth of Higher Education)

Sample (adjusted): 1999Q4 2006Q4

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t–Statistic	Prob.
C	1.106	0.999	1.107	0.282
GROWTHHIG(–1)	0.073	0.213	0.341	0.736
GROWTHHIG(–2)	–0.433	0.247	–1.755	0.095
GROWTHINV	0.068	0.035	1.977	0.062
GROWTHINV(–1)	0.024	0.030	0.792	0.438
GROWTHCON	–0.056	0.074	–0.750	0.462
GROWTHCON(–1)	–0.002	0.067	–0.030	0.976
GROWTHFDI	0.002	0.010	0.253	0.803
GROWTHFDI(–1)	0.009	0.005	1.856	0.078
R–squared	0.518	Mean dependent var		1.546
Adjusted R–squared	0.325	S.D. dependent var		4.725
S.E. of regression	3.883	Akaike info criterion		5.800
Sum squared resid	301.55	Schwarz criterion		6.225
Log likelihood	–75.10	F–statistic		2.68
Durbin–Watson stat	1.915	Prob(F–statistic)		0.035

Section 5 – Conclusions and policy implications

Moldova is a case of consumption driven growth, where the abundant inflows of workers' remittances have fuelled consumption. But it is unreasonable to expect that these flows will continue to grow at the same rate. Furthermore, the inflows of remittances are uncertain: if the economic conditions in the Russian Federation and the EU, the two main destinations countries, worsen, or enforcement of immigration and labour laws in those countries tightened, the remittances may slow down. This is very likely given the global financial crisis.

In light of theoretical literature presented in section 2, it is unreasonable to expect that these flows will determine long-run growth. According to the main literature, structural factors, such as investment, sustain long-term growth: Moldova should build the foundation for this future growth on more solid base, such as higher investment in physical and human capital. Achieving this requires a more developed financial sector, and a more transparent business environment which attracts FDI. Environment that sustains growth would promote employment growth.

The empirical analysis has examined the factors which can affect employment growth; the results of this analysis can be briefly summarized as follows.

(1) GDP growth has a positive and lagged effect on employment growth: (VAR2a). However, it should be noted that GDP growth can be caused by many factors; considering this indicator, we cannot disentangle the effects of the components of GDP. GDP includes consumption, investment, exports and so on. For a better understanding of the pattern of employment growth we have presented estimates which consider the components of GDP in the VARs and in the ARDL specifications.

(2) Investment has a positive and transitory effect on employment growth (VAR2a, VAR3a and VAR4a and the two ARDL specifications). This result is strong and robust to model specifications.

(3) Exports have a positive, temporary and lagged effect on employment growth (VAR3a and regression 2).

(4) FDI has a positive effect on employment growth (VAR5a). The relationship is transitory, but this result robust to model specifications. According to the ARDL regression 2, also the growth of workers with higher education is positively affected by FDI.

(5) The relationship between consumption and employment growth is negative and transitory (VAR4a and regression 1). Our empirical results suggest that a positive shock to consumption reduces employment growth and, indeed, Moldova has been characterized by positive shocks in consumption (fuelled by migrant's remittances) and decrease in domestic employment.

(6) The relationship between import and employment growth is negative (regression 1). This result is strictly linked with the previous one: imports, being a reduction in labour demand, decrease employment. And consumption has been dependent to a great extend on imported goods (between 75 and 84 per cent in the period 1996–2007).

(7) None of the previous variables has a permanent effect on employment growth; the previous variables are found to have only a transitory effect on employment growth.

(8)	With regard to causality, GDP growth and investment growth causes employment growth in the Granger sense (VAR2a and VAR3a). Therefore, investment and GDP growth help to predict the path employment growth, beyond the information already predictable on the basis of the path of employment growth itself.

The main results of the empirical analysis on formal employment are the following:

(i)	GDP growth has a positive and lagged effect on formal employment growth (VAR 2b);

(ii)	Consumption has the opposite effect: the relationship between consumption and employment growth is negative (VAR 4b);

(iii)	The previous variables have only a transitory effect on the growth rate of formal employment.

The empirical results presented for formal employment are preliminary, since due to data constraints, the time series used was shorter.

The effects of the financial crisis

The financial crisis that started in the US has had big repercussions in the real economy all over the world. The US recession has been officially declared by the National Bureau of Economic Research; according to the Committee, the US economy started to contract in December 2007. US economic indicators have plummeted not just in the financial sector but in manufacturing as well. The financial crisis deepened and broadened in autumn 2008 with the banking sector at the eye of the storm. Important policy measures have been undertaken by governments in both the US and the EU as well as by central banks to restore financial stability. Nonetheless, the EU and euro-area economies cannot escape the negative effects of the financial distress. In January 2009 the IMF has again revised growth forecasts, with advanced economies expected to experience a decline of GDP in 2009. Similar dramatic slowdowns are expected for most emerging and developing countries.

According to the European Commission, Directorate-General for Economic and Financial Affairs (interim forecast, January 2009), the downturn is broad-based, with negative spillovers progressively affecting emerging market economies through a sharp reduction of trade and of private capital inflows. Decisive policy actions have been taken in order to avoid a big recession in the EU; the 'European Economic Recovery Plan' intends to limit the effects of the financial crisis on the real economy via a comprehensive package of policy interventions, among which a substantial budgetary stimulus corresponding to 1.5 per cent of EU GDP.

All the components of GDP are expected to put a drag on GDP growth, but government consumption and public investment. According to the EC forecast, private investment, in particular, is severely influenced by the crisis; concerning financing conditions, the borrowing costs for enterprises and households are likely to be higher. The ECB's bank lending survey suggests a marked tightening of credit conditions; according to survey data (EC), large firms are more heavily affected than Small and Medium Enterprises, and the tightening is more pronounced for enterprises than for households. In this environment, raising new capital (a fundamental cause of growth) is increasingly difficult. This contraction has a great negative impact on growth, being investment one of the main drivers of economic growth. Growth can be stronger than expected if policy interventions would restore confidence among investors and consumers.

The slowdown has started to affect the labour market as well. As ILO noted, what began as a crisis in finance markets has rapidly become a global jobs crisis. The US jobless rate rose to 7.2 per cent in December 2008, the highest in 16 years; according to official data, more US workers lost jobs last year than in any year since the Second World War In Europe, employment growth has eased gradually to 0.2 per cent quarter-on-quarter in the second quarter of this year in both the EU and the euro area. In the third quarter of 2008 employment in the euro area decreased by 0.1 per cent from the previous quarter. Looking ahead, the labour market situation is expected to deteriorate sharply next year because companies are likely to react to reduced demand and tighter financing conditions. [48] Estonia, Ireland, Latvia and Spain have recorded the highest increases in unemployment rates so far, due to the severe housing market downturns. According to EC, the pace of decline is expected to slow in 2010; and unemployment rate is forecast to increase by almost 3 percentage points from early 2008.

Most domestic and foreign-owned banks remain susceptible to the broader loss of confidence and liquidity that has swept through financial markets and that may put solvency at risk. The crisis has already had a negative effect on access to foreign capital markets.

The full impact of the financial turmoil will depend on the behaviour of parent banks and foreign direct investment in the coming year. In central Eastern Europe and the Baltic States and south-eastern Europe, where foreign banks dominate, support from foreign parent banks is likely to be reduced as their balance sheets and capital adequacy are tested by the market. In the Commonwealth of Independent States and Mongolia, some countries already face international capital markets that are closed or greatly restricted.

The IMF has recommended a combination of measures to get the "world back on track", such as

– actions already taken by many governments to stabilize financial markets and get credit flowing again;

– fiscal stimulus through a combination of increased government spending and tax cuts to revive consumer demand;

– liquidity support for emerging market countries to reduce the adverse effects of the widespread capital outflows triggered by the financial crisis; and

– help for low-income countries harmed by fallout from the crisis and the lingering impact of last year's spike in food and fuel prices.

The global crisis is going to spread to the transition economies, which rely heavily on trade, FDI and, some of them, in remittances. Being a typical small open economy, Moldova is going to be affected by the financial turmoil. Moldova is a case of consumption driven growth, where the abundant inflows of workers' remittances have fuelled consumption. But, of course, these flows will not continue to grow at the same rate. The inflows of remittances are likely to slow down because the economic conditions in the Russian Federation and the EU, the two main destinations countries, are worsening.

[48] In January 2009 a Swedish company, facing a reduction in demand for its products and services, is cutting 1,000 jobs worldwide to save money. The firm said that demand for its products and services was falling, particularly in Eastern Europe and Asia, because of the economic downturn. This is just one of the many cases of jobs cuttings that we read every day in newspapers in the early months of 2009.

Moreover, in 2007 exports to the EU countries accounted for 50.6 per cent of total exports in Moldova. The recession in the euro area is likely to decrease this share of exports, with negative consequences for the Moldovan economy. And due to the general reduction of investment, FDI are also likely to diminish. Driven by lower external and domestic demand, growth of both exports and imports is expected to decelerate markedly. The slower growth is also expected to worsen conditions in the informal economy; massive financial support is needed to avoid the deterioration of Moldovan economic conditions.

In the light of the analysis developed in the present work, the following main policy interventions are strongly suggested:

– *Structural reforms* aimed at advancing the transition process and improving the competitiveness of the economy, such as public administration reforms.

– The *restructuring of the financial sector*; it can help local enterprises to obtain access to credit, in particular in this time of global financial crisis. Improve the access of small firms to credit by modifying the legal framework and encouraging the development of financial instruments for sharing and reducing price and quantity risk such as forward and future markets. Venture capital plays an important role for financing structural change, new forms and innovation and, therefore, possibly also for employment growth. But in order to spur venture capital in Moldova, financial market should be characterised by a highly developed stock market.

– *Investment subsidies*, even when temporary, which can boost capital accumulation and have a sizeable impact. The empirical analysis has shown that an increase in investment has a positive effect on employment growth; this result is robust to model specifications and it is consistent with the theoretical literature. Equally important for improving employment, incomes and wages is the implementation of an environment for private investment, the support of small and medium scale business and the development of the private sector as a whole. The country must create a favourable environment for local and foreign investors to generate employment. The conflict in Transnistria, until completely resolved, not only will be a threat to Moldova's national security, but also will increase the risk premium demanded by foreign investors. It is important to ensure that investors have confidence in the country's institutions. In the long and medium term perspective investment and small business promotion are the best solutions to unemployment. The policy makers should support this process of capital accumulation also by increasing public investment; due to the lack of data, we could not test the impact on public investment on employment growth in Moldova, but an employment strategy implies the increase of investment, both private and public.

– Moldova should *attract FDI* given the positive effects they have on employment growth. However, a number of factors influence FDI: the policy framework, the business climate, the quality of governance and the level of corruption. The policy framework should ensure high level of openness and economic liberalization, reduced level of corruption, developed physical and social infrastructure and a good human capital. This virtuous combination of factors determines not only the investment attractiveness of a country, but also the capacity of the economy to absorb capital.

– *Improve the competitiveness* of the nation by stimulating research, technological development and innovation;

– Educate a *qualified labour force*, where the labour standards are adjusted to the European ones.

– The reduction in trade and investment in EU is likely to affect substantially the Moldovan economy. *Given the current financial crisis*, both fiscal and monetary policies in Moldova should support growth. Fiscal stimulus is essential to restore global growth; of course, this action implies a cost for future generation and financing constraints can be binding. Therefore the intervention of international organizations should be supportive.

Decisive actions should be taken by policy makers not only to improve the current situation of Moldova, but also to cope with the effects of the deep international economic downturn, that emerging markets cannot escape.

It is important to emphasize that labour market policies, fiscal policies, monetary policies can reach the desirable outcome not if formulated separately but only if there is a strong coordination among them. [49] At the same time, empirical analysis showed that employment growth, GDP growth and investment are variables so intrinsically endogenous that all the possible policies and variables should be taken into account. A pro-employment macro policy regime should be associated with the adoption of measures that regard the reduction of corruption, the tariffs, the exchange rate, the taxation, macroeconomic stability in general, educated and skilled labour force. Without a sound and business-friendly macroeconomic framework, micro policies, no matter how appropriate, will have little impact.

There is not a single recipe that can increase domestic employment, but an overall development strategy and the strongest cooperation among policy-makers that leads to coordinated policy actions are likely to reach the desirable outcome.

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[49] This result is also established in monetary policy analysis. See Hallet and Libich, 2007; Cukierman and Lippi, 2001; Dixit and Lambertini, 2001, among many others.

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Appendix

**Table A1.** **Rural population** (percentage of total population) **in 2006**

Moldova	**57.68**	Ukraine	32.14
Albania	54.56	Latvia	31.96
Bosnia and Herzegovina	53.72	Estonia	30.58
Slovenia	50.8	Bulgaria	29.5
Serbia	48.32	Russian Federation	27.12
Romania	46.12	Switzerland	26.64
Slovak Republic	43.68	Germany	26.52
Croatia	43.24	Czech Republic	26.5
Portugal	41.78	Spain	23.16
Greece	39.4	France	23.08
Ireland	39.22	Norway	22.64
Montenegro	39.14	Netherlands	19.26
Poland	38.56	Luxembourg	17.32
Finland	37.3	Sweden	15.62
Macedonia. FYR	34.1	Denmark	13.84
Hungary	33.3	United Kingdom	10.22
Austria	33.28	Iceland	7.78
Lithuania	33.28	Malta	6.18
Italy	32.24	Belgium	2.68

Source: WB.

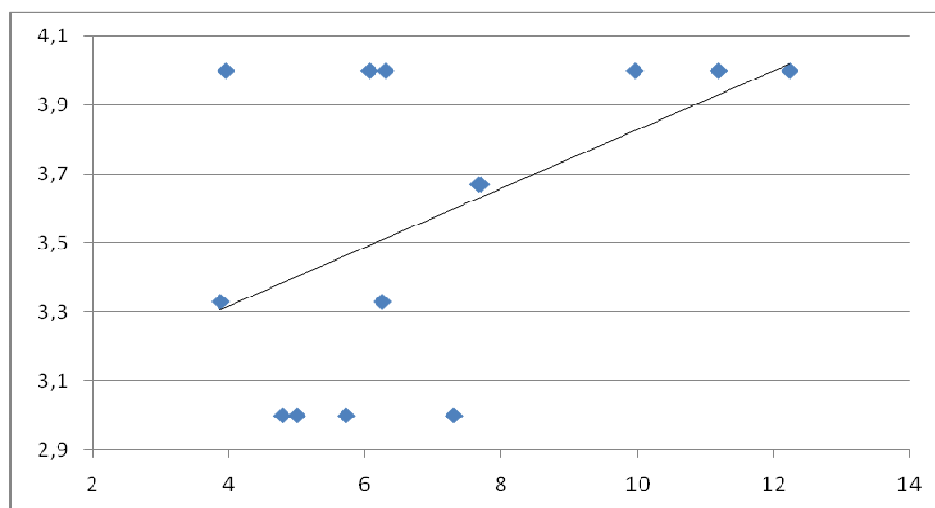**Figure A1.** **Unemployment rate**
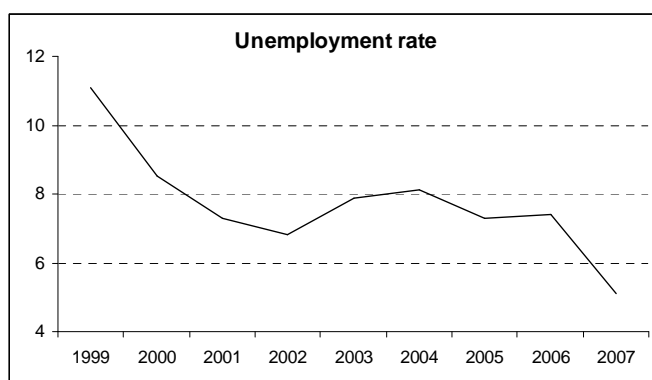
Source: ILO.

Figure A2.   **Large scale privatization and GDP growth**

Source: EBRD and WB.

Table A2.   **Formal/informal employment by sectors** (percentage)

Percentage	2003	2004	2005	2006	2007
Agr formal (% of total agr)	40.69	47.79	46.08	32.94	34.96
Agr informal (% of total agr)	59.31	52.21	53.92	67.06	65.04
Industry formal (% of total ind)	76.31	75.13	78.28	74.58	73.95
Industry informal (% of total ind)	23.69	24.87	21.72	25.42	26.05
Service formal (% of total service)	78.66	77.35	81.46	83.48	84.65
Service informal (% of total service)	21.34	22.65	18.54	16.52	15.35

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