
Preliminary
Analysis
Report of
Constraints to
Economic
Growth

Republic of Moldova

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Executive Summary

This Study represents a primary endeavor to accomplish a comprehensive analysis of constraints that impede the economic development of the Republic of Moldova. Thus, the potential constraints analyzed in this Study are related to difficulties in accessing financial resources, to issues generated by the geographical position of the country, to the situation in the area of human resources supply, to the status of infrastructure components, to innovation and competitiveness issues as well as to the problems related to macroeconomic risks and investment climate. An important tool used to identify the potential constraints is the comparison of Moldova performance with the achievements attained by other countries, especially by those from the Eastern Europe and the former USSR.

In this context, when we refer to the banking system of the Republic of Moldova, the actual researches and analysis performed show that the indicators of sector consolidation reached quite a good level. From the other side, the positive view is somehow crumpled by the structural problems related to deficiencies of corporate governance, legal framework and the lack of creditworthiness establishment system. However, the Study points out that the financial system is not yet fully developed, while the local financial market is immature. As a matter of fact, the bank loans are the ultimate and the primary source of financing for the production activity and investments carried out by the Moldovan firms.

As for the natural factors, although there are some concerns and problems, based on the analysis performed, it is possible to draw the conclusion that the aforementioned factors currently do not represent a critical issue. The Report especially underlines the potential of improved access to the trade markets due to the country proximity to the European Union as well as the fact that the country, in general, has got areas and spaces appropriate for development. The climate impact of the labor force is marginal. Concomitantly, the climacteric conditions and the soil status lead to rapid depreciation of the road infrastructure, while the supply with aquatic resources belongs to potential future problems.

With respect to human capital, even if the former is often mentioned as it could represent a major constraint; the main conclusion of the Study is that it cannot be regarded as a binding constraint yet. Although the premium for skills is high and it continues to grow, the Report has stated that the availability of a large number of holders of tertiary education among the migrants proves that Moldova has got idle human capacity. However, some evidences display the fact that enterprises with foreign capital offer higher scale of wages for a series of abilities/specialties considered as critical, which means that qualifications required by foreign firms differ to some extent from those demanded by Moldovan companies.

The situation in the infrastructure is characterized by a relatively reduced attention in terms of investments, and, practically, all infrastructure components may be described as deficient. The Analysis points out the fact that telecommunications have got fewer problems in the overall country infrastructure. At the same time, the electric power distribution and supply grid itself, as well as the network of water supply and sewerage, apparently do not represent binding constraints to business development. However, these require an increased regard in terms of allocating new investments to ensure high-quality services. But, the main conclusion is referred to the deficient road infrastructure, which seems to be the most affected due to the lack of investments, and has an impact on both the population and the development of businesses, especially in the regions.

In their turn, both the deficiency of innovations and the relatively low competitiveness, based on the Study conclusions, do not represent binding constraints to economic growth. Although there are some contradictory opinions, in comparison with other countries, the analysis demonstrates that, at regional standards, the Moldovan exporters diversify successfully the traded goods; researchers supply a large number of patents, and enterprises report positive innovational outcomes.

The main macroeconomic risks, apparently, are associated with the inflation rate upward trends and aggravation of the external deficits. However, we have to emphasize that both the increased inflation in 2006 and the external deficits were caused to larger extent by external shocks rather than by domestic policies. Currently, the economic growth trend has been marked out, and concomitantly, the inflation rate has been declining.

Finally, even if the situation in terms of investment climate is improving, the Analysis has identified several discrepancies. The Study shows that in comparison with other countries, the Republic of Moldova is less attractive for investments, particularly due to tough conditions for license and authorization issuance, rigidity of labor relation regulations, trustfulness in judicial system etc. Another critical factor is represented by the indirect costs related to taxation process. More studies identify the issues associated with the costs incurred for preparing and submitting the reports to relevant bodies, even if the size of taxes covered by these reports is not a major problem at all.

1 Constraints Analysis Methodology

1.1 Theoretical Prerequisites

During the first decade of the XXIth Century, the world economy has entered into a stage where more and more developing countries already exhausted the reserves of growth based on the implementation of policies formulated on the basis of Washington Consensus Principles. The most recent economic studies suggest that for these countries future growth and reduction of gap in comparison with the developed countries shall be based on the identification and removal of the so-called **binding constraints**.

In the framework of the present Report, the term *constraint* is understood as the lack or deficit/shortage of a complementary factor of the production function or another impediment of any type that lowers investment economic effect and, in this way, represents a non-incentive factor for private investments. Due to the fact that this definition of constraints is too broad, and that constraints of any type are present to some extent in the majority of world economies, we introduce the notion of **binding constraint**: it is such a constraint, which elimination brings a marked economic growth with substantial effect regardless the presence or preservation of other minor constraints.

The constraints analysis is focused on the reasons that serve as basis for capital holders in deciding whether to invest or not to invest. The approximation of the Cobb-Douglas production function, which will be used, has the following form:

$$Y = (1-\tau) * A * K^{\alpha} * L^{\beta}$$

Hence, the expected level of Output **Y**, being the main reason of investment decisions, depends on:

- The Rate of Appropriation **(1-τ)**, where **τ** represents all subtractions from the economic activity gross result, e.g. taxes, corruption, injustice, bureaucratic impediments etc.
- Productivity **A**, which shows the ability of the production process to transform inputs (such as Labor and Physical Capital) into outputs. The productivity coefficient **A** depends on the available knowledge, organizational capacity, the level of innovation etc.
- The stack of complementary factors of the production function, i.e. Capital (**K**) and Labor (**L**). The infrastructure may be also considered as a complementary factor because it influences the labor and capital productivity.

The costs of labor and capital are subtracted from the output. These costs comprise also invisible components related to the rigidity of hiring and firing conditions as well as difficulties in accessing financial resources (*credit rationing*).

1.2 Practical Approach

Different factors that may have a negative impact on parameters of the production function displayed above create the bunch of potential binding constraints, represented graphically by Annex 1. Concept of Constraints Analysis

In conformity with this representation, the potential constraints, addressed in this Report, sum up the following:

- **Scarcity of complementary factors of the production function:**
 - **Capital (K).** Difficulties in having access to both external financial resources (conditioned by the low rating or vulnerable position of the country) and internal financial resources (due to low level of savings or weak financial intermediation);
 - **Natural Conditions or Natural Capital.** Problems that arise from the country geographical position, access to external markets, climate conditions and availability of certain natural resources;
 - **Human Capital (L).** Disequilibria between the labor resources market demand and supply;
 - **Infrastructure** (production quasi-factor). The infrastructure enters indirectly in the production function, and serves as a basis necessary for the implication of other production factors and for carrying out economic activities as well.
- **Failures in innovations and competitiveness (A).** The inadequate coefficient of efficiency of the production process is caused by the failure to introduce changes and innovations, and this leads to gradual concentration on manufacturing a set of assets with low value added.
- **Low appropriateness of investments (1- τ):**
 - **Risks of macroeconomic nature.** Potential reasons of macroeconomic nature of low appropriateness include macroeconomic instability and volatility, tax regime and terms of trade unfavorable to exports.
 - **Investment climate.** This chapter analyzes macroeconomic risks and terms for doing business, e.g. fiscal practices, corruption, property rights and access to justice.

The main tool for claiming the existence of constraints in the mentioned areas is to compare the performance of Moldova in these areas with the results achieved by other countries, selected by the similarity principles for area, economic development, past common history and belonging to the same group or region. In order to ensure relevant comparison, the following countries have been selected:

- „Similar” countries, with common past history and comparable development level: Ukraine, Romania, Albania, Bulgaria, Armenia, Georgia, Kyrgyzstan, Macedonia;
- „Target” countries, with comparable physical size, new members of the European Union, with a development level and economic growth rate higher than Moldova’s: Estonia, Latvia, Lithuania and Slovakia.

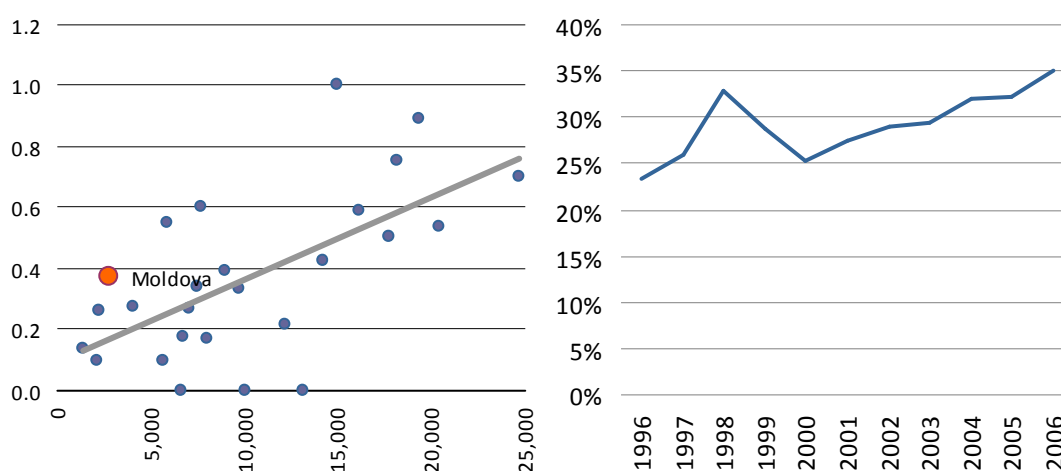
In certain cases, in order to get a more comprehensive picture, the list of countries selected for comparison may be enlarged, especially on the account of the Eastern European countries and of the former USSR. The Report used comparable data collected by specialized international organizations for the mentioned countries. These data cover got both subjective patterns (perceptions and indexes built up on questionnaire bases) and objective patterns (economic parameters and indexes synthesized artificially). Some aspects of this Analysis, with the focus on internal dynamics of indicators, use the data provided by the National Bureau of Statistics and by other institutions from the Republic of Moldova.

2 Financial Sector

2.1 The Banking System Indicators

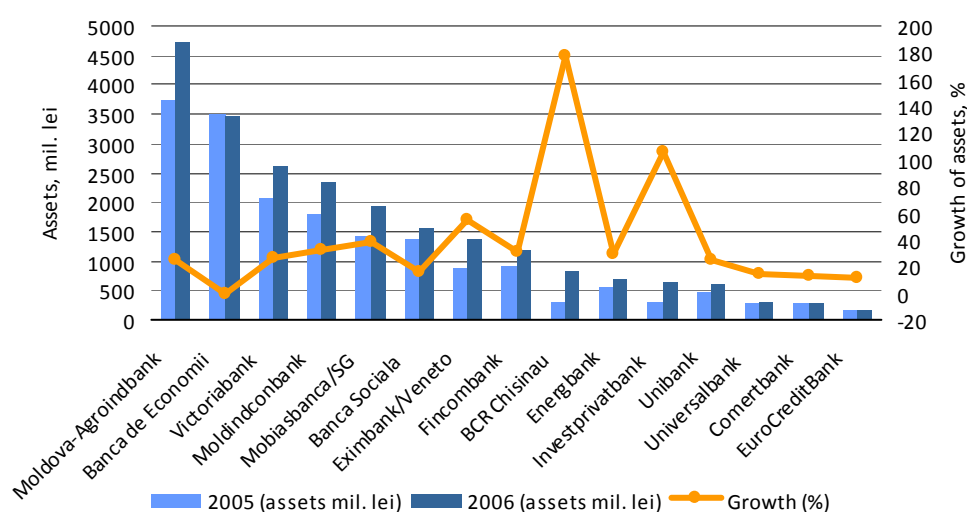
Currently, there are 15 banking and financial institutions acting in the Republic of Moldova, out of which two are banks with foreign capital. The overall number of banking institutions (branches, representations) increased from 388 in 1999 to circa 900 in 2006. Thus, the banking sector depth is in continuous enhancement, which in most of the cases is adequate in comparison with other countries from the region (Figure 1). The banking system total assets are estimated at circa 23 billion Moldovan Lei (1.75 billion US Dollars) and represent over 50% of the GDP (2006). Within the period of economic growth *the commercial banking credit* increased about six times. Respectively, credits advanced to the national economy made up over 35% of GDP in 2006.

Figure 1. Depth of financial system and banking credits as percentage of GDP



Source: Authors' computations based on the Economist Intelligence Unit data (EIU-Country Data: Annual Time Series), EBRD, NBM monthly and quarterly reports.

The first six banks from Moldova hold nearly 75% of the banking market assets (Figure 2) and total credits provided to the Economy. The largest weight of savings, circa 55%, is being held by deposits in local currency, while approximately 45% - in foreign currency. The overall bank deposits are estimated at over 15 billion Moldovan Lei or circa 33% of GDP (est. 2006). In 2006 the proportion of foreign investments in banks capital was 62.7%. The entrance of some foreign banks to the market will contribute to the establishment of a broader financial diversification and to a more efficient allocation of resources in the economy. In addition, the appearance of foreign banks could trigger the development of stock markets, investment funds and pension funds as well as insurance; and these segments are at an incipient stage of activity in the Republic of Moldova.

Figure 2. The ranking of Moldovan banks based on the volume of assets

Source: Authors' computations, NBM monthly and quarterly reports; EIU-Country Data

At present we can affirm that the banking system of the Republic of Moldova has reached an equilibrium level, and the number of banks remains constant since 2002. The performed research shows that the banking sector consolidation indicators have achieved a good level, while the positive picture is affected to some extent by the structural issues related to the:

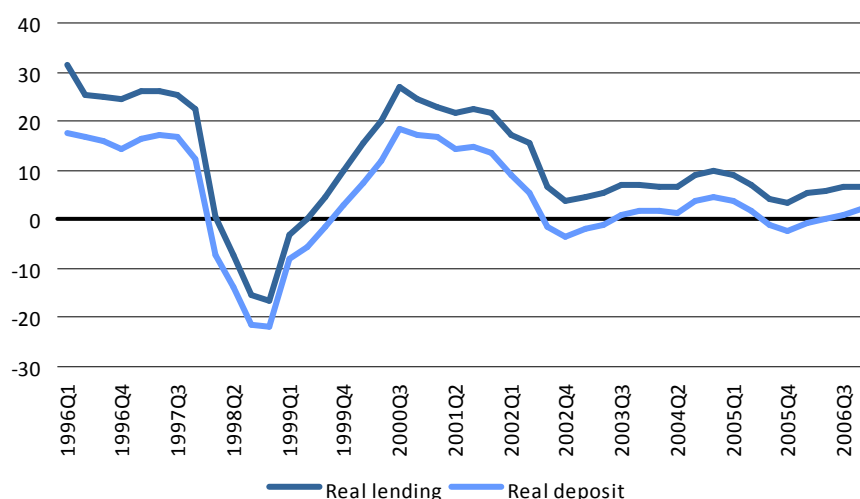
- Corporate governance deficiencies;
- Legislative framework;
- Lack of bureaus of credit history so far;
- Blurred proprietorships¹.

2.2 Interest Rates

Along the years **the loan and deposit real interest rates** have displayed downward trends (Figure 3). Thus, the interest rates balanced evolution would mean constant supply of financial resources to the Real Sector, which, in turn, would support a uniform gradual growth of the Economy without any major fluctuations.

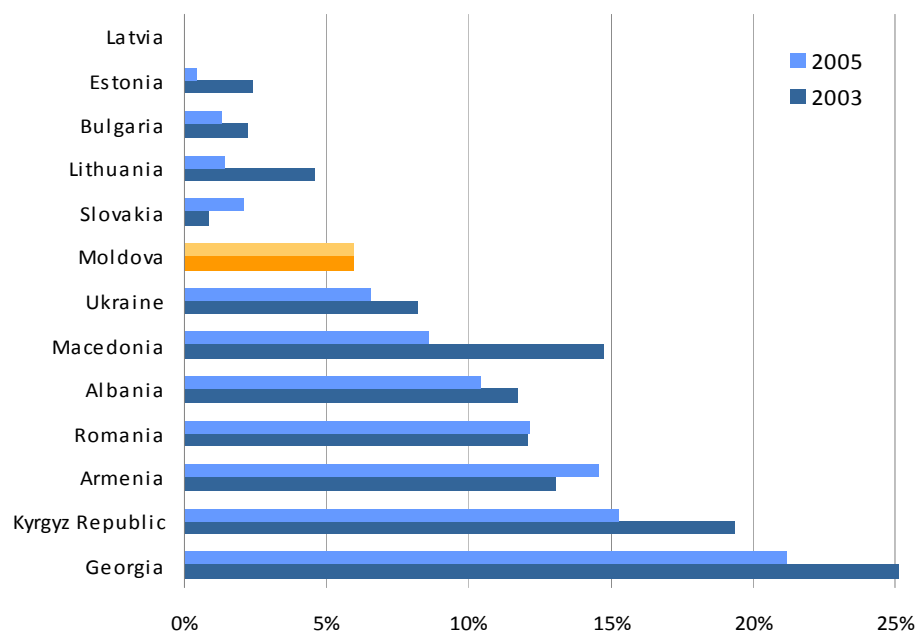
However, some economic agents and businessmen believe that the interest rates in the Republic of Moldova are high. Although, in fact, the banks use the main macroeconomic indicators as guidelines to set up the level of interest rates, because the high level of outstanding debts/arrears of economic agents to banks or the large volume of non-performing loans could be some of the reasons that determine the banks to increase the interest rates as a way to maintain some minimal liquidities for financial activity.

¹ International Monetary Fund, 2005

Figure 3. Evolution of loan and deposit real interest rates, %

Source: Authors' computations, NBM monthly and quarterly reports; EIU-Country Data

Moreover, bank loans are provided to the economy at interest rates higher than the costs of resources and not lower than the inflation rate. After all, we can affirm that the loan real interest rate is reasonable according to the regional standards (Figure 3). **Even the bank margin** – the difference between the interest rates for loans advanced and deposits attracted – **is not very high**; in the second half of 2006 it was about five percentage points.

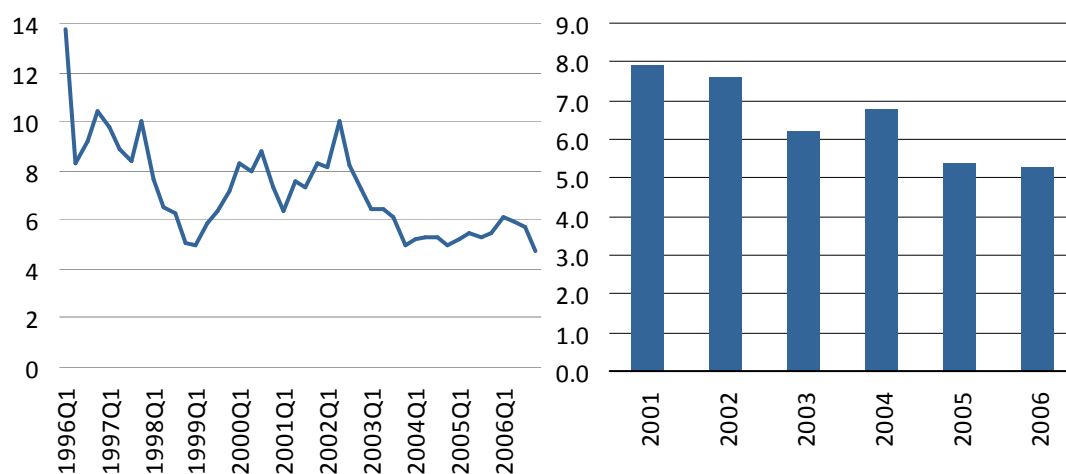
Figure 4. Loan real interest rates: regional aspects.

Source: EIU-Country Data: Annual Time Series, EBRD, 2006

Thus, the bank margin is comparable with the average levels recorded by the CIS countries, the endogenous banks having become more efficient – and this fact will be enhanced also by the admission of foreign banks. In any case, lowering the interest rates could be achieved exclusively by two routes: a) *diminishing the nominal rate* – anti-inflationist policies (targeting inflation) and b) *diminishing the*

bank margin – maximization of competitiveness through attracting foreign banks and strengthening the non-banking sector (Figure 5).

Figure 5. Bank margin² and the weight of non-performing loans, % of total

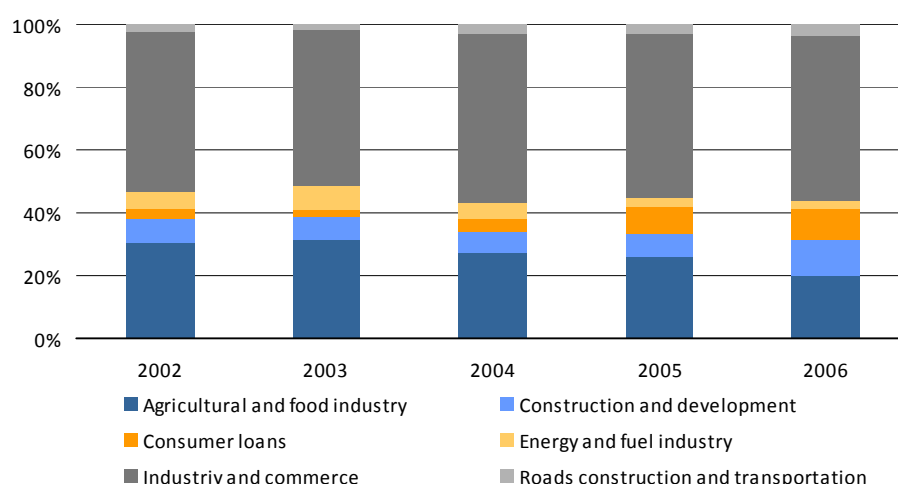


Source: NBM annual and monthly reports, 1996-2006

2.3 Lending Dynamics

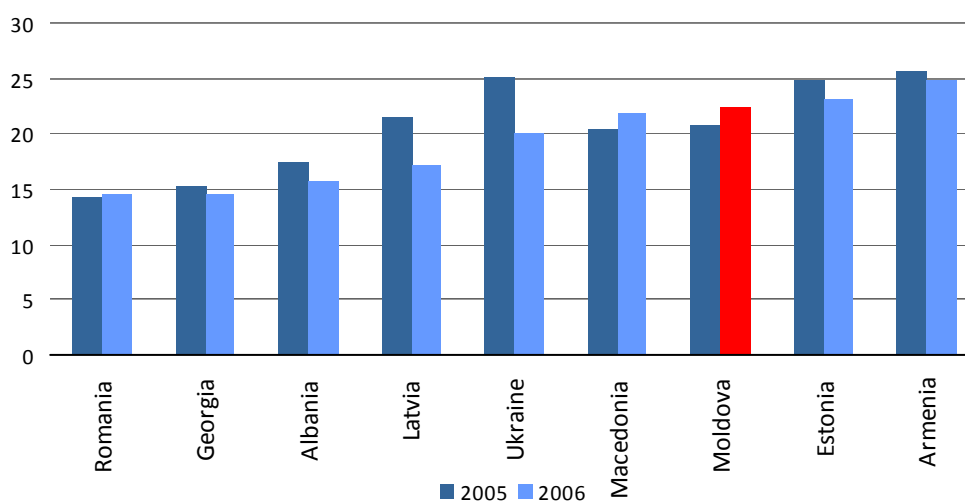
In the course of the past period, the banking system has recorded high levels of profits, gains and capitalization, a situation that offered sound possibility to provide adequate level loans to the real sector. For instance, in 2006 the balance of loans contracted increased by over 33% in comparison with 2005, including the consumer loans. If until the year of 2004, there was a reticence remarked among the banks in advancing consumer loans, then the situation has been improved substantially since 2005. The weight of this type of loans grew up from 3.6% to circa 10% in 2006 in the portfolio of bank loans with reliable growth trends during the next two years to over 12% (Figure 6). This domain of financing not only contributes to the increase of population welfare directly, but also indirectly influences the economic growth.

² Difference between the loan and deposit interest rates.

Figure 6. Loan structure, % of total loans advanced to the economy

Source: NBM annual and quarterly reports, 2001-2006; <http://www.bnm.org/md/index.html>

At the same time, the population savings have been boosted up, including the saving rate as a result of high volume of money transfers from the Moldovans working abroad (Figure 7). However, the slow pace of structural reforms and the lack of policies for re-channeling the remittances impeded the opportunity to use these large inflows of foreign currency for productive purposes. The positive effects of remittances have dominated over the negative ones. And this determined the appreciation of the Moldovan Leu, which in turn, stimulated the import consumption, but deteriorated the external competitiveness of domestic products.

Figure 7. Savings rate, growth in %

Source: EIU-Country Data: Annual Time Series, EBRD, 2006.

In conclusion, in generally **the banking system is adequately developed**. Concomitantly, our analysis shows that the recorded economic growth may be associated both with a strong increase of loans advanced to the private sector and with the rise of foreign investments marked in the course of the past years. In the same time, the local finance market is immature and the bank loans are the ultimate and the primary source of financing for the Moldovan firms. The main constraints of the banking sector include the following:

- **Asymmetry in lending activity**, which could be explained by the fact that banks prefer most frequently to provide loans to large enterprises, while small and medium-sized enterprises, although predominant numerically, do not quite benefit from a essential increase of loan volume³.
- **Banks temporary preferences** that could be explained by their low level of confidence towards the economic evolution (the country macroeconomic conjuncture). So far, the banks prefer advancing short-term loans, because the bank resources are created to a great extent from deposits, which are also of short-term type.
- **Ambiguity of the field-related legal framework**, which complicates the banks sound activity due to long-term disputes among them and businessmen in courts of justice; and makes them discreet in contracting new loans intended for production activity or investments.

³ International Monetary Fund, 2005.

3 Natural Capital

3.1 Natural Capital Factors

The importance of country endowment with natural capital favorable for quick growth and development is a well-acknowledged phenomenon. By natural capital we understand the aspects of economic and non-economic nature, both benefic and detrimental for development, that emerge as a result of specific geographic positioning of the country and environmental circumstances. Such aspects include:

- The country position that reverberates through the access to the main trade markets, and the country size that offers or impedes the opportunity to exploit the agglomeration economies (comparatively to other countries from the region)⁴;
- Supply with good quality land as potential for agricultural activities and potential for human development;
- Climate conditions, including the water availability and climate-associated diseases.

This Chapter will analyze the country supply with other natural resources because, on the contrary to persistent opinions, their scarcity is not a constraint to economic growth.

3.2 Size and Location

Moldova is both a small and land-locked country. Actually, it is located in the Eastern Europe and landlocked within two large neighboring countries, with 170 km-distance to the closest maritime port. The lack of access to any sea has been historically associated with delays in development due to the fact that such a country relies heavily on the relations with the neighbors, their infrastructure, the external stability and policy in order to have access to its trade markets. As a small open economy, Moldova depends on exterior trade much more than its neighbors or competitors. Thus, the ratio of trade with goods to GDP is 117% (2005) for Moldova, compared to 85% for Ukraine and 69% for Romania.

The difficulties of accessing the trade markets may be captured by the Transportation Cost Index, which represents the ratio of expenses incurred for transportation and insurance to the export price⁵. Faye et al (2004)⁶ estimated this

⁴ A larger country has got additional opportunities to exploit the benefits that emerge from agglomeration economies.

⁵ In prices INCOTERMS, (CIF-FOB)/FOB

proportion for Moldova at the level of 10%. In relative terms, by using the scale from 0 to 1 (from the unaffected to the most affected), Moldova is ranked pretty high (0.86) among other comparable landlocked countries (**Error! Reference source not found.**), which proves that the geographical position could be a problem. This high classification is supported also by historical evidences of transit restrictions imposed on Moldovan goods by the neighbor countries at the early stages of transition.

Table 1. Relative Transportation Costs Index for the landlocked countries

Country	Afghanistan	Armenia	Turkmenistan	Kyrgyzstan	Moldova	Azerbaijan
Relative ITC	0.38	0.51	0.77	0.81	0.86	0.92

Source: Faye et al (2004).

At the same time, Faye et al (2004) argued that the availability of a strong focus of stability and economic growth in close neighborhood to the country (like the EU for Moldova, since 2007) may reduce or even annihilate the negative impact of positioning, by offering a developed proper transportation infrastructure and negotiating favorable commercial agreements. The main trade partners of Moldova (EU, SEE and CIS), placed in the radius of 2,000 km, satisfy 91% of Moldovan exports and 84% of its imports, and the national economy does not rely heavily on certain resources or markets placed far away. We can draw the conclusion that the geographical position had been and still is, at some degree, an issue, but its role will be definitely diminished along with economic growth and infrastructure development in the neighboring countries, negotiation of commercial and transit agreements, and improvement of export practices.

3.3 Terrain Endowment

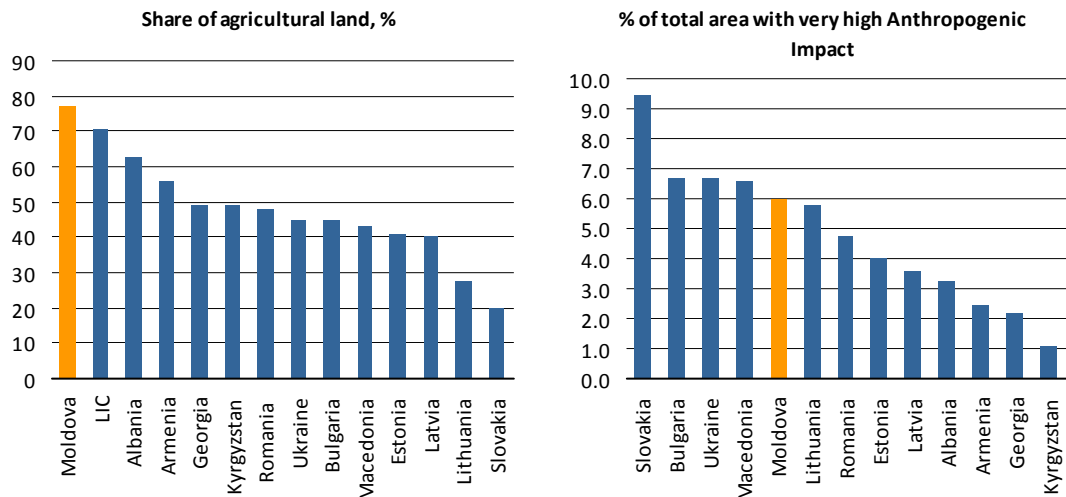
The supply with agricultural land is excellent. Moldova is positioned neither in mountains nor in flood plains, and the arable land represents 77% of its area. The supply with land plots is much better in Moldova than in the comparable countries (Figure 8). Likewise, currently Moldova has no constraints with respect to spaces available for carrying out human activities. Although the current anthropogenic impact is higher (6%) than in some comparable countries, it is situated below the world average (8.4%) and far under the values recorded by the developed countries.

The geological and soil conditions have a certain impact on the depreciation pace of physical capital. The regional geological instability leads to frequent earthquakes of average magnitude. Starting with 2000, seven earthquakes of 4 to 6 degrees of magnitude have been recorded, while potentially devastating earthquakes of 7-8 degrees typically take place every 15 years. The incidence of earthquakes imposes additional costs in constructions.

⁶ Faye et al, Journal of Human Development Vol. 5, No. 1, March 2004

Landslides represent a much more spread phenomenon with a more marked effect with 12 to 268 cases recorded annually. Lately more than half of administrative and territorial units of the country have recorded landslides. The road network is considered as one of the most affected by landslides and plot movements, combined with numerous cycles of frosting-defrosting processes in the course of winter. Concomitantly, the incidence of landslides cannot be considered as a major factor of constraint, because in Romania, for example, this incidence is even higher.

Figure 8. Supply with Land Plots and the Current Anthropogenic Impact.



Source: World Little Green Handbook, WB, 2007, and Environmental Sustainability Index 2005

3.4 Climate Conditions and Internal Water Resources

The climate-related risks are enhanced in case of agricultural activities. The annual rainfalls vary from 307 to 800 millimeter (2002-2005) and in most of the cases are suboptimal for the typical products with an increased value-added. Additionally, there is a significant volatility in the annual, monthly and regional distribution of the rainfall. Both droughts and excessive rainfalls are frequent. Year by year, the rainfall standard deviation is 60-83% for the typical summer months.

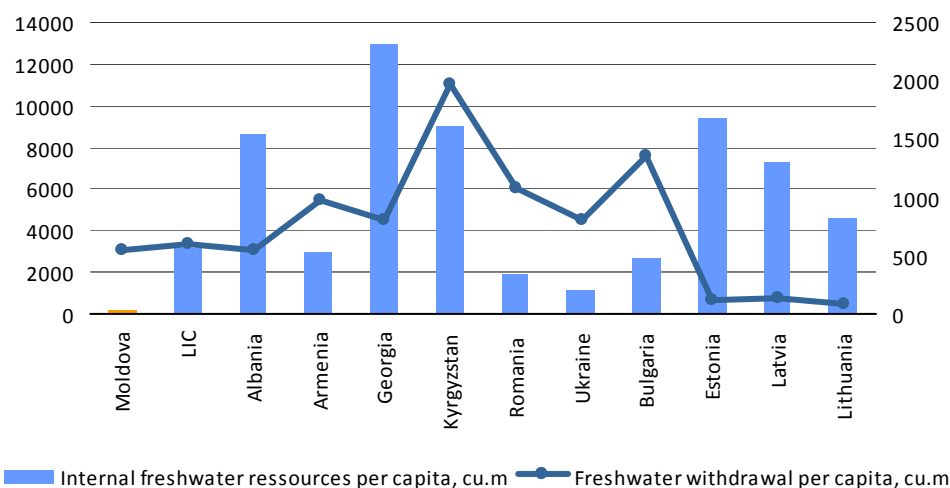
The typical agricultural crops are sometimes affected by winter frosts, while high productivity crops are damaged utmost from spring frosts. Invasions of plant pests and diseases over the high productivity crops are pretty frequent, but, in contrast, may be kept under control in case appropriate investments are made in plant protection. At the same time, there is no evidence that the climate risks belong to binding constraints since in such situation the private sector would react by making more investments and using the available tools for control and preventions and by extensive irrigation⁷ as well.

Moldova confronts with high shortage of water resources. As it is portrayed in Figure 9, the internal freshwater capacity constitutes just 238 cubic meters per capita per annum, in comparison with 1,955 cubic meters in Romania and 1,128

⁷ It is worth mentioning that the lack of investments in irrigation may be attributed also to *coordination failures*, but not to the fact that droughts do not represent a constraint.

cubic meters in Ukraine. In terms of aquatic resources, Moldova holds the worst position in comparison with all countries from the region. Moreover, there are proofs that the existing capacities are overused; hence, the annual withdrawal of freshwater exceeds 2.5 times the capacity (Figure 9).

Figure 9. Freshwater Capacity and Withdrawal

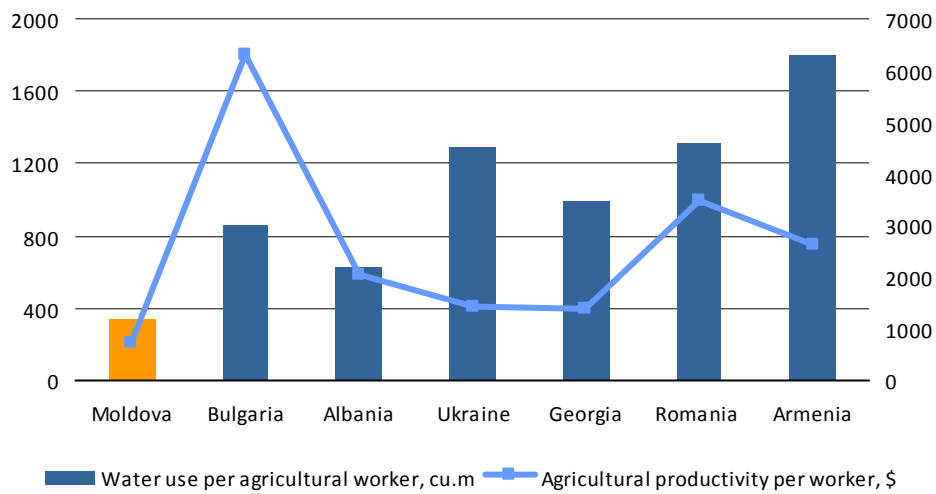


Source: World Development Indicators 2007, WB

There is no reason to support the affirmation that the overuse of aquatic capacity takes place because of extensive use of water in agriculture. Only 33% out of the total water withdrawn is used for irrigation, which is substantially below the levels recorded by comparable countries (with similar latitude and climate conditions; 57% and 52% in Romania and Ukraine, for example). Furthermore, within 1998-2005, the irrigated area was reduced from 306 to 228 thousand hectares, while the volume of water used for irrigation fell from 264 to 140 tones per hectare.

Along with the rehabilitation of the economy and agriculture in particular, the scarcity of freshwater resources will increase. In the long run, the deficiency of water may become an important constraint to economic growth. For instance, other countries with similar climate conditions use much more water per Agricultural Worker as it is shown in Figure 10 (the use of water is shown on the left axis, and the productivity – on the right axis).

Figure 10. The use of water and agricultural productivity

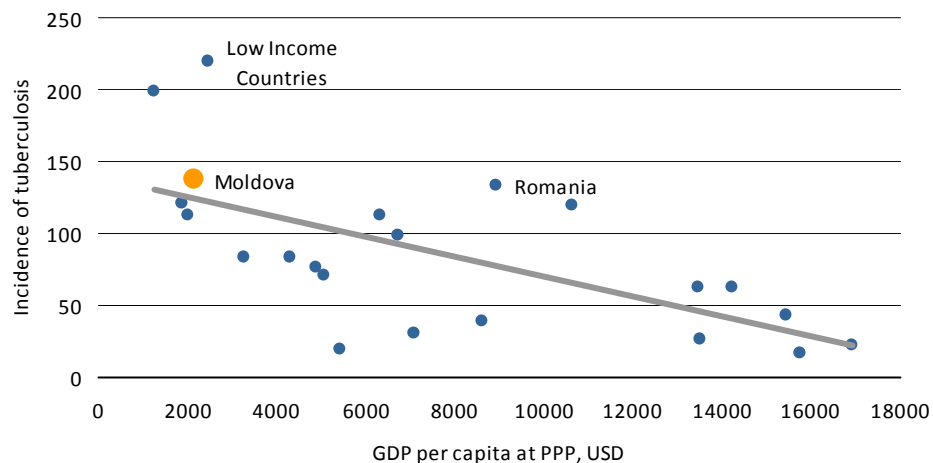


Source: World Development Indicators 2007, WB

3.5 Climate-Associated Diseases

In general, the climate conditions in Moldova are not associated with any epidemics of climate-related diseases. The climate in Moldova is temperate continental with warm and dry summers and mild winters. However, the tuberculosis is a source of concern, as portrayed in Figure 11. The incidence of tuberculosis is 138 cases per year, ranking between the values recorded in most of the comparable countries (40-70) and in poor countries (220).

Figure 11. Income and the Incidence of Tuberculosis, per 100,000 inhabitants



Source: World Development Indicators 2007, WB, author's calculations.

In the incidence of tuberculosis regression⁸ over the development level (stated as GDP per capita), the result of Moldova is situated over the general trend line,

⁸ Based on the hypothesis that the principal factors of TB are related to climate, malnutrition and underdeveloped healthcare system. The last two factors are indirectly captured by the economic development level.

suggesting that the performance achieved by Moldova in fighting tuberculosis is much smaller than it was expected from a country with such an income level. The incidence of TB is practically identical in Moldova, Ukraine and Romania, despite the substantial discrepancies in economic development, which, in fact, reveals that in case of Moldova, the climate effect over TB is much stronger than the effect of other factors. Concomitantly, we cannot consider TB as an important constraint, because its global impact over the labor force is marginal; moreover, the labor force itself is not a constraint at the moment, as it has been discussed in this Report.

In conclusion to this Chapter, we cannot consider the natural factors as binding constraints at the moment, although there are some concerns and problems. The access to trade markets will improve further due to the proximity to the EU; the supply with land plots and spaces for human development is pretty good, and the climate effect over the labor force is marginal. At the same time, the climate conditions and the soil status lead to rapid depreciation of the road infrastructure, while the supply with aquatic resources belongs to potential future problems.

4 Human Capital

4.1 Assessing the Human Capital Endowment

Human capital represents a complementary factor of the function of production presented in the Methodology. The complementarity of human capital offers the possibility to estimate whether it represents a constraint to economic growth.

In case the supply with human capital is relatively constrained in comparison with other complementary factors of the function of production (capital, infrastructure etc.), we shall notice the following economic phenomena:

- High differentiation in wages depending on skills and knowledge (*high rate of returns on additional education, or high premium for qualification*). The educated qualified employees will have much higher wages than those with no qualification.
- Substantially distorted distribution of unemployment depending on the level of education. The unemployment rate among the holders of higher education would be pretty low.
- Substantial efforts of enterprises aimed at providing continuous training to their employees, because businesses require much higher qualification than that offered on the labor market.

4.2 Returns to Education

In case of scarce human capital, we will notice large premiums paid to highly skilled employees. In practices of econometric studies, skills are captured by the level of education and the impact of education on salaries is measured through the so-called Mincer regressions:

$$\text{Ln } Sal = B_0 + B_1 educ + B_2 exp + B_3 exp^2 + e$$

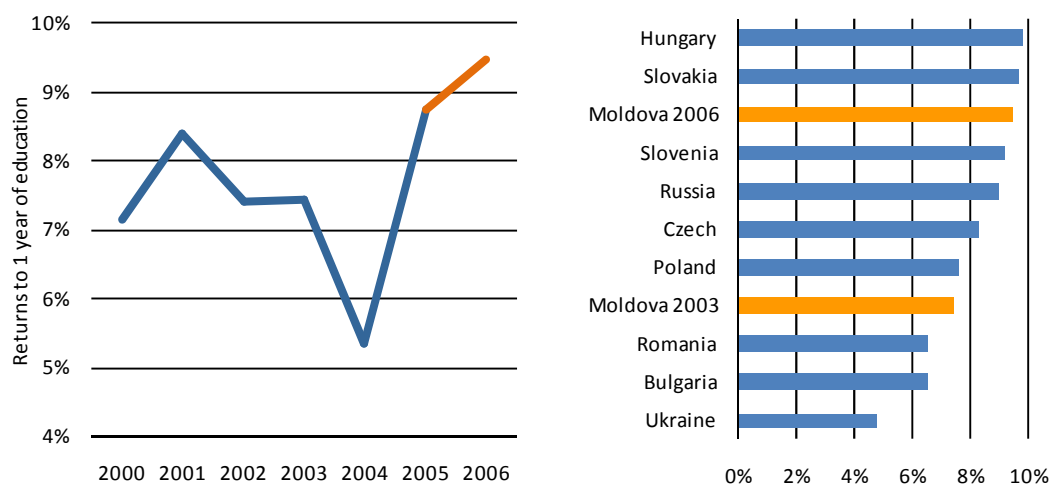
Where $\text{Ln } Sal$ is the natural logarithm of the salary per hour, $educ$ is education, and exp is work experience. The coefficient B_1 represents the percentage increase in salary per hour for each additional year of education (*rate of returns on one additional year of education*).

The premium for qualification is relatively large. The results of the Mincer regression⁹ are presented in Figure 12. The Graph from the left shows the

⁹ The baseline data of the Households Budgets Research for 2000-2006 have been used, NBS.

evolution of the rate of returns to education (additional premium for each additional year of education) from 7.2% in 2000 to 9.5% in 2006.¹⁰

Figure 12. Rate of returns to one year of education: evolution in Moldova and its comparison with other countries



Source: For Moldova: Authors' computations using the data CBGC 2000-2006. For other countries: Fleisher, Belton M; Sabirianova Peter, Klara; Wang, Xiaojun. 2005. "Returns to Skills and the Speed of Reforms: Evidence from Central and Eastern Europe, China, and Russia", *Journal of Comparative Economics*, 33(2) pp. 351-70.

There are two explanations to this relatively important increase of premium. In case holders of higher education would represent a large proportion in the migrated labor force, then migration would have led to scarcity of qualified labor, and to a high premium for qualification afterwards. Concomitantly, the CBS-AXA Report on migration and remittances in 2006 shows that the weight of people with higher education among migrants is lower than in the domestic labor force - 18% and 21%, accordingly.¹¹ The second explanation is that over the past years other complementary factors of the function of production became more abundant and based on that the marginal labor productivity increased, thus, allowing larger payments for qualified labor.

The right panel compares the rate of returns to education in Moldova (2003 and 2006) to the rate in other countries from the region (the data for other countries are for 2002-2003). In 2003, the premium for qualification was comparatively small, but it increased substantially in 2006. In case we assume that the skill premium has not been improved in other countries, then Moldova is among the regional leaders. At the same time, it is possible that this premium also increased in other countries due to reasons similar to Moldova – brain-drain and gradual increase of supply with physical capital. Further we can assume that the rate of

¹⁰ It is worth mentioning that the results for 2006 are not comparable in full with the rest of the period due to the change of the sampling method used by the NBS. The results for 2004 are also doubtful, perhaps, due to the data quality.

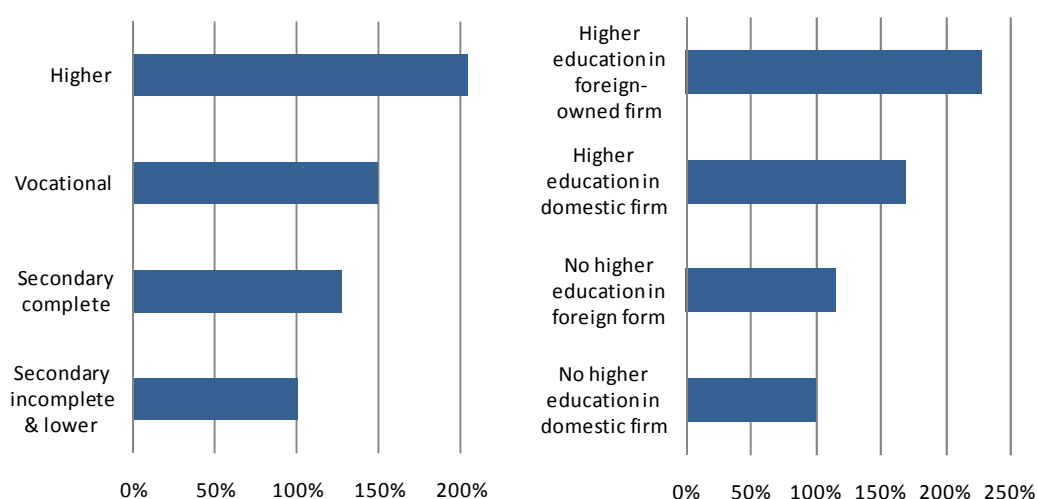
¹¹ The results selected from the CBS-AXA 2006 survey are available at http://www.iom.md/materials/migrants_day2006_en.pdf.

returns to one additional year of education in Moldova is at the average regional level.

The results derived from the data of Household Budget Survey may be checked by using the data from the Labor Force Survey (BNS) from 2006. The rate of returns to one year of education in 2006 was evaluated at the level of 13.4%, which is much higher than the results derived from the CBGC. The regression results are presented in Table 1 from Annex 2.

Another possibility to measure the education is to use the levels of education (secondary, secondary vocational, higher etc.). The regression results based on this method are presented in Table 2 from Annex 2. Thus, a university diploma is associated with a salary that is twice as large as the one established for incomplete secondary education (left panel, Figure 13), and the specialty secondary education is paid 50% more than the incomplete secondary education.

Figure 13. Economic returns to education by the level of education (incomplete secondary education=100%)



Source: Authors' computations using the data of the Labor Force Survey from 2006.

Some international companies mention that they encounter certain problems in employing local skilled labor force. These affirmations could be tested by having introduced additional interactions in the Mincer regression. The results are shown in Table 3 from Annex 2 and presented graphically in the right panel from Figure 13. In a domestic company, an employee with higher education benefits from a salary by 70% larger than an employee without higher education. In case of a foreign firm, this discrepancy is much higher - 129%.

The premium for skills, pretty high though, is not sufficient to affirm that the human capital is a binding constraint. The main conclusion is that the premium for skills is large and is growing. Concomitantly, the availability of a large number of holders of higher education among the migrants proves that Moldova has got idle human capacity, and that the increase of premium for skills does not mean yet that the human capital has become a binding constraint. However, some evidences display the fact that enterprises with foreign capital offer higher scale of wages for a series

of abilities/specialties considered as critical, which means that qualifications and work skills required by foreign firms is scarcer on the domestic labor market than those demanded by Moldovan companies.

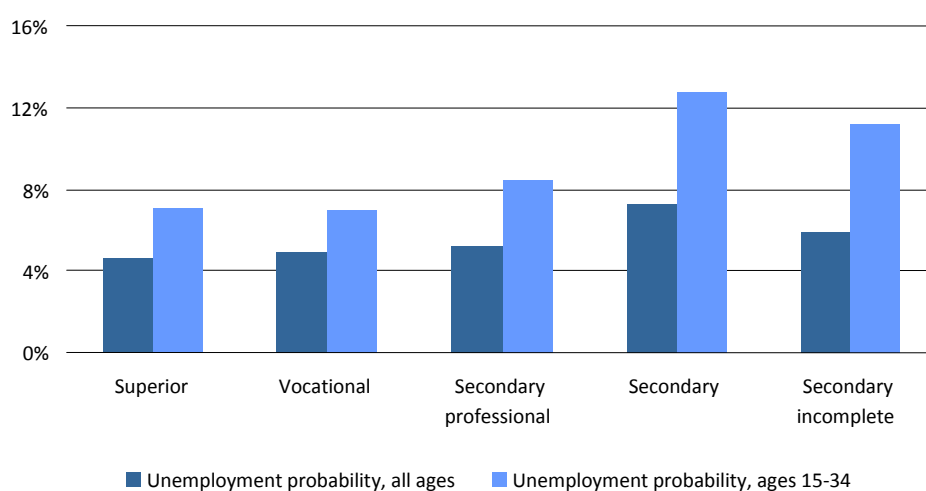
4.3 Distribution of unemployment

Another way to assess whether the human capital is a binding constraint is to analyze the unemployment rate versus the level of education. Should the critical skills and knowledge be scarce then the unemployment rate among the holders of such skills and education would be extremely low.

Another possibility to capture the insufficiency of critical skills on the labor market is to compare the unemployment rates versus the level of education for the employees aged 15 and 34 year only. Here the rationale consists in the fact that these persons have got more relevant education (acquired after the initiation of the transition period), and in general are more flexible and mobile. If the human capital represents a binding constraint, then the distribution of unemployment among the holders of different levels of education, aged from 15 to 34 years, would be even more distorted – we will notice absolutely low unemployment among the holders of advanced education from this group.

Figure 14 presents the unemployment rates versus the level of education (all age groups and the group of 15-34 years old). One immediate remark is that the unemployment level among the holders of higher education is slightly lower (4.7%) than the national average (5.6%), but not extremely lower. Furthermore, the overall distribution of the unemployment rate is pretty uniform, without any substantial variations.

Figure 14. Unemployment rate by levels of education



Source: Authors' computations, NBS 2005 data

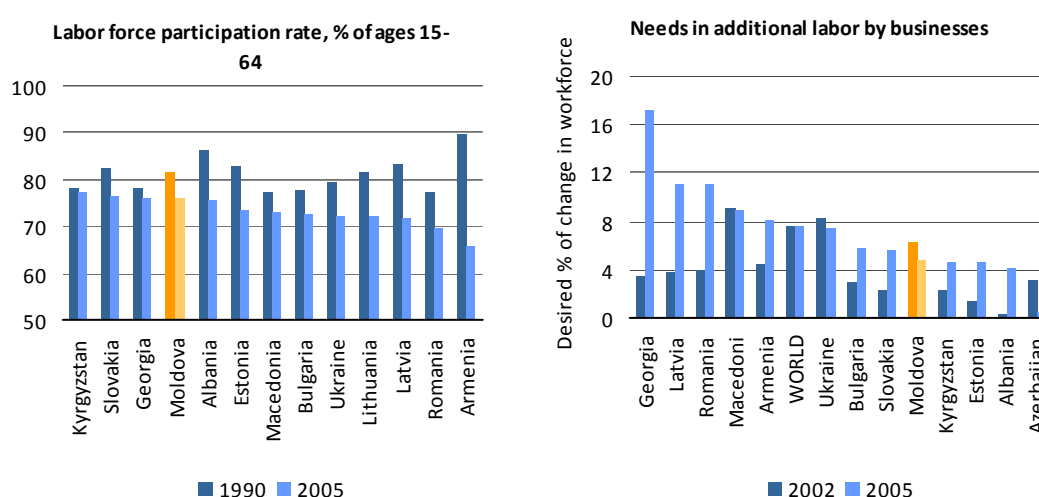
As regard to persons aged 15-34 years, the unemployment rate among the holders of higher education is smaller than the average for this age group (7.1% versus 9.3%), however, this difference is rather insignificant.

Thus, the unemployment rate distribution by levels of education does not show acute scarcity of critical skills demanded by the labor market. Moreover, an important remark (and counter-intuitive) is a higher unemployment rate among the holders of recent advanced education, which reveals potentially certain problems related to the quality of advanced education and the relevance of education agenda/curriculum for the market economy needs.

4.4 Enterprises Perception

Enterprises from Moldova need no additional labor resources. The level of ensuring the economy needs with labor force is portrayed in Figure 15. The labor force participation rate (left panel) is at the regional average level, and does not depict any potential problems. The right panel shows the estimation, by businesses, of the needs for additional labor force in comparison with other countries from the region; this estimation is pretty low, and, distinctly from other countries, has got a downward trend compared to 2002. These evidences suggest the idea that enterprises are not constrained by the availability (or volume) of labor resources.

Figure 15. Provision with labor force



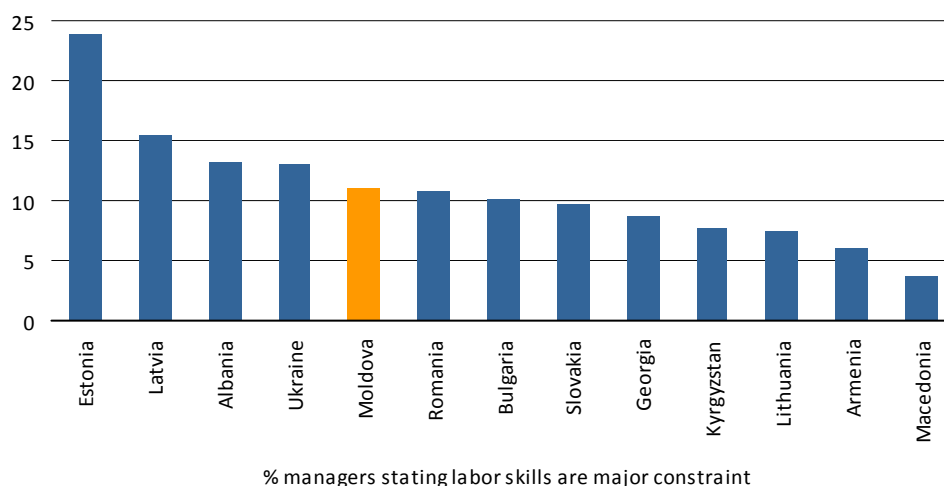
Source: Enterprise Survey Index 2005, World Development Indicators 2007, World Bank

Enterprises in general do not think labor force quality is an issue. The labor force quality or skills is a complementary factor to the volume of work used. The opinion concerning the existence of labor force skills-related major problems is widely spread; however, Figure 16 demonstrates that only 11% of Moldovan employers mention the labor force quality as an important or binding constraint, which is at average in comparison with other countries from the region.

As a result, the enterprises do not invest in labor force education/training. In case enterprises need more skillful labor force than it is available on the market a widely used way to resolve this constraint is to provide on-the-job formal training. The standard economic practice suggests that those enterprises that realize the need to make these investments, but for some reason they decide not to do it, they lose from competitiveness and are gradually eliminated by other enterprises that

record higher marginal labor productivity as a result of better skills of their employees.

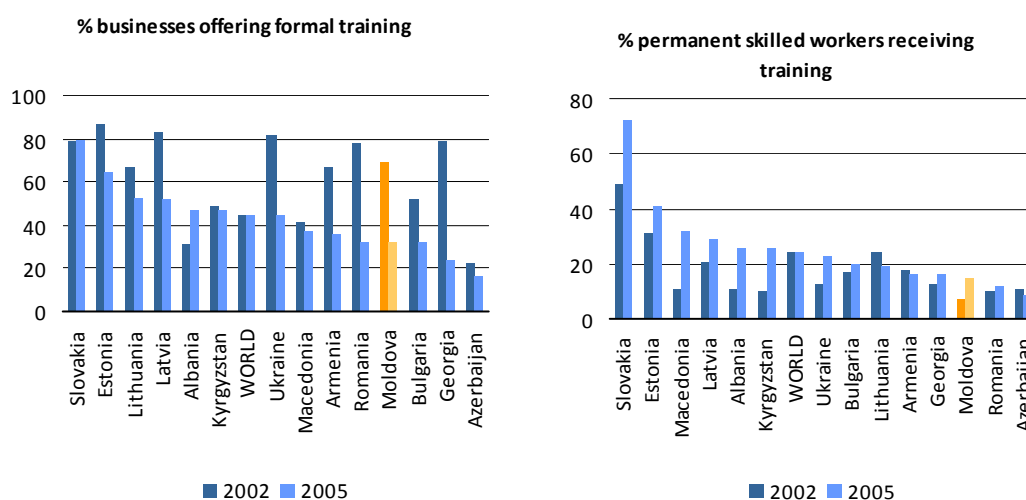
Figure 16. Perception of labor force quality by enterprises



Source: World Development Indicators 2007, World Bank.

In case enterprises do not consider the labor force skills as a major issue, they do not invest massively in education and training of labor force, as it is shown in Figure 17.

Figure 17. Labor force education and continuous training at enterprises



Source: Enterprise Survey Index 2005, World Bank

These graphs denote the fact that comparatively with other countries, businesses, in general, do not need more skillful labor force than the one offered by the labor market. Only up to 20% of permanent skilled employees received on-the-job training recently.

Hence, the Moldovan economy does not perceive the availability and current skillfulness of the human capital as a binding constraint to growth and development. It is worth mentioning that this perception is contaminated to some extent by subjectivism. However, businesses perception is supported in full by the

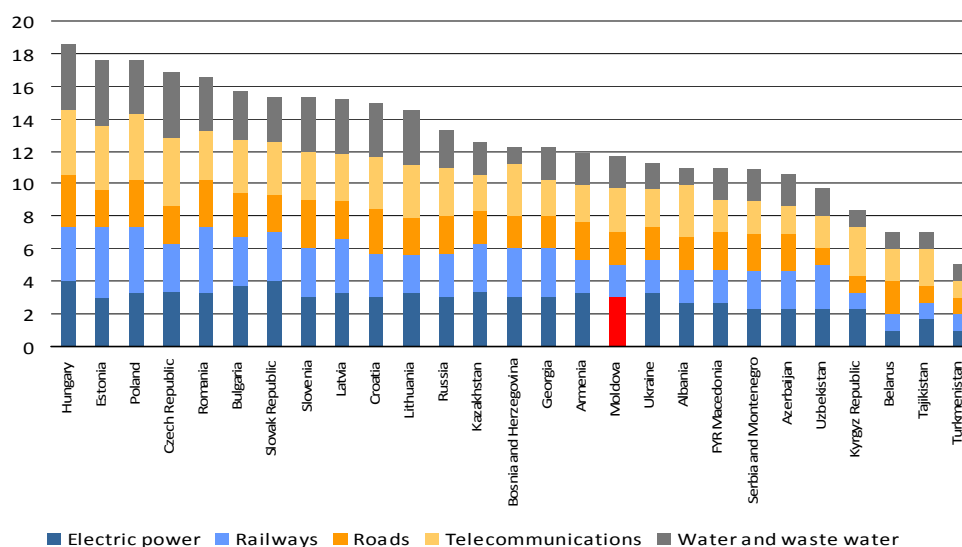
unemployment breakdown analysis results and in part by the analysis of high premiums granted for skills, presented previously. Overall, the series of accumulated proofs enable us to affirm that (in present, at least) the human capital is not a binding constraint to growth and development.

5 Infrastructure

5.1 General overview

Since the time the Republic of Moldova gained independence, its infrastructure, except for telecommunications, has not benefited from great attention and investments; and could be shortly described as “deficient”. This definition is especially true for the roads infrastructure and to some extent for the water supply and electric power infrastructures. Although, in comparison with the European and former USSR countries, Moldova is not the last in this area, however, the general assessment of the infrastructure quality places the country among worst performers as to the infrastructure quality (Figure 18). The last is assessed based on infrastructure indicators of the EBRD¹² on a scale from 1 to 4.3 with reference to electric power, railways, roads, telecommunications and water supply and sewerage services.

Figure 18. Infrastructure quality



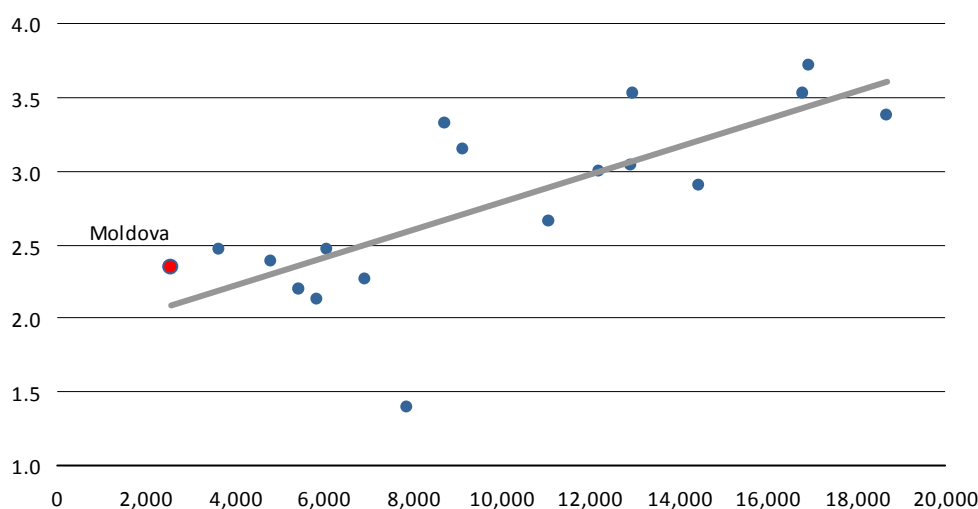
Source: EBRD, *Transition Reports 2003 – 2007, Infrastructure transition indicators*.

Taking into account the fact that more developed countries have got generally more developed infrastructure, and the quality of the latter relies to some extent on the country GDP level, it is important to consider the infrastructure status versus the country income. In this context, a regression based on the level of GDP

¹² The EBRD indicators evaluate the status of considered infrastructures in the light of existence of independent regulatory institutions, the Government interference in their activity, the adequate tariff policy, private sector involvement, organizational structures, activity planning and resources provision etc. A detailed description of the EBRD infrastructure indicators is available in the Transition report 2006, EBRD.

indicates that the Moldovan infrastructure in general is adequate to the current country GDP because the country position is over the regression line (Figure 19).

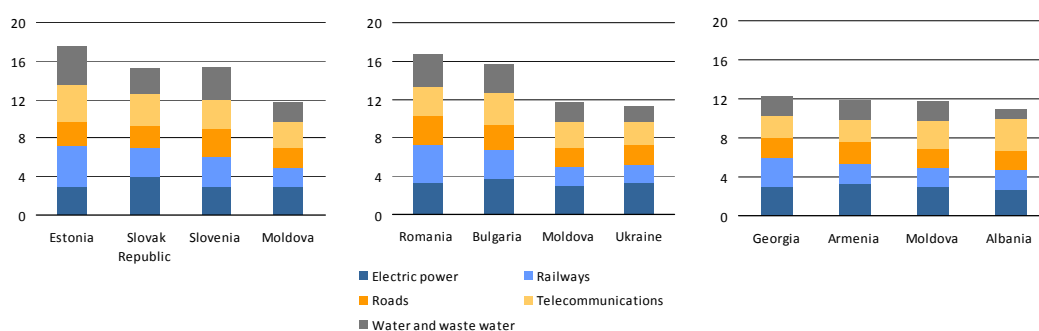
Figure 19. Infrastructure general quality versus GDP per capita, PPP, USD¹³



Source: EBRD, Transition Reports 2003 – 2007, Infrastructure transition indicators.

However, at a closer look in comparison with the target-countries, with countries with similar income level, and with those from close proximity (Figure 20), confirms the conclusion about the reduced quality of the Moldovan infrastructure.

Figure 20. Infrastructure quality in comparison with the categories of selected countries (target-countries, neighbor countries, countries with comparable income)



Source: EBRD, Transition Reports 2003 – 2007, Infrastructure transition indicators.

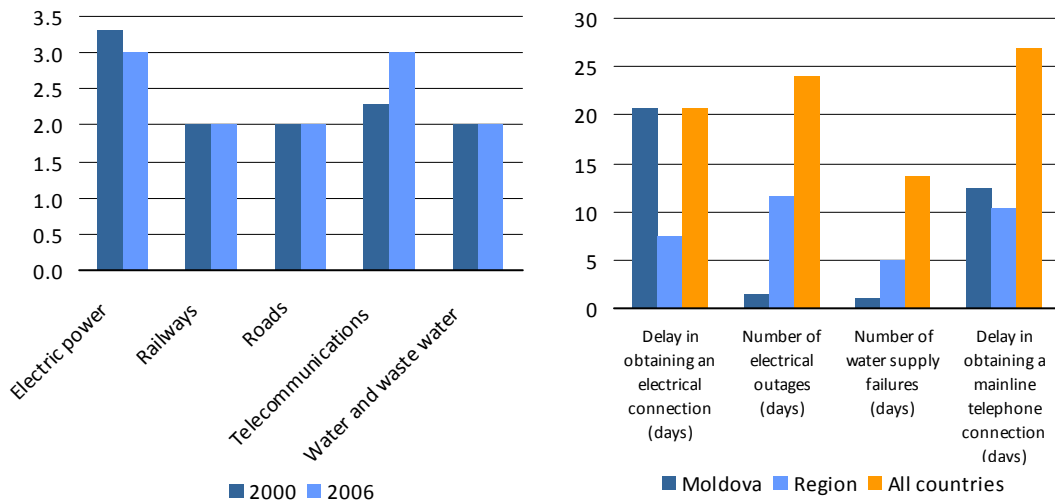
Based on EBRD analysis (2000), the Moldovan electric power and telecommunication infrastructures are much more qualitative than the railways, roads and water supply infrastructures (Figure 21). In fact, compared to 2000, the situation in the power engineering area in 2006 worsened a little bit, while the quality of telecommunications infrastructure improved substantially.

In this context, it is noteworthy that in another survey, conducted by the World Bank on constraints to enterprise development, the Moldovan companies do not complain about safe electric power and water supply services. Problems emerge in

¹³ In order to get a more representative picture, some additional countries from the Eastern Europe and CIS (Azerbaijan, Bosnia Herzegovina, Croatia, Czech Republic, Belarus, Hungary, Poland and Russia) have been included along with the countries of reference (Albania, Armenia, Georgia, Kyrgyzstan, Macedonia, Estonia, Latvia, Lithuania, Romania, Bulgaria and Ukraine).

obtaining connection to electric power grid or telecommunication network (Figure 21).

Figure 21. Quality of infrastructure components¹⁴ in 2000 and 2006 and constraints pointed out by businesses¹⁵



Source: EBRD, *Transition Reports 2003 – 2007, Infrastructure transition indicators*; World Bank, *Enterprise Survey, 2005*.

5.2 Telecommunications Infrastructure

In providing a general description of the **telecommunications infrastructure**, it is worth mentioning that it comprises today more than 1,000,000 of installed fixed-line telephone stations, or a penetration rate of over 290 stations per 1,000 inhabitants. Out of the total number of fixed-line stations, the digital ones represent circa 65%. One of the conditions that contributed to the telecommunication sector development is the substantial increase of the number of personal computers bought by the Moldovans. According to some estimates¹⁶, annually in Moldova over 50,000 new computers are installed and circa 1% of families have got a computer. The most recent available data¹⁷ show that at present in Moldova there are over 25 active Internet service providers of fixed-line telephony. The penetration rate for accessing the Internet is circa 20%, while that of mobile telephone system reached the penetration level of 41.31% in May 2007 with circa 1.42 million users.

Currently, the legislation in the field of telecommunications establishes the requirements towards the operator's activity, technical conditions, licensing

¹⁴ The infrastructure components are evaluated here by using a 1 to 4.3 scale according to the BERD methodology.

¹⁵ The considered indicators are related to time of delay for getting a connection to the electric power network in days; the number of days of electrical outages; the number of days of water supply failures; and the delay (days) for getting a mainline telephone connection.

¹⁶ These estimates are based on a study carried out by MIEPO in the sector of information services.

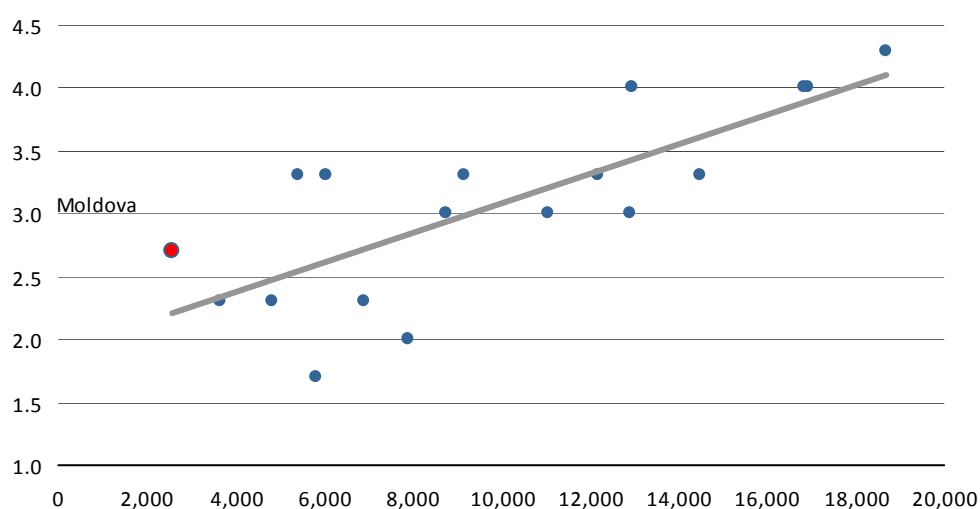
¹⁷ Data obtained from the ANRTI.

conditions and other aspects for rendering telecommunication services. The legislation also stipulates that the Ministry of Information Technology Development is the public authority that implements the Government policy in the field of information technology services, including the telecommunication services, and determines their development strategy. Concomitantly, the National Regulatory Agency for Telecommunications and Information Technologies (ANRTI) is the authority that regulates activities in the field of information technology services. Thus, the Ministry of Information Technology Development focuses on issues related to general management of information technology services, from the other side, ANRTI, which is considered as an independent body to regulate the information technology area, is responsible for the compliance of participants to the information technology service market with the legislative requirements, including those related to licensing.

Altogether, the total volume of sector revenues as percentage of GDP is around 11% (2006), which includes proceeds from services of fixed-line telephony both traditional and through the IP infrastructure, services of mobile telephony GSM and CDMA, pre-paid services of international conversations through the IP network, access to the Internet through dial-up and wide band in ADSL standard and by cable, and other information technology services as well. By the total volume of the information technology market, over 51% belong to services of fixed-line telephony, approximately 37% - to mobile telephony, circa 4% - to Internet and data conveyance services and the other circa 7% are split among cable and air TV, radio and other information technology services.

The largest participant to the market of IT services, especially to those related to services of fixed-line telephony, is the enterprise Moldtelecom – a state owned provider of telecommunication services. Moreover, starting with 2004, the telecommunication market has been liberalized in full, and the Internet service providers started to build up their own IP infrastructures to offer services of fixed-line telephony. However, the market share of alternative providers is estimated at 0.05% only.

Figure 22. Telecommunication Infrastructure versus PPP GDP per capita, USD



Source: EBRD, *Transition Reports 2003 – 2007, Infrastructure transition indicators.*

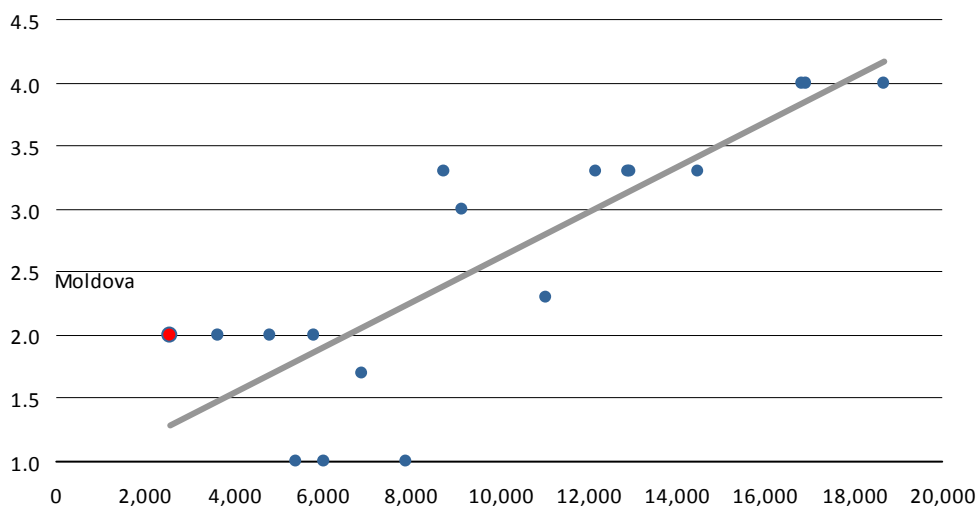
A totally different situation may be remarked in the field of mobile telephony. The development of this sector was started by the launch of a private service of mobile telephony in 1997. At present there are two operators/providers of mobile telephony of GSM standard, the third license has been granted to a company with Russian capital, which is planning to launch its service within the next several months. In addition to them, in March 2007 Moldtelecom launched its service of mobile telephony of CDMA standard that is available across the country.

Taking into account the aforementioned, and the regression over GDP (Figure 22), it is possible to conclude that the telecommunication sector in Moldova is developed adequately, which is less true for “wireless” technologies for data conveyance, the latter being still underdeveloped; for instance, such services as WiFi and WiMax are insufficiently available even in Chisinau – the country Capital.

5.3 Water Supply Infrastructure

The water supply infrastructure, in its turn, is characterized by poor quality and reduced safety of water supply and sewerage services. However, in those places where such services are available, the Moldovan companies complain less often than those from the region (Figure 21). Circa 80% of urban inhabitants are connected to centralized networks of water supply and 63% - to water sewerage systems. In the rural area and small towns the coverage with water supply services is approximately 60% and about 35% - with water sewerage services¹⁸. Taking into consideration the country GDP, we can draw the conclusion that the water supply infrastructure is not a binding constraint (Figure 23).

Figure 23. Water Supply Infrastructure versus PPP GDP per capita, USD



Source: EBRD, *Transition Reports 2003 – 2007, Infrastructure transition indicators*.

However, we have to mention that the water sewerage networks and those of residual water treatment have a limited capacity and have been deteriorated after a long period of weak or even lack of maintenance works. The quality of water

¹⁸ Data obtained from the Agency of Construction and Territorial Development.

supplied to consumers is of poor quality in general, and the service is considered as intermittent.

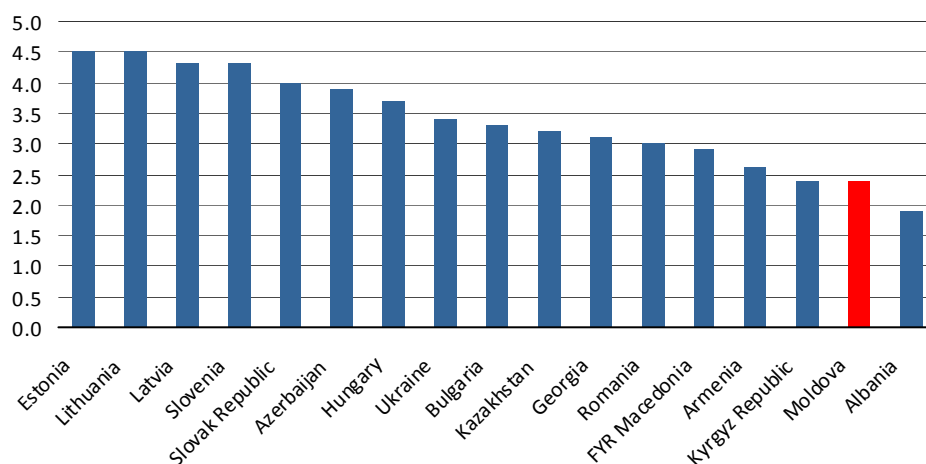
The Agency for Constructions and Territorial Development (ACTD) is the central authority responsible for developing and promoting the state policy in the field of water supply and water waste management. As for villages and small towns the water supply and sewerage networks are operated by semi-autonomous institutions (Apă Canal), which are accountable to the local public administration bodies.

In general, investments in stations for residual water treatment are far behind the needs because initially the target was to rehabilitate the water supply existing systems in order to make the water production and consumption more efficient. Other key-issues of this sector to be emphasized are related to reduced capacities of Apă Canal institutions to collected proceeds sufficient to cover adequately the operational and maintenance costs, without mentioning investments, procedures for establishing excessively politicized tariffs and regulatory issues.

5.4 Infrastructure of Terrestrial Transports

Another component of the infrastructure of the Republic of Moldova, i.e. the **Infrastructure of terrestrial transports**, is, probably, the component that currently needs utmost attention. According to the classification developed by the World Economic Forum, in terms of quality of the infrastructure of terrestrial means of transport, Moldova has been placed almost at the end, exceeding Albania only (Figure 24).

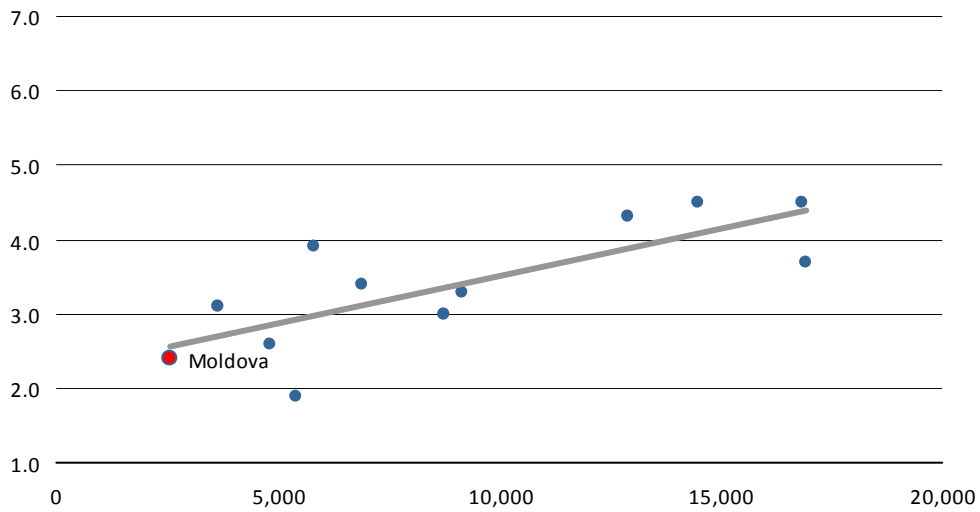
Figure 24. Classification of the infrastructure of terrestrial means of transport, Scale 1 (inadequate) – 7 (adequate)



Source: World Economic Forum, WEF Rating, 2006

The regression versus GDP (Figure 25) amplifies the „feeling” that the infrastructure of terrestrial means of transport is inadequate because Moldova is positioned under the regression average line.

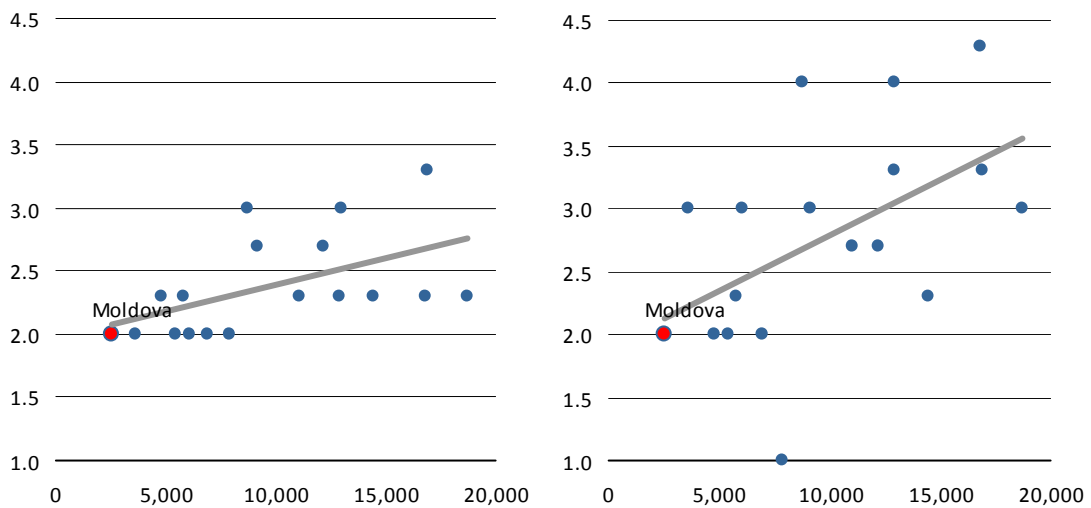
Figure 25. Infrastructure of terrestrial means of transport versus GDP per capita, PPP, 2005, USD.



Source: World Economic Forum, WEF Rating, 2006

Computations performed based on the EBRD evaluation in the Transition Indicators reports confirm the same thing – even if considered separately, both components of the infrastructure of terrestrial means of transport, both the roads and the railways, are situated under the regression lines (Figure 26).

Figure 26. Infrastructure of roads and railways versus GDP per capita at PPP, USD

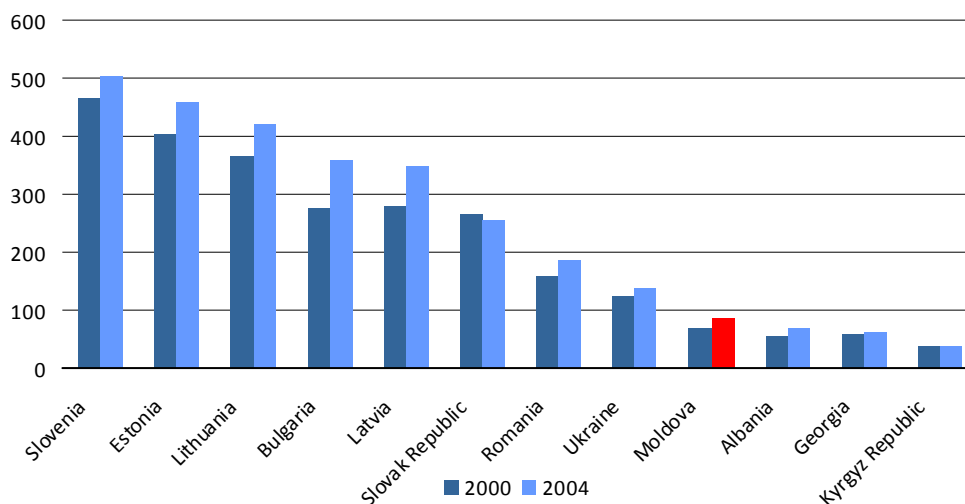


Source: EBRD, Transition Reports 2003 – 2007, Infrastructure transition indicators.

The importance of the Moldovan **road infrastructure** is conditioned by the fact that due to its geographical position, the country may be considered as the gate between the CIS members and Western Europe. This assumption is even more accurate in case we take account of commercial contacts, spoken languages and the culture of this region of Europe. Since Moldova today is a border country with the European Union and with other countries situated to the East, the Pan European IX Corridor (Moscow – Kiev – Chisinau – Bucharest) that crosses the country from East to West, for sure gets more importance both at the national and international levels.

However, keeping in mind the status of the Moldovan road network, it seems that the newly emerged opportunities could be lost, and the country would not be able to benefit from them properly due to its infrastructure of deteriorated means of transport, and, especially, due to its out-of-date road network.

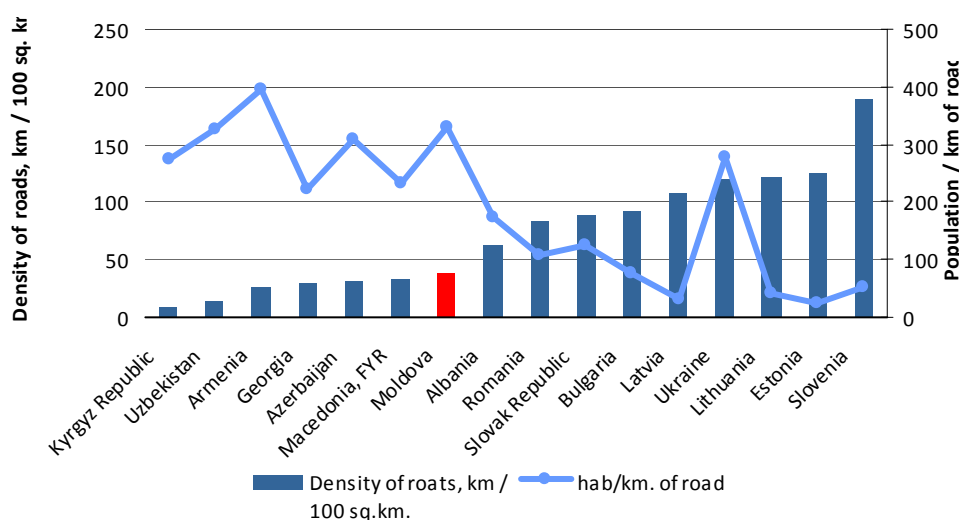
Figure 27. Motor Vehicles (per 1,000 inhabitants)



Source: World Development Indicators, WB, 2005

According to the available data¹⁹, the total length of the road network in Moldova is approximately 16,800 km, out of which 3,600 km are classified as national roads, and the remainder – as local roads. Taking into account the country size, its population, and the number of vehicles per 1,000 inhabitants (Figure 27), the size of the road network could be considered as adequate, without any need to expand it substantially at present.

Figure 28. Density of roads and the number of inhabitants per 1 km of roads



Source: Authors' computations based on the World Development Indicators, WB, WDI 2004.

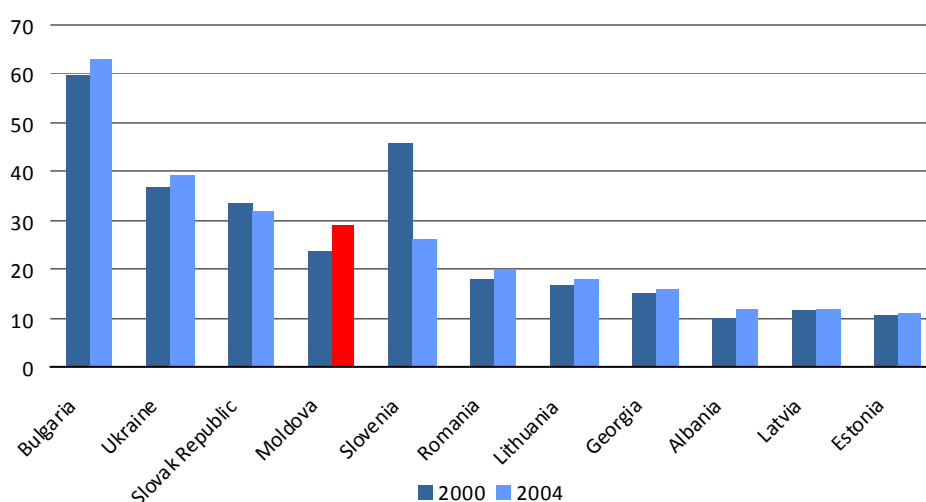
However, the situation may change in the future. If in terms of the density of roads per 100 sq. km the situation seems to be acceptable, but taking into consideration

¹⁹ Data obtained from the Ministry of Transportations and Roads.

the number of inhabitants per one km of roads (Figure 28), we could draw the conclusion that along with the economic development, enhancement of population welfare and increase of the number of cars, the Moldovan roads could become “rather” congested in the not so far away future.

In fact, even in case of considering the number of cars per one km of roads in 2004, the Republic of Moldova was already among the top reference countries in the relevant period, having registered a more evident growth of circulation density versus other countries in comparison with the situation from 2000 (Figure 29).

Figure 29. Motor Vehicles per 1 km of roads



Source: World Development Indicators, WB, 2005

However, in terms of road infrastructure, it seems that the major problem is the quality itself of the existing network. In a Study conducted by the World Bank it has been mentioned that if the Moldovan road network would have benefited from proper maintenance works, its asset value would be about 12 billion USD²⁰. Along with that, despite the fact that circa 90% of all roads are paved, according to an assessment conducted in 2001, more than 67 % of national roads and over 75% of local roads are considered to be in poor condition. The latest evaluations²¹ reveal that the proportion of roads in poor and very poor condition is getting close to 100% (Figure 30).

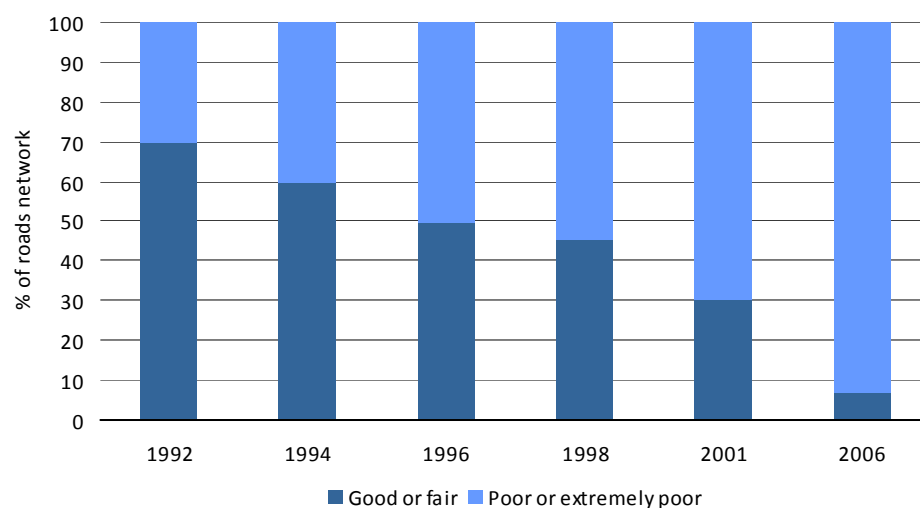
This is the direct result of long-term negligence towards the roads within the last 15 years, in the course of which few resources have been spent for road rehabilitation and maintenance. About 400 km of roads that were asphalted some time ago, have lost the asphalt layer and have been transformed into roads paved with gravel or even unpaved. The current asset value of the road network is estimated at only 8.4 billion USD versus 12 billion USD in case the network would

²⁰ An assessment of the national road network asset value was conducted as part of the World Bank Report WB 2006 Public Expenditure Review.

²¹ The latest evaluation of the country road network status was conducted in December 2006 – February 2007 within the WB support for preparing the Transport Sector Strategy of the Republic of Moldova.

have been maintained in a proper condition. The loss of asset value due to inadequate maintenance and rehabilitation is estimated at 3.6 billion USD, which is a significant amount, if we take into account the country GDP for 2006, which is only close to this figure.

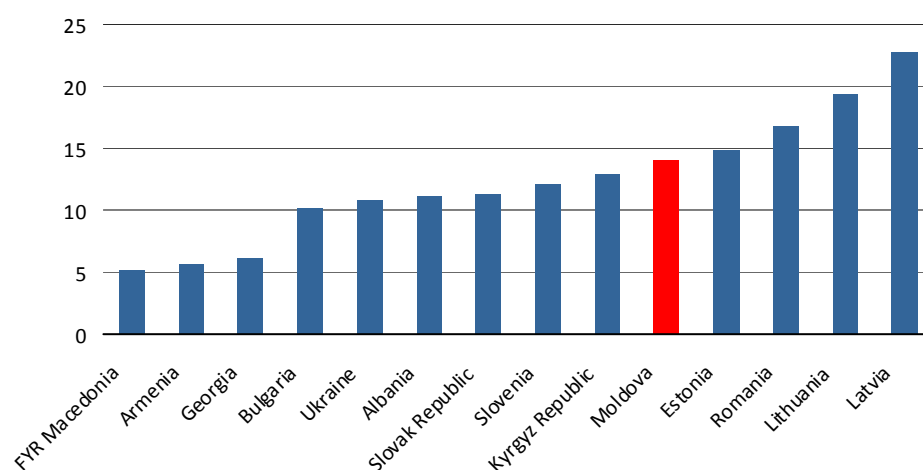
Figure 30. Evolution of the Moldovan road network status



Source: The World Bank 2006 Report on Public Expenditure Review, Transport Chapter.

In a series of studies conducted previously²², it is shown that just the vehicle operation costs on roads of poor quality are by circa 30% higher versus the situation when they circulate on good roads. This figure does not include the losses associated with the increased number of accidents due to poor road condition, which are also quite large (Figure 31) even in comparison with countries that have more cars per 1,000 inhabitants (Figure 27).

Figure 31. Mortality caused by road accidents, cases per 100,000 of population, 1998 – 2003

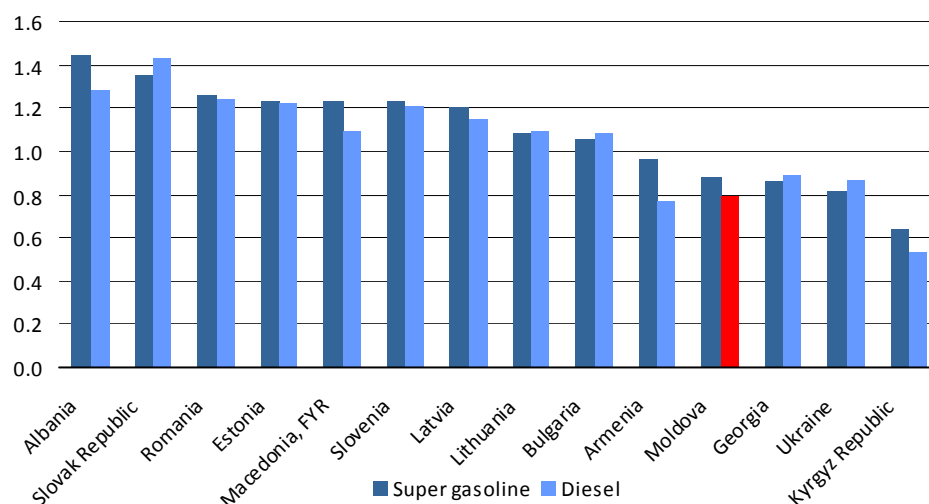


Source: World Development Indicators, World Bank, 2007

²² Studies conducted in 1994, 1998 and 2001 with the EBRD support show an essential increase of vehicle operating costs in the conditions of circulation on poor maintained roads.

In terms of vehicle operating costs, the most recent studies²³ show that, in fact, depending on the vehicle type and the road status on which the vehicle is exploited, the losses may vary from 9.7 and 2.2 US cents per one run km, while the cumulative losses incurred by all users of national roads during 1997 – 2006 amounted 1.8 billion US Dollars.

Figure 32. Prices for gasoline and Diesel oil in 2006, USD per liter



Source: World Development Indicators, WB, 2007.

At present, with the support of the World Bank, a strategic policy paper is being developed that would address the issues related to maintenance and rehabilitation of the national road network, including the finance needs and establishing a transparent system for collecting the necessary financial resources. Keeping in mind the low price for gasoline and diesel oil in comparison with the countries from the region (Figure 32), a potential price increase by levying a relatively small fee per liter of fuel would reduce the problem of financing the maintenance of the Moldovan road network.

The aforementioned strategic paper points out that the most important reforms in the road sector would be those related to the establishment of a reliable and stable mechanism for financing the road maintenance, reforming the approach towards road maintenance and introducing a system for checking the weight on axle in order to reduce the circulation of overloaded trucks on the country roads.

5.5 Energy Infrastructure

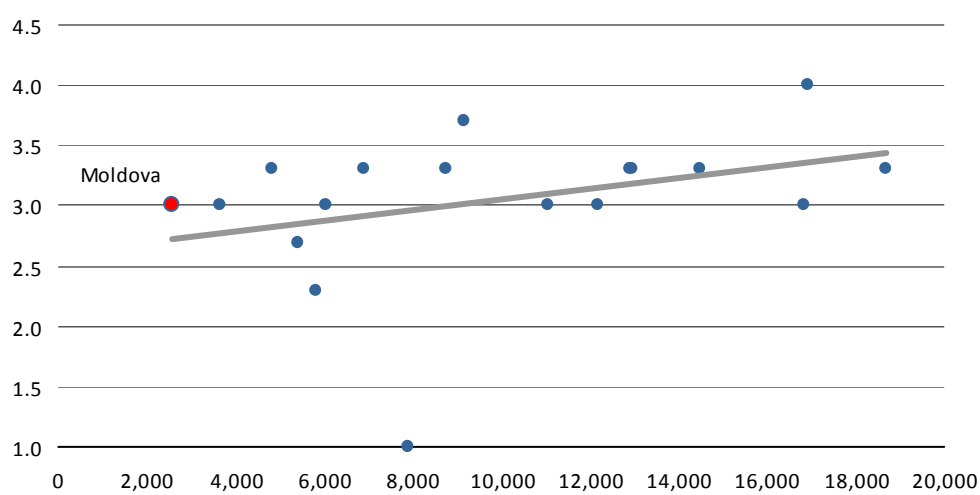
The Energy Sector in general, and its branches of electric power **generation and distribution** in particular, is considered as one of the main sectors of the Moldovan economy, which, to some extent, determines the success in implementing the national development programs and economic stability in general. Access to electric power is granted across the country regardless of the settlement. The electric power represents about 23% of the total energy consumption. The

²³ The WB 2006 Report on Public Expenditure Review, Transport Chapter.

residential sector consumes circa 39%, being followed by the trade and public sectors with 29% and by industry with 23%.

In comparison with the Road and Water Supply and Sewerage Infrastructures, the Power Generation Infrastructure seems to be in a slightly more favorable situation. This conclusion is confirmed by the regression versus GDP per capita (Figure 33), which places the status of power engineering above the average regression line, which means at first glance that the Power Engineering Infrastructure, even if it is a constraint, the latter is not a binding constraint.

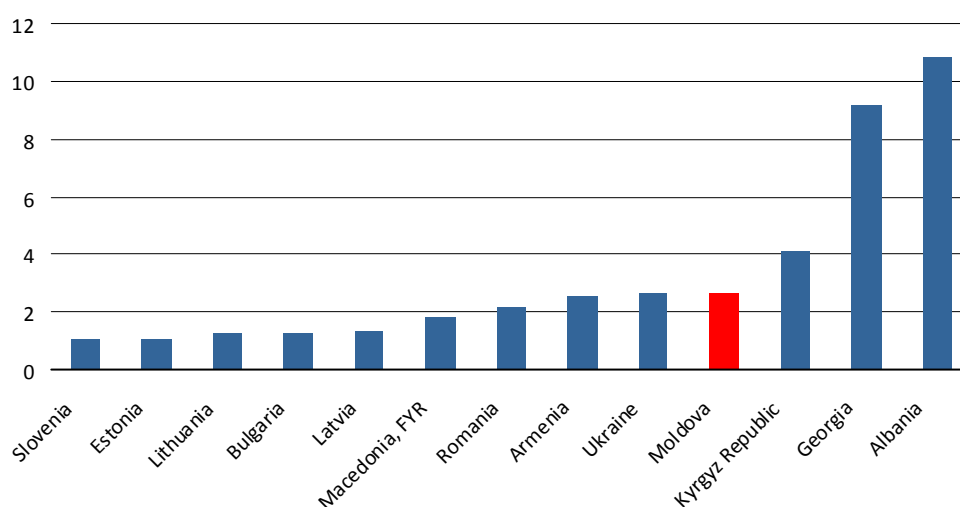
Figure 33 Electric Power Supply Infrastructure versus GDP per capita at PPP, USD.



Source: EBRD, *Infrastructure Transition Indicators*, 2006

Even the lost value of sales due to deficiencies in electric power supply does not indicate something outstanding, Moldova being placed among the countries with the lowest losses in this respect (Figure 34).

Figure 34 The lost value due to deficiencies in electric power supply, % from sales.

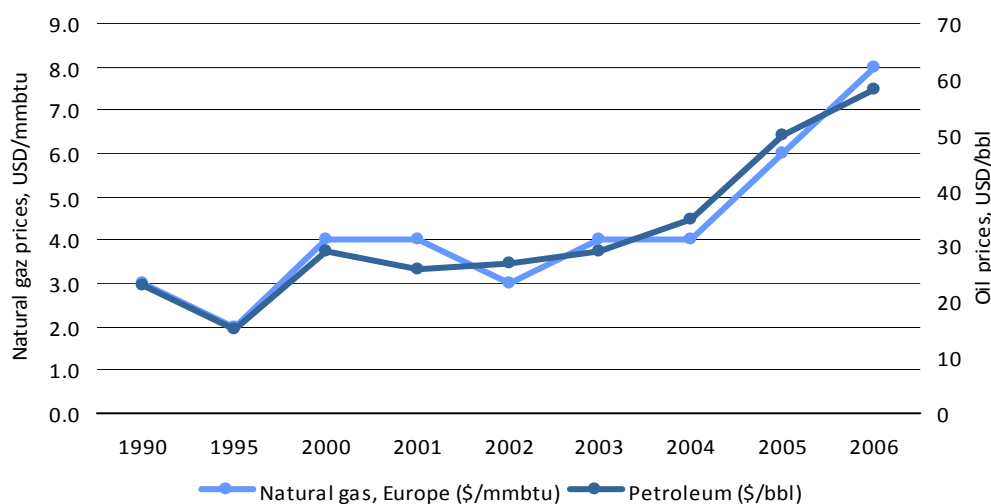


Source: Enterprise Survey, WB, 2005

However, the current situation in the power generating sector of the Republic of Moldova is not pretty stable yet and it could worsen in the future. In this context it

is noteworthy that Moldova derives the electric power from two sources. The first source is represented mainly by three stations with heating systems that work on natural gas. These stations co-generate approximately 30% of the domestic consumption of electric power in the process of production of thermal energy for Chisinau and Balti.

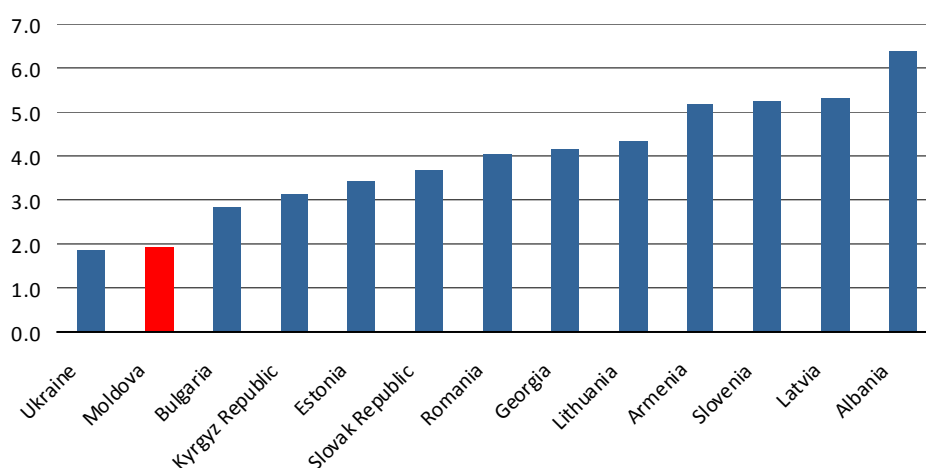
Figure 35. Average prices for petroleum and natural gas on the European markets.



Source: World Development Indicators, WB, 2007

The second source is represented by the imports from Ukraine that cover 70% of the energy consumed. In the past, a significant part of the country electric power needs was covered by the Electric Station from Cuciurgan²⁴, which currently does not supply electric power to the right bank of Nistru River.

Figure 36. GDP per one unit of energy used (2000 PPP USD/ kg oil equivalent)



Source: World Development Indicators, WB, 2005

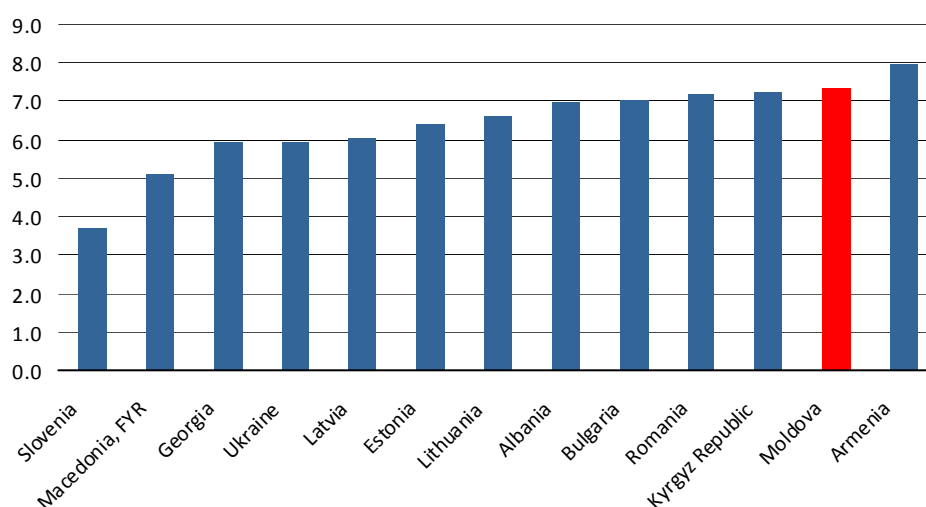
Due to the fact that the Moldovan electric power generating facilities use natural gas only, which price increased more than twice starting from 2006, on the

²⁴ The Station from Cuciurgan is the largest in the region, located on the left bank of Nistru River, and currently is not under the control of Moldovan authorities.

background of augmentation of prices for oil and natural gas on the international markets (Figure 35), and in the next couple of years prices may go up even more, the price for electric power will grow for sure.

Certainly, the energy price increase may reduce from competitiveness of Moldovan enterprises because the energy in Moldova is used inefficiently at present, which is confirmed by the volume of GDP obtained per one unit of energy used (Figure 36), which shows an alarming high level consumption of energy. The same alarming situation is confirmed by the energy consumption as a proportion of sales (Figure 37).

Figure 37. Energy consumption, % of sales

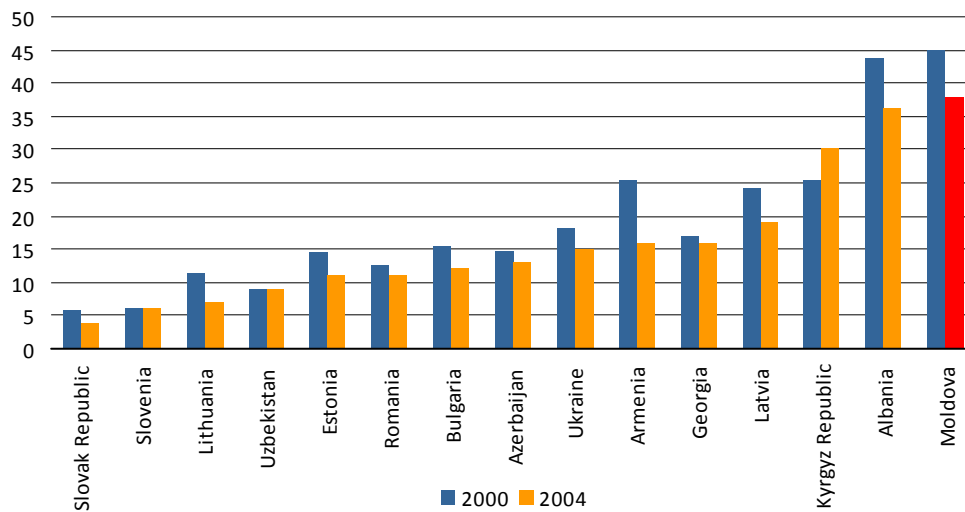


Source: Enterprise Survey index, WB, 2005.

The arrangements for electric power imports from Ukraine may have positive implications in terms of vulnerability to the price level of electric power. Even if we take into account the fact that this agreement is valid until the end of 2007, and the price for electric power will grow, it is noteworthy that the electric power from Ukraine is a mixture of energy generated by nuclear stations (45%), by stations that use natural gas (31%); by stations that use coal (18%) and by stations that use other sources (6%). As a result, the price per electric power should be less sensitive to changes in prices for natural gas, and the Moldovan companies might benefit to some extent from relatively smaller prices for electric power. A constraint here could be the weak capacity to interconnect the Moldovan and Ukrainian electric power grids.

In any case, the issue of elevated consumption of energy does not cause major competitive disadvantages as long as Moldova benefits from reduced prices for energy. However, taking into account the worldwide upward trend of prices for energy resources (electric power inclusive), it could be the case that in the nearest future the country will confront with an important problem aggravated by the losses incurred while transporting and distributing the electric power. According to the World Development Indicators (Figure 38), Moldova ranks the first in terms of electric power losses in the course of its transportation and distribution with over 35% in 2004.

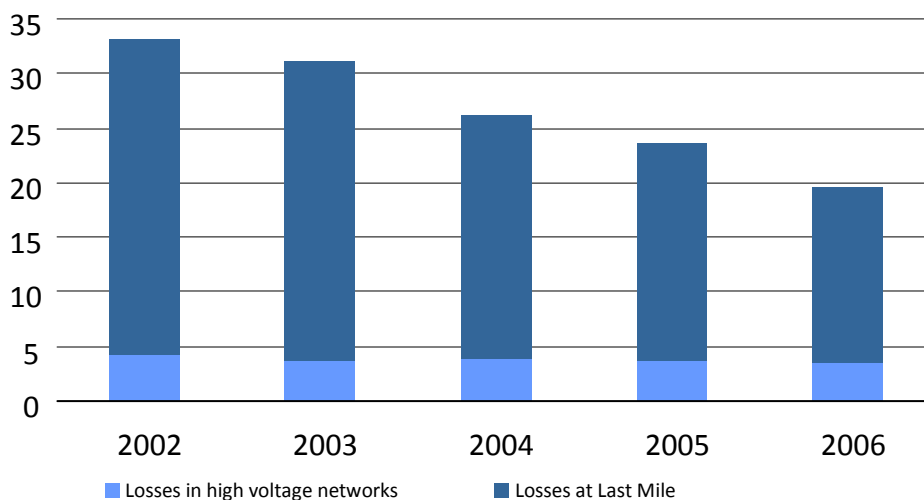
Figure 38. Losses of electric power in the course of its transportation and distribution, % of obtained energy



Source: World Development Indicators, WB, 2005

Data retrieved from the National Energy Regulatory Agency (ANRE) show actually a smaller percent of losses in comparison with the World Development Indicators (Figure 39). But taking into account the volume of losses of over 25% recorded in 2004, this fact does not change radically the position of Moldova versus the countries selected for analysis. However, it seems that largest losses are recorded at the distribution stage, and the distribution companies try to undertake specific measures to mitigate these losses.

Figure 39. Losses of electric power in the course of its transportation and distribution according to the ANRE data, % of obtained energy



Source: National Energy Regulatory Agency, 2007

In conclusion, we can mention that the situation in the Moldovan energy sector is characterized by a quasi-total dependence (approximately 97%) from imports of primary energy resources and reduced availability of import sources for electric power and natural gas. The limited capacities of domestic facilities to generate electric power (30% from the needs only) on the right bank of Nistru River and

weak capacities to interconnect the Moldovan energy system with the European systems represent another issue. We have to mention here that, according to the field-related expert opinions, even the structure of the existing grid for transporting the electric power does not correspond to requirements for ensuring the country energy security.

In the same context, limited investments in energy sector rehabilitation and development led to an advanced physical depreciation of the sector equipment: approximately 60% of equipment is used for an over 30-year period and 40% of equipment is used during more than 40 years. This situation conducts to a reduced quality of electric power supply services as well as to enhanced losses in the course of energy transportation and distribution, and ultimately, to low sector efficiency.

During the past several years, the Government has undertaken actions aimed at reforming the energy sector by developing and adopting decisions aimed at sector de-monopolization and decentralization, and promotion of competition by attracting and encouraging private investments on the energy market and improving the energy and economic efficiency. In spite of the carried out efforts, the situation in the energy sector continues to remain tense. It is envisaged that the current situation may be addressed through continuing the economic reform in the energy complex and expanding the relations with the external energy markets.

With respect to the quality of the infrastructure in general, based on the performed Analysis, one can draw the conclusion that the telecommunication sector has got fewest problems (Table 2). The electric power and water supply and sewerage infrastructures, although they need attention in terms of investments and services quality, it seems that they do not represent binding constraints to business development, at least now. And finally, the road infrastructure seems to be the area mostly affected by the shortage of investments, which affects both the population and business development, especially in the regions.

Table 2. Assessment of Infrastructure Components of the Republic of Moldova

Infrastructure	Status ²⁵
Telecommunications	+
Water Supply and Sewerage Services	+ / -
Roads	-
Electric power	+ / -

Although the Moldovan companies do not complain too much about the infrastructure constraints, it seems that the companies have been established mostly in those areas where the infrastructure is not an issue; for instance, more than 50% of all Moldovan companies are established in Chisinau and their contribution to the country GDP exceeds 50%. The clusters of companies in Chisinau boost up prices for the production factors (e.g. human resources and immovable properties) in the Capital in comparison with the rest of the country.

²⁵ "+" – good conditions; "+/-" – relatively poor conditions but currently do not represent a binding constraint; "-" – poor conditions that could represent a binding constraint;

One conclusion in this context would be that the road deteriorated infrastructure mitigates the labor force mobility. And the price discrepancy for the production factors is an implicit indicator of regional gaps in availability of infrastructure components.

6 Innovations and Competitiveness

„Moldovan companies do not innovate” and „Moldovan products are not competitive” are two of the most widely circulated statements with respect to the Moldovan economy. Indeed, the Moldovan wines have not penetrated extensively to the Western markets, while the domestic consumers from Chisinau have noticed the substitution of endogenous juices and drinks with products from Ukraine and Turkey.

Such casual remarks are related to traditional highly visible products. At the same time, it could be true that the comparative advantage of Moldova is in new export-oriented products, which are not intended for final consumption. The progress in such innovations is less visible from the ordinary consumer’s point of view.

6.1 Conceptualization and Data

From the growth point of view, the role of technological advance consists in introducing new products and enhancing the quality of the nomenclature of current products. This process occurs differently depending on country position vis-à-vis the technological frontier:

- Countries on the frontier (with high tech) design new products and establish new quality/performance standards; and
- Countries below the frontier, which have out-of-date production technologies, reduce the distance between the country technological level and the world technological scope/edge through technological imitation and adjustment of the existing products and tech.

Regardless of the country position versus the technological frontier, **the real technological advance results in enlarging the list of goods produced by the country (sophistication)** and enhancing the quality of the existing products. Records about the number of produced goods are not available, but there are data about the number of exported goods. Focusing on exports provides an additional benefit – the exported goods are competitive by definition, or correspond to minimum quality standards.

Let us estimate the Moldovan economy innovation capacity and innovational performance through:

- Evolution of the export sophisticated level and cross-country performance comparison in this area;
- Comparative performance in registration of patents of inventions as a measure of R&D;

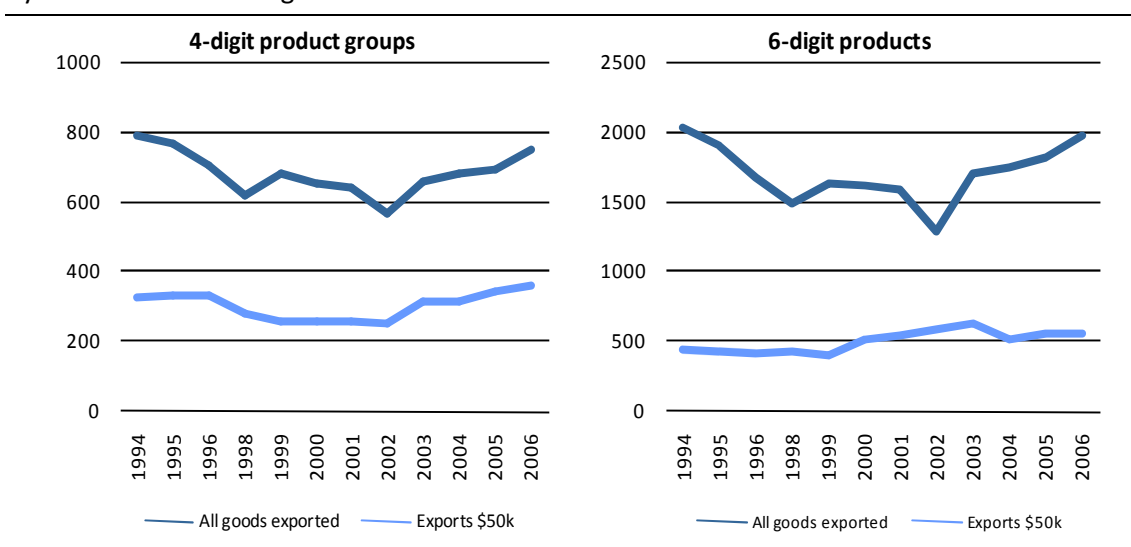
- Comparative performance in adopting innovations at the enterprise level.

In order to assess the export sophistication we will use the ComTrade database²⁶, compiled by the UN with products grouped according to the *Harmonized System* classification up to four digits (groups of products) and six digits (products).

6.2 The Export Basket Size and Composition

Lately, Moldova has recorded evident increase in the number of exported goods: from 653 products in 2000 to 751 in 2006, which is a 15% upgrowth. This evolution is represented by the left panel of Figure 40. On the same panel one can see that the number of export goods totaling over 50 thousand USD (adjusted to dollar inflation) grew up even more: by 40%. The right panel displays the increase in the number of six-digit products according to the *Harmonized System*.

Figure 40. Evolution in the number of exported goods classified according to the Harmonized System four- and six-digit codes



Source: ComTrade and Authors' computations

Note: Data for 1997 are not reliable and have been eliminated from the Analysis.

These graphs show that currently the Moldovan export basket is slightly smaller than it was in 1994. Concomitantly, the noticeable increase in the number of exported goods during the last years may reveal a) discovery of new products, or b) mere resumption of exports of some traditional goods; the accurate answer may be found by analyzing the composition of the export basket.

Table 3 below displays just some overlaps in the top ten Moldovan exports carried out in 1994 and 2006. Obviously, only two types of goods are comprised by both lists; hence the Moldovan export basket has suffered some major structural changes in the course of the past decade. This notification supports the hypothesis that the recent growth in the number of exported goods reveals the introduction of production innovations.

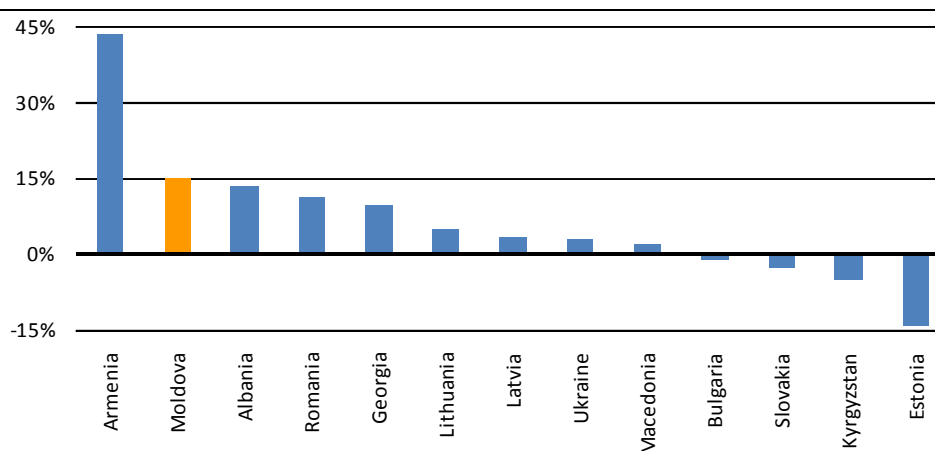
²⁶ ComTrade, UN. <http://www.comtrade.un.org>. Requires subscription.

Table 3. The Moldovan top ten exports in 1994 and 2006, four-digits

#	1994			2006		
	Code	Description	Value, thousand USD	Code	Description	Value, thousand USD
1	2204	Grape wines, including wines fortified with alcohol; grape stum/must	62,280	2204	Grape wines, including wines fortified with alcohol; grape stum/must	161,081
2	2208	Undenaturated ethyl alcohol under 80%	33,456	0802	Other peel fruits, nuts, fresh or dried, shelled or peeled	37,479
3	1701	Solid cane or beet sugar and chemically pure sucrose	30,975	6203	Men' suits or ensembles	34,395
4	1005	Maize (corn)	30,974	1512	Sunflower oil	32,027
5	0806	Grapes, fresh or dried	23,969	6204	Women' ensembles, jackets, dresses, skirts, and trousers	31,931
6	0808	Apples, pears and quinces, fresh	23,885	6109	T-shirts and singlets, knitted or crocheted	27,808
7	2009	Fruits and juices, non-fermented	21,380	7010	Glass bottles, flasks, jars, mugs etc.	27,666
8	0202	Beef, frozen	14,517	7213	Iron laminated bars and rods	24,942
9	2401	Unprocessed tobacco	14,081	2208	Undenaturated ethyl alcohol under 80%	23,242
10	8528	TV receivers	13,499	2520	Gypsum, anhydride	22,712

Source: ComTrade, UN

We can argue that the shrink in the number of exported goods in the course of 1994-2001 was a natural consequence of the Moldovan economy opening to the world, and, more important, the opening of economies of the main trade partners. Within the new conditions, a large part of the export basket did not match the country real comparative advantages and, therefore, was replaced. Subsequently, Moldova managed to introduce new products, which contravenes the widely spread affirmations that Moldova does not innovate.

Figure 41. Change in the number of exported goods, %, 2006 vs. 2000

Source: ComTrade and Authors' computations.

Figure 41 portrays the percentage evolution of the number of exported goods (2006 versus 2000) from Moldova and from other countries of the region. This

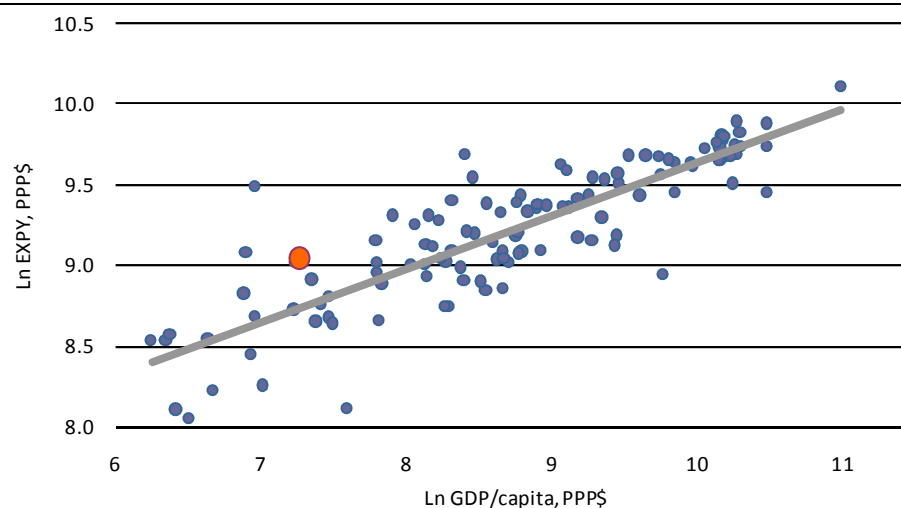
evolution sustains the preliminary conclusion that the Moldovan economy not only is able to discover new products, but also does it successfully in comparison with other countries from the region.

6.3 Exports Sophistication Level

At the same time, in order to analyze the sophistication level, it is necessary to turn from counting the export basket goods to their individual assessment. Therefore, we will use the index EXPY²⁷ to assess the sophistication level of the goods exported by a country. It is well-known that the developed countries focus on manufacturing more sophisticated goods, while the poor countries produce and export typical sets with less complex items. The EXPY index captures the complexity and sophistication of goods from the country export basket.

The Graph from Figure 42 ranks the exports sophistication indexes EXPY from over 150 countries versus GDP per capita from those countries (Moldova is highlighted in orange). First of all, we notice strong correlation between the GDP per capita and EXPY²⁸, which is due to the EXPY index structure. The position on the vertical line versus the regression line shows the relative sophistication of country exports. For instance, the value of EXPY for Moldova is 8,439 USD, which is far higher than the predicted level (6,300 USD) for a country with such a level of GDP per capita.

Figure 42. Correlation between GDP per capita and EXPY for the year of 2003



Source: Hausmann & Rodrik (2005)

The sophistication index EXPY for Moldova, which is abnormally high, means that the country export basket is more sophisticated than expected. However, it is logically to presume that such a performance is quite common for all economies in transition since they have high potential of human capital and industrial

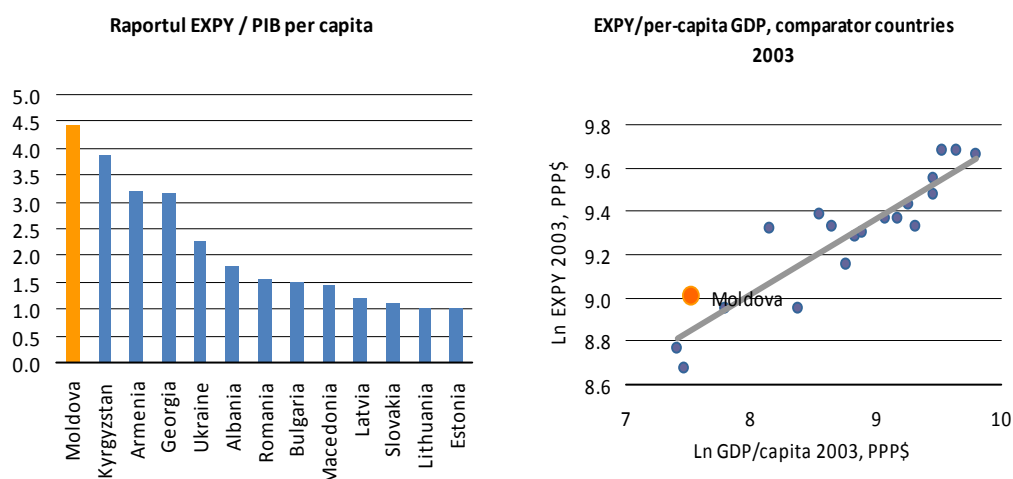
²⁷ Hausmann, Ricardo, Hwang, Jason and Dani Rodrik. 2005. "What You Export Matters". NBER Working Paper No. 11905. Available online at <http://www.nber.org/papers/w11905>. The October 2006 version available at <http://ksghome.harvard.edu/~drodrik/hhr.pdf>

²⁸ $R^2=73.3\%$

experience. Therefore, it is more appropriate to compare Moldova performance with other countries from the region.

Figure 43 below displays the same regression for the group of comparable countries only. The left panel shows that Moldova has got high EXPY/GDP per capita ratio in comparison with the other countries. The right panel refreshes the regression for the countries in transition only. We notice that Moldova is above the regression line again.

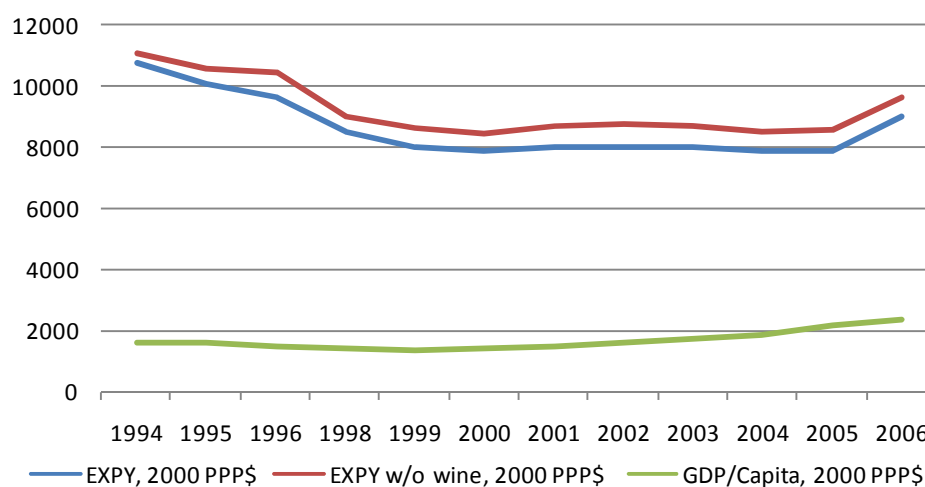
Figure 43. Sophistication of exports for countries in transition, 2003



Source: Hausmann & Rodrik (2005), ComTrade, the Author's computations.

A potential source of critique for having used the EXPY indicator for assessing the exports sophistication level results from the fact that the Moldovan basket of exported goods is prevailed by wine, which represents around 15% of the total exports. Worldwide, the wine is produced in the temperate zone of the Globe, dominated by rich countries.

Figure 44. Evolution of EXPY and GDP per capita for Moldova, years 1994-2006



Source: Data from ComTrade. Authors' computations based on the PRODY data from Hausmann & Rodrik (2005).

Note: Data for 1997 are not reliable and have been eliminated from the Analysis.

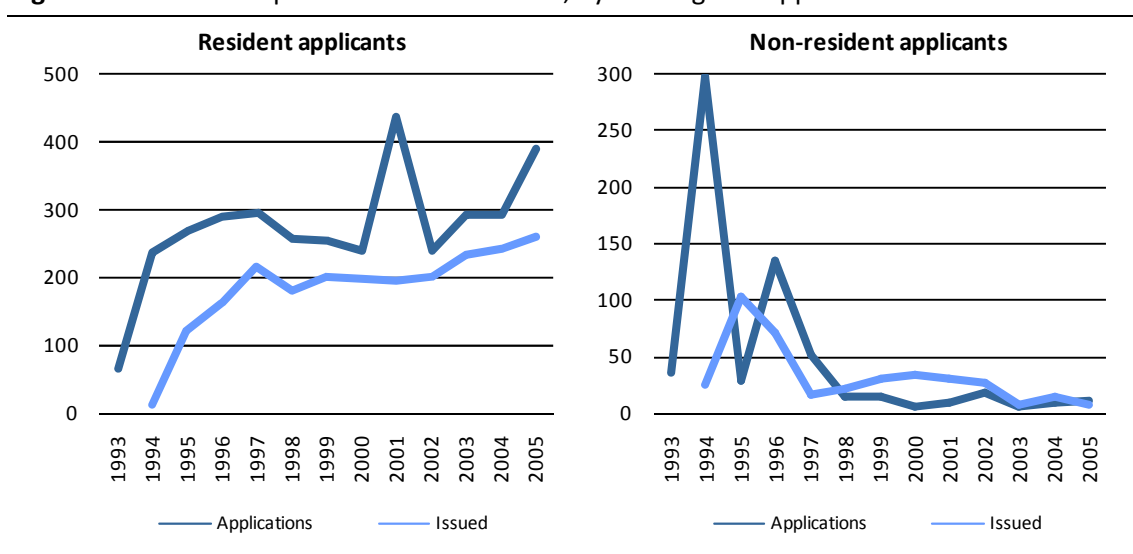
Figure 44 recomputed the EXPY for all Moldovan exports but wine. Contrary to expectations, the EXPY of this incomplete basket of exported goods is higher than the index for the full basket. We notice that the year of 2006 was specifically advantageous for the exports sophisticated level, which may be explained by the reallocation of investments from the winemaking sector to more sophisticated products.

6.4 Patents

The number of registered patents is much larger than expected from a country with such a size and development level as Moldova. The previous analysis was focused on the final outcomes of innovations. In addition, we can investigate the inputs of innovation, especially R&D.

Figure 45 shows the evolution of the number of requests for patents and the number of patents issued by the origin of applicants. The number of applications from residents has got a stable upward trend, while the number of applications from non-residents dropped substantially.

Figure 45. Number of patents filed in Moldova, by the origin of applicants



Source: AGEPI. <http://www.moldovanpatentoffice.org/english/statistics.html>

Since we consider specifically the domestic capacity to innovate, we will focus on applications filled out by residents. In order to assess the performance of Moldova on a global scale, we can use the following regression:

$$\ln Patents = A + B_1 \ln(GDP/capita) + B_2 \ln(Population) + B_3 TertiaryEnrollment + e$$

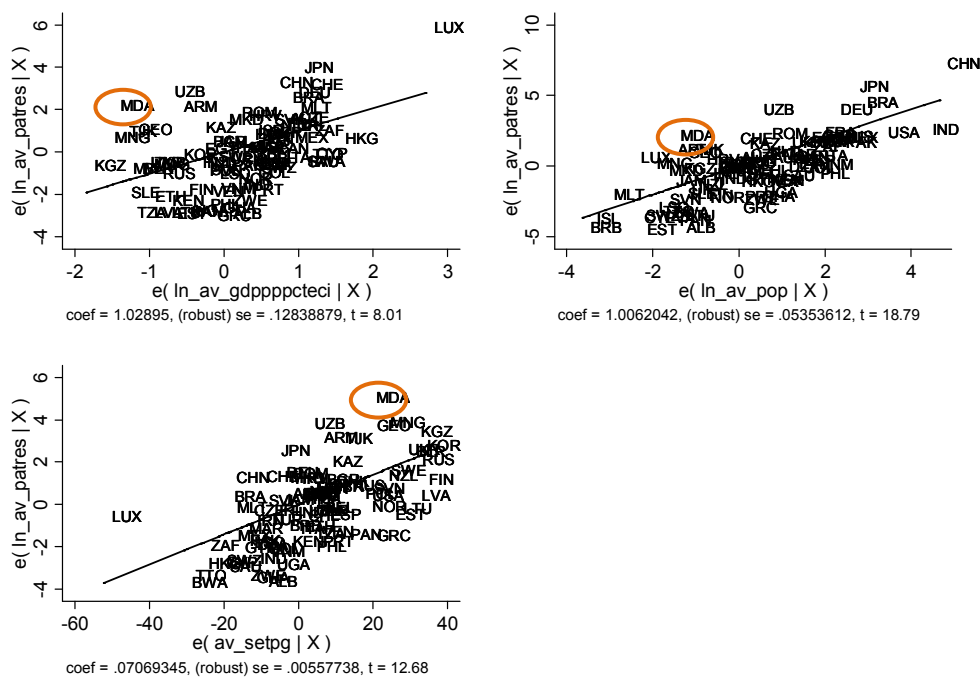
The exogenous parameters of this regression are GDP per capita, the number of population and the rate of higher education. The results are displayed in Table 4.

Table 4. Result of regression. Dependent Variable: number of patents per year

Variable	Coefficient	Standard Error	T-stat
Ln GDP/capita, PPP	1.029	0.1283888	8.01
Ln Population	1.006	0.0535361	18.79
Tertiary Enrollment	0.070	0.0055774	12.68
Constant	-22.958	1.461185	-15.71
R²=0.7998			

The Graphs below present the partial correlations for independent variables.

Figure 46. Partial correlation between the number of patents and the Regression of Independent Variables



Source: Authors' computations using the data from the World Development Indicators 2007, WB.

These graphs clearly show that the number of patents issued in Moldova exceeds essentially the expected patent level for a country with such GDP/capita, population, and tertiary enrollment. The regression predicts that the Moldovan residents should have filed for seven patents only; the actual number recorded in the course of 2000-2004 is circa 300, or 43 times more than expected.

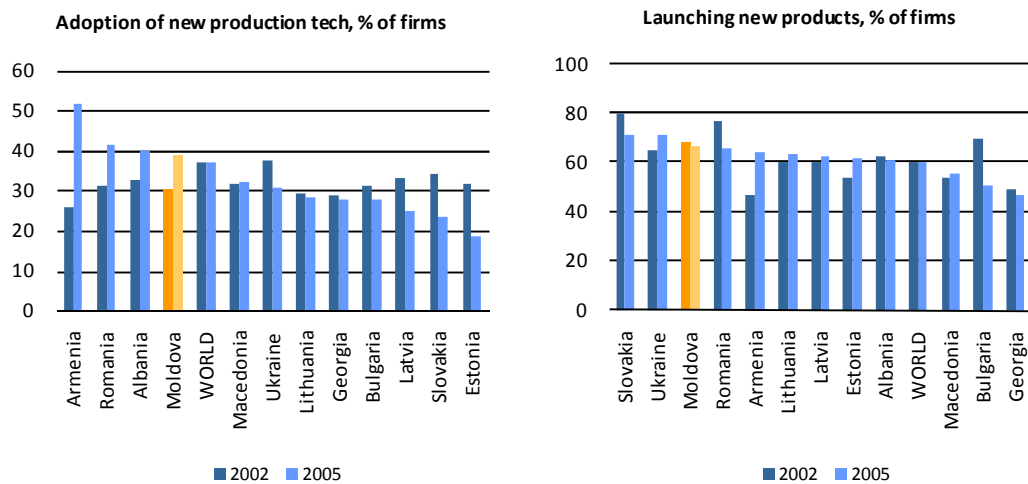
The issue about the Moldovan industry failure to absorb such a large number of patents can be tackled. Perhaps, the majority of these patents never result in marketable products, and the patents supply is driven by non-economic reasons, which, in fact, distract the researchers from being engaged in industry-relevant research²⁹.

²⁹ For example, the number of patents in some of the used criteria for evaluating the scholars who apply for the Moldovan Academy of Sciences membership.

6.5 Innovations at the Enterprise Level

The Moldovan enterprises are reaching the stage of intensified usage of technological advance. The capacity to acquire new skills/knowledge is just a pre-condition; a major importance belongs to the ability to introduce relevant changes in enterprise daily activities. Data collected by the „Doing Business 2006” Survey (over 300 Moldovan enterprises participated to this Survey) enable us to compare the Moldovan performance with other countries in terms of direct adoption of new products and technologies (Figure 47).

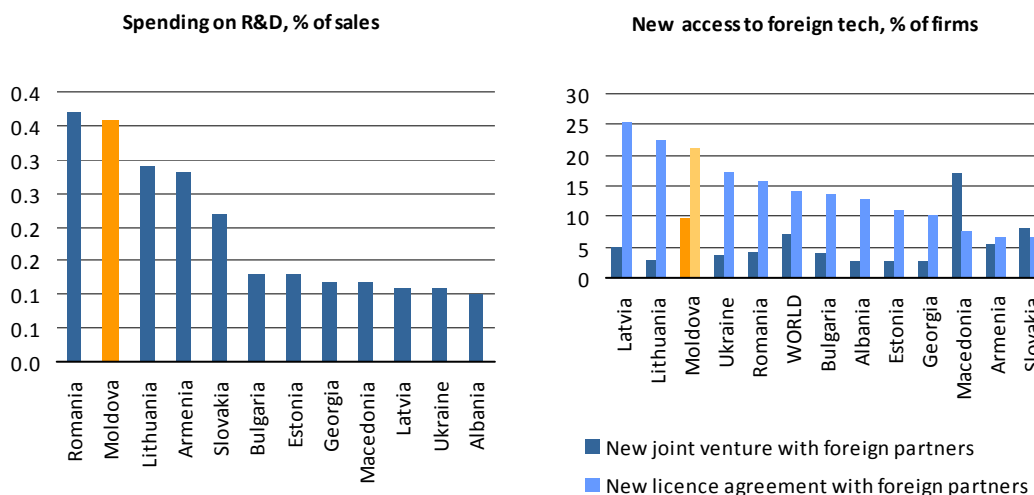
Figure 47. Adopting new production technologies and launching new products



Source: Doing Business 2006, WB

Moldova is roughly at the same level as other countries from the region in terms of the percentage of firms that have adopted new technologies, and among the leaders in terms of the percentage of firms that have launched new products. Remarkable, the country has got upward trends in the area of adoption new technologies (2005 versus 2002).

Figure 48. Technologic effort and potential access to foreign high technologies



Source: Doing Business 2006, WB.

This trend is supported by additional proofs (Figure 48). The left panel shows that the expenditure on R&D incurred by the Moldovan enterprises as a percentage of total enterprise sales is higher than in most of the countries from the region. The right panel displays the potential for accessing foreign new technologies, comparatively with other countries from the region, expressed by the number of new joint ventures and the number of firms that concluded new licensing agreements with their foreign partners.

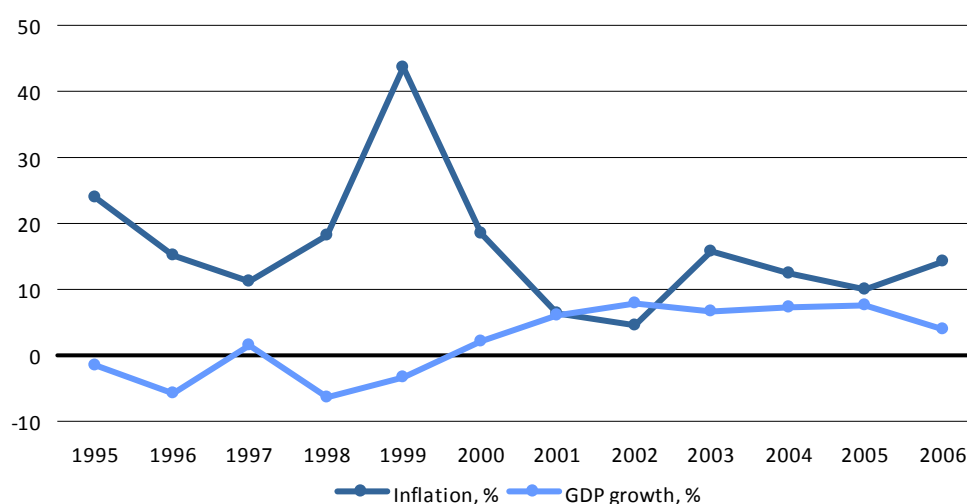
The overall conclusion of this Chapter is that the deficiency of innovations is not a binding constraint to economic growth. Compared to other countries, the exporters diversify successfully the traded goods, the researchers supply a large number of patents (which have a doubtful degree of implementation), and enterprises report positive innovation-related outcomes.

7 Macroeconomic Risks

7.1 Economic Growth

Due to the delay in reforms and as a result of structural deficiencies and strong macroeconomic shocks, the Republic of Moldova entered the transition period being poorer than the majority of the Central and Eastern Europe states, having gone through a transformational rather acute and long-term process (Figure 49). The year of 2000 revealed signs of slight re-launching of the national economy on the background of reduced inflation (in fact, the first signs of stalling the economic decline were noticed in the last quarter of 1999). The average growth rate of GDP recorded during 2000-2006 was circa 6.2%. The economic growth exceeded the average level recorded in Central and Eastern Europe (4.2%), but slightly lower than the average recorded by the CIS countries (7.2%). The growth would have been resumed earlier and would have been much stronger should the Republic of Moldova manage to diversify the external trade and implement consistent structural and institutional reforms³⁰. The recovery of economy on an ascendant trajectory was conditioned in fact by the macroeconomic stability, by an external environment relatively favorable and by the strong evolution of internal and external demand for consumption. The income remitted by the gastarbeiters is counted among the main factors that stimulated the economic growth³¹. Furthermore, economic growth is associated with the reduction of the inflation rate.

Figure 49. Economic Growth and Inflation rate Dynamics in the Republic of Moldova



Source: EIU Country Data, EBRD, IMF, NBM, 2006.

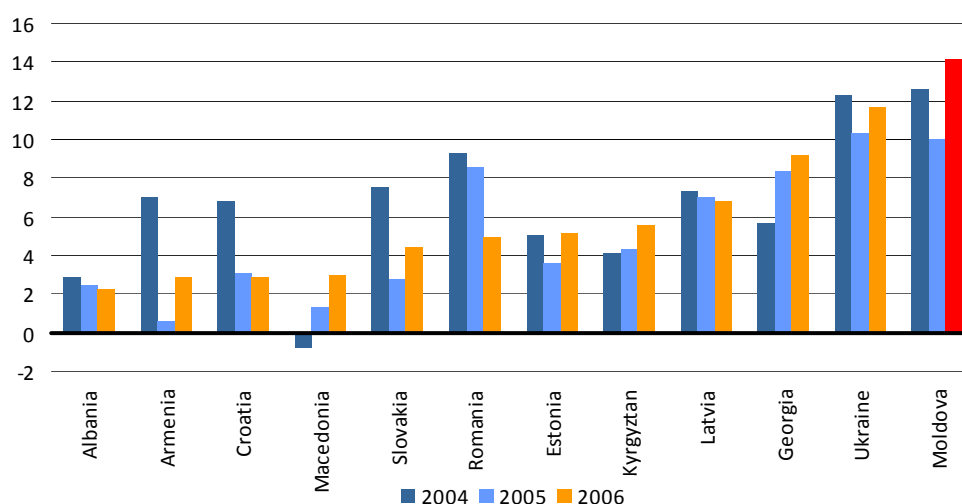
³⁰ National Human Development Report, 2006

³¹ World Bank, 2005

7.2 Inflation

Nevertheless, inflation remains an issue for the country economy. The National Bank of Moldova (NBM) has firmly stated its commitment to reduce inflation by all means. The reduction of inflation rate from circa 2,000% in 1993 to 4.4% in 2002, has established a positive trend towards stabilization of the Moldovan Leu. However, this reduction was preceded by certain tough fluctuations, proven by the experience of 1998-1999, when the inflation rate varied from 18.3% and, respectively, 43.3%; that decline was caused by the Russian financial crisis, and the Republic of Moldova was a captive of the distortion since approximately 70% of its external trade was related to its Eastern partners. During 2001-2002 the National Bank of Moldova managed to bring inflation to one digit. But due to external shocks, inflation reached on average the level of 12% during 2004-2006. In the meanwhile, if we analyze the evolution of prices in the Republic of Moldova, one could not notice a strong correlation between the monthly and quarterly evolutions of monetary aggregates and inflation rate. This makes us conclude that in general, inflation in Moldova does not have a monetary feature, being generated mostly by non-monetary factors, and economists call it as imported inflation. Moreover, Moldova imports approximately 95% of energy resources, most of them from Russia, respectively, directly or indirectly, this conjuncture has an impact over the rate of inflation³². The trends of inflation (comparative) recorded in the course of the past years are shown in Figure 50.

Figure 50 Inflation rates: regional aspects.



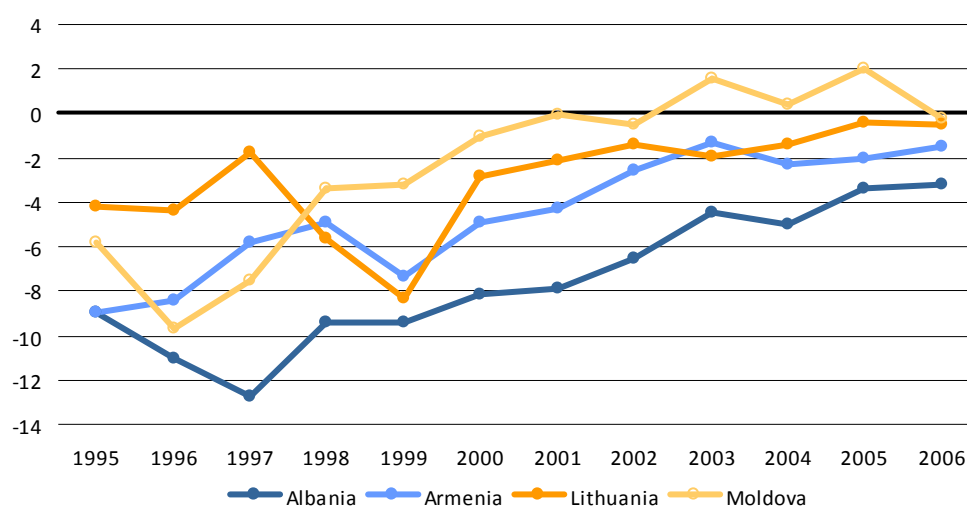
Source: EIU Country Data, EBRD, IMF, 2006

³² For instance, Gazprom suddenly increased the price for the natural gas supplied to the Republic of Moldova from 80 USD/1000m³ to 110 USD/1000m³ in January 2006, and, afterwards, to 170 USD/1000m³ in July 2006. These shocks had a negative impact on the economic growth and inflation indicators in 2006 and it is assumed that their influence will affect the next several years.

7.3 Budget Deficit

At present the budget deficit does not seem to be an issue for the economy. Since 2000, the budget deficit in Moldova has not exceeded 1% of GDP. Moreover, for several years (2003-2005) the state budget had a surplus, and that situation can be noticed clearly in Figure 51. However, things may complicate in case we expand the time horizon. The prolonged dialogue with the IMF experts does not consider, in general, this year; rather, it considers the perspective – appearance of inevitable constraints over the budget beyond the fiscal reform effects (fiscal amnesty, levying zero rate taxes on economic agents)³³. Should we add the expenses related to wage increase, the need to augment the allocations for education and healthcare, those related to infrastructure etc., we could come to an increase of budget expenditures of at least 3-4% of annual GDP, a scenario that could put some pressure over the public consolidated budget over the next years. Hence, the importance of building up a midterm budget becomes evident (multiannual budget programming/planning) and considering the tax policy in a broader context.

Figure 51. Budget Deficit: regional comparison



Source: EIU Country Data, EBRD, IMF, NBM, NBS, 2006.

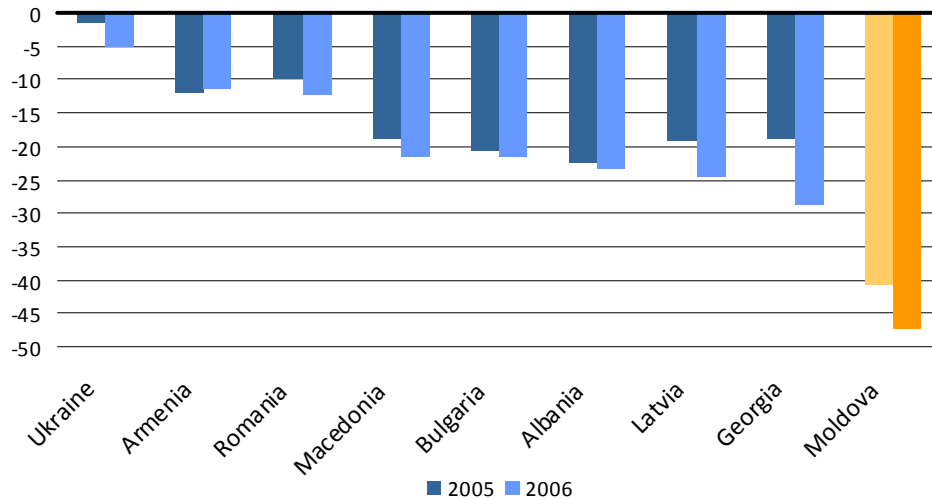
7.4 External Position

External deficits (trade, current account) are one of the most acute macroeconomic issues. The dramatic growth of the trade balance deficit within the past period may serve as a proof that the situation in the external sector has got a pretty negative trend. For instance, in 2006 the trade deficit reached the level of 47% of GDP as it is shown in Figure 52. This is an additional reason to ascertain that Moldova has got a consumption-oriented economy, of imported goods in particular; the production sector being not capable to satisfy the domestic demand so far. Concomitantly, the gross current account deficit relies more on the private sector since the latter borrows more than the state. It could be the case that on the

³³ The Law on amendments and addenda to some legislative acts, No. 111-XVI from April 27, 2007, Official Monitor No. 64-66/300 from May 11, 2007.

background of an expected reduction of the interest rates in domestic currency as well as on the trends of the Moldovan Leu appreciation³⁴, the growth of external deficits would become impossible to stop.

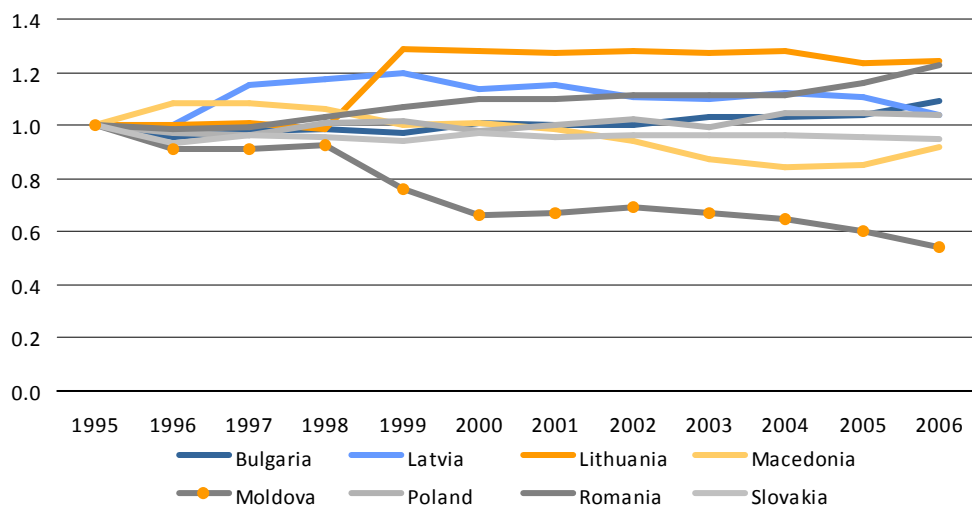
Figure 52. Trade deficit, % of GDP



Source: Economic Intelligence Unit Country Data, EBRD, IMF, 2006.

At the same time, **one can notice the worsening in the terms of trade**. Moldova evolved towards the world terms of trade, but it was affected differentially in comparison with other former Soviet countries. Thus, at present, with one export unit one could buy half of the goods produced in 1995-1997 (Figure 53). We can ascertain that external competitiveness of Moldovan goods is low so far, which is affected also by the high cost of energy resources included in the price of the final product. The wide geographic focus, the narrow gamut and reduced value added of exported goods are the additional factors that reveal the low competitiveness of Moldovan exports.

Figure 53. Terms of Trade

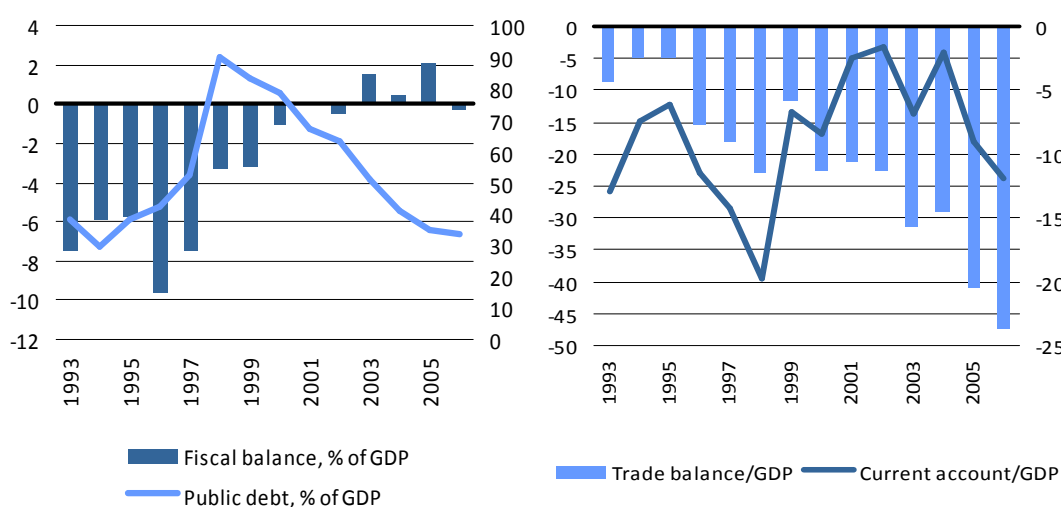


Source: EIU Country Data, EBRD, IMF, 2006; calculations of the authors.

³⁴ Iurie Gotișan, "Strong leu, great leu or new heights for the dollar", <http://www.e-democracy.md/en/comments/socioeconomic/200705151/>

Financing the deficits was relatively easy in the past year, in particular through the money (in foreign currency) transfers of gastarbeiters (less through FDI and placements), but at the end of the day it could be the case that the deficit will reach a certain critical level that would be difficult to sustain. Moreover, if the private sector will continue to borrow like it does at present, while the budget deficit increases, then the Current Account deficit will make up over 15% of GDP. From this standpoint, over heightening of the Current Account Deficit would raise questions to investors in terms of the risk posed on the placement of their money in Moldova due to potential macroeconomic disequilibria.

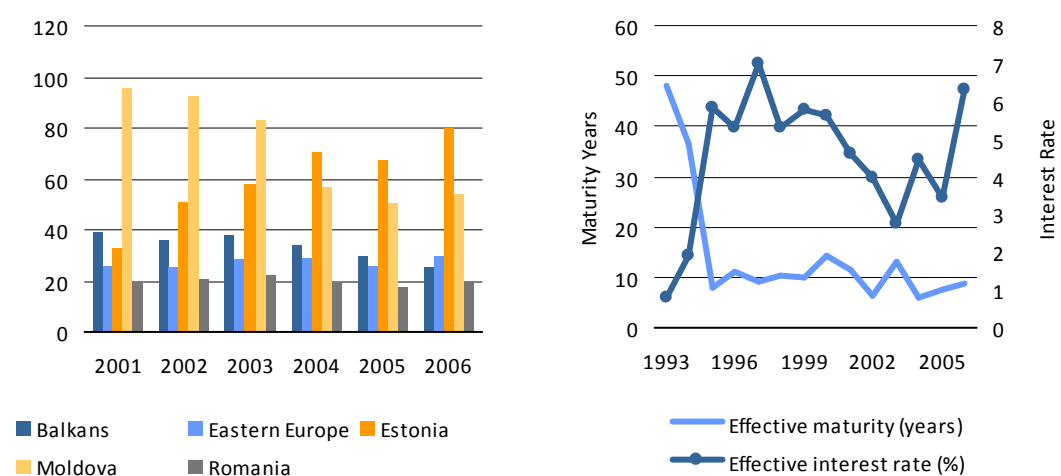
Figure 54. External deficits (Trade, Current Account, Public Debt), % of GDP



Source: EIU Country Data, EBRD, IMF, 2006; annual reports of NBM and MF.

The net external debt of Moldova to GDP recorded downward trends in the past five years. Thus, if in 2001 it made up 97% of GDP, then by the end of 2006 the net debt constituted already 54% (Figure 54). Furthermore, the international borrowing conditions are not among the most optimistic.

Figure 55. Public External Debt and financial maturity



Source: EIU Country Data, EBRD, IMF, 2006

The fact that Moldova does not settle part of its due external debts declined the pressure on the short-term fiscal situation, but it generated reduced level of

international borrowing. Moreover, Moldova practically is absent on the external financial markets, therefore it is granted short financial maturity and high interest rates (Figure 55).

The country risk rating is reduced. The international financial evaluation agencies like Moody's Investors Services or Fitch IBCA that have the goal to rate the country risk based upon the evolution of the main macroeconomic indicators, have provided low rating to the Republic of Moldova. For example, Moldova has got the lowest financial rating from the region assessed by Moody's Investors (Table 5). However, the country ratings established by agencies vary. Recently, Fitch IBCA has amended the rating granted to the Republic of Moldova for borrowings from „stable” to „positive”, as a result of country stability and economic growth and the adopted fiscal discipline. Concomitantly, Fitch has reconfirmed the rating granted to Moldova for long-term external liabilities in foreign currency and national currency at the level of „B-” and, respectively, „B”.

Table 5. Risk premium

Country	Rating Long-Term (Moody's)	Adjusted Basic Margin	Risk Premium total	Risk Premium for the country
Euro zone	Aaa	0	4.91%	0.00%
Slovenia	Aa2	50	5.66%	0.75%
Czech Republic	A1	70	5.96%	1.05%
Estonia	A1	70	5.96%	1.05%
Slovakia	A1	70	5.96%	1.05%
Cyprus	A2	80	6.11%	1.20%
Latvia	A2	80	6.11%	1.20%
Lithuania	A2	80	6.11%	1.20%
Poland	A2	80	6.11%	1.20%
Malta	A3	85	6.19%	1.28%
Croatia	Baa1	100	6.41%	1.50%
Kazakhstan	Baa1	100	6.41%	1.50%
Russia	Baa2	115	6.64%	1.73%
Bulgaria	Baa3	135	6.94%	2.03%
Romania	Baa3	135	6.94%	2.03%
Azerbaijan	Ba1	200	7.91%	3.00%
Armenia	Ba2	250	8.66%	3.75%
Turkey	Ba3	300	9.41%	4.50%
Ukraine	B1	350	10.16%	5.25%
Moldova	Caa1	600	13.91%	9.00%

Source: Adopted from Aswath Damodaran (2007)

http://pages.stern.nyu.edu/%7Eadamodar/New_Home_Page/datafile/ctryprem.html

In conclusion, **the principal macroeconomic risks** include:

- **Inflation Rate Upward Trends;** (however, inflation in the Republic of Moldova demonstrates rather a more marked seasonality, this being linked to the economy still heavy dependence on the Agricultural Sector, on massive imports, and on emerging markets as well), and
- **External Deficit Aggravation** (Trade, Current Account, External Public debt), deficits that make the country economy more vulnerable to external economic risks.

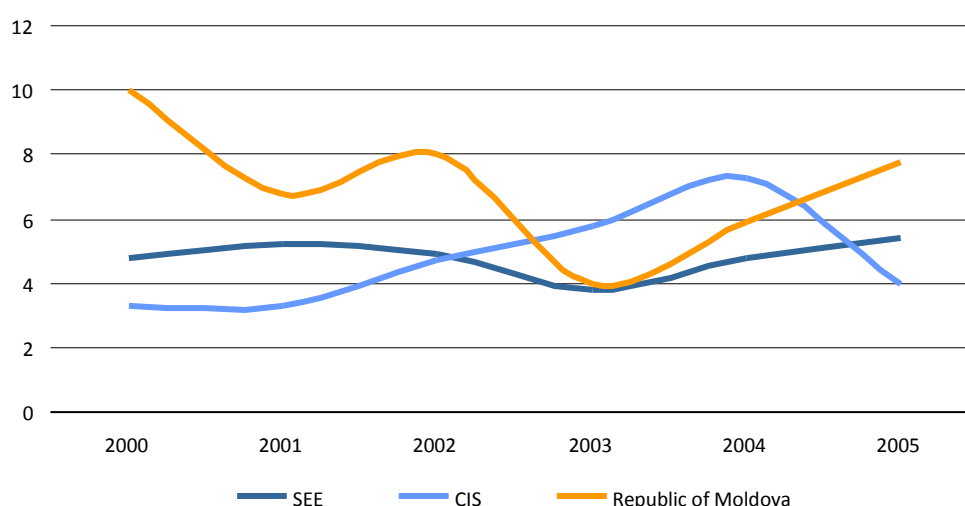
8 Investment and Business Climate

8.1 Foreign Direct Investments

The amount/volume of foreign direct investments (FDI) is considered as one of the main indicators that show how successful a country economic policies and perspectives are. When the FDI are at rise, it may serve as an incentive for other foreign investors to allocate new resources to the respective economy. Thus, after a certain threshold of suspiciousness has been overcome, FDI become an important driving tool for high quality economic development³⁵. In this context it is worth mentioning that the FDI are important not just as foreign currency resources, but also as a combination of experience, knowledge, management practices, marketing innovations and technological know-how, stimulating domestic capital investments as well.

The relatively reduced volume of investments in the Republic of Moldova seems to be conditioned to large extent by a regulatory framework less favorable in comparison with the countries from the region. Despite the fact that the first stage of the regulatory reform of entrepreneurial activity (the „Guillotine” Law) has been implemented successfully in Moldova, and currently the second stage has been unrolling, companies continue to mention regulatory-type constraints as the main cause that impedes their development.

Figure 56. The FDI Net Inflow, % of GDP



Source: RNDU, computed by the Authors based on the EBRD data, 2005.

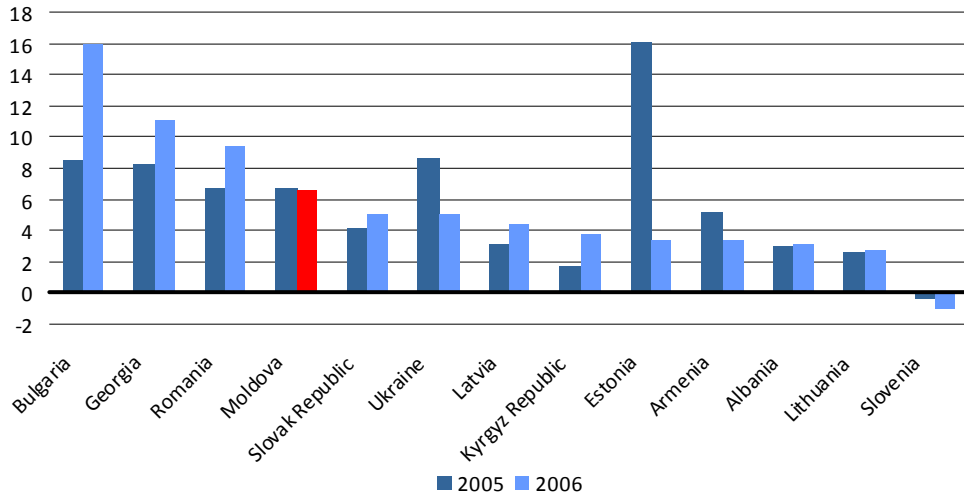
In particular, the conditions of licensing and authorization issuance, the rigidity of labor legislation, and the objectivity of the judiciary system are considered by

³⁵ The Economist, „The Cutting Edge”, February 22, 2001.

companies as binding constraints that shall be addressed in order to ensure sustainable economic growth.

As for the foreign investments inflows, the performance of the Republic of Moldova is ambiguous compared to the world. From the one side, in terms of the FDI / GDP ratio, Moldova has reached and maintains relatively high rates, even higher than the ones recorded by the Central and Eastern Europe countries (Figure 56).

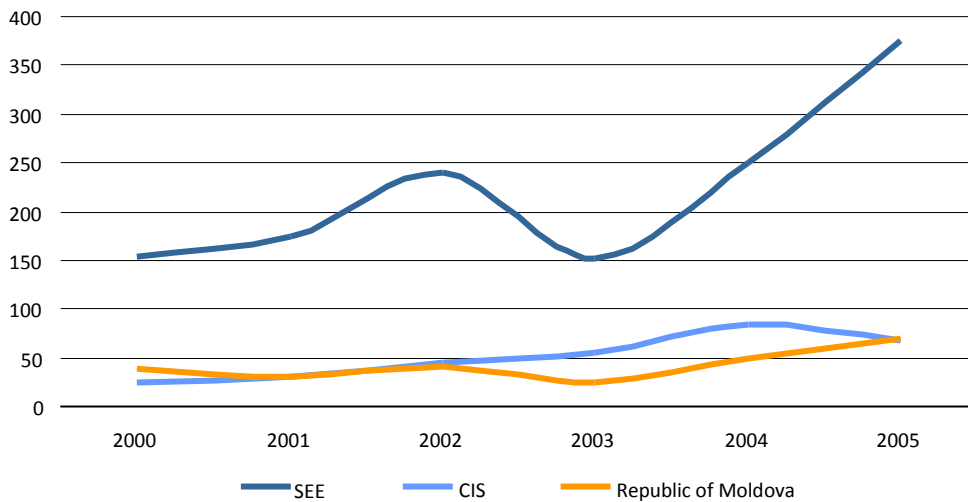
Figure 57. FDI Inflow 2005 - 2006, % of GDP



Source: Transition Report 2007, EBRD

The flow of foreign investments to Moldova in comparison with the countries selected for constraints analysis, shows a similar situation in terms of investment/GDP ratio, Moldova is among the leaders, leaving behind countries more developed like Slovakia, Latvia, Lithuania, Estonia and Slovenia, based on the 2006 data (Figure 57).

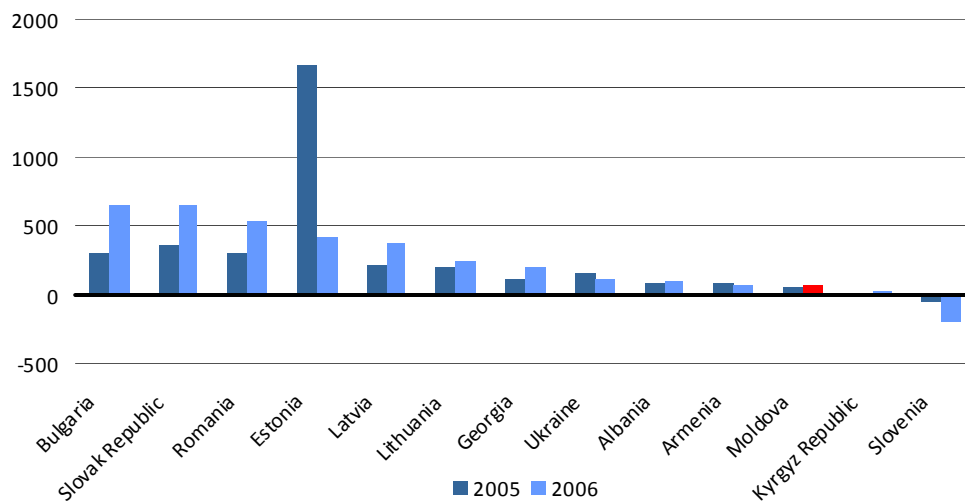
Figure 58. Net Inflow of FDI per capita 2000 - 2005, USD.



Source: RNDU, computed by the Authors based on the EBRD data, 2005

However, as in case of other countries from the CIS, the relatively high level of FDI to GDP is explained rather by the reduced level of GDP than by the FDI nominal volume. As it is shown in Figure 58, FDI per capita for the Republic of Moldova is pretty small in comparison with the CEE countries and similar to the CIS states, situation confirmed by a comparison with the countries selected for constraints analysis (Figure 59).

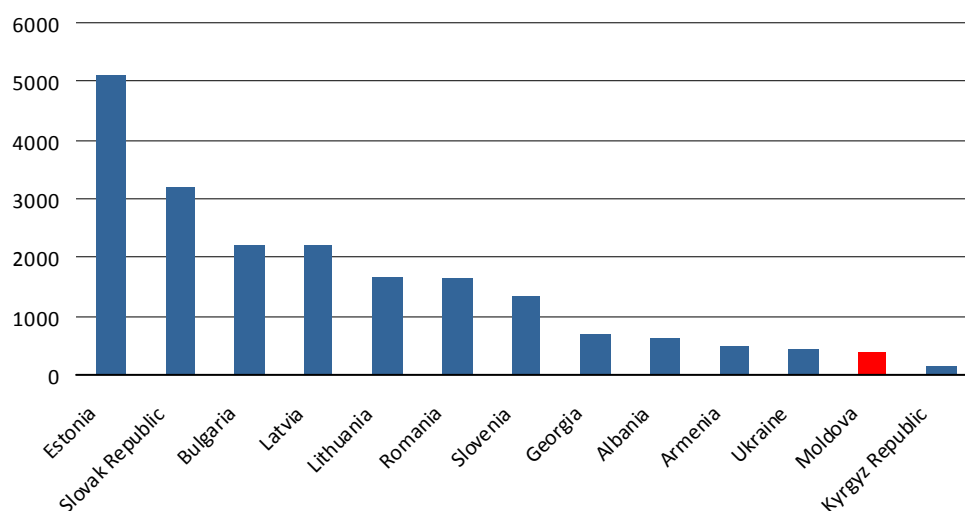
Figure 59. Flow of FDI per capita 2005 - 2006, USD



Source: Transition Report 2007, EBRD.

In the aftermath, the cumulative volume of foreign investments in the Republic of Moldova is, practically, the smallest in comparison with the countries considered and places Moldova on the last but one place in the classification, having outmatched the Kyrgyz Republic only (Figure 60).

Figure 60. Cumulative FDI 1989 - 2006, USD.



Source: Transition Report, 2007, EBRD.

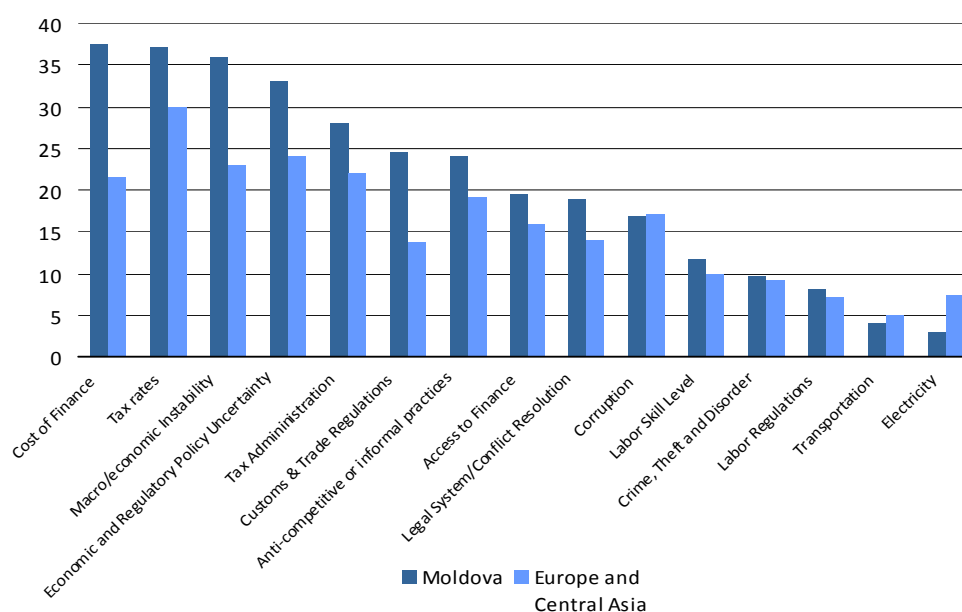
This situation can be explained by multiple and complex reasons. According to the opinions expressed by companies, investors, experts, international financial organizations, non-governmental organizations as well as based on the studies conducted so far, these causes may be summarized in several most important

categories, e.g. small domestic economy, limited natural resources, underdeveloped physical and social infrastructure, unstable framework of economic policies, unfavorable investment climate, mistrust in Justice, in some of the cases, insufficient connection of the education system with the market demands/requirements.

8.2 Conditions for Doing Business

Foreign investors as well as Moldovan companies pretty often complain about frequent audits and inspections, having suggested the authorities to revise the functions of inspection bodies in order to prevent doubling the audits³⁶. Concomitantly, it seems that the business regulatory costs were pretty high in the past five years and, hence, discouraged private investments³⁷. In fact, in the Republic of Moldova, the majority of constraints, except for those related to corruption, transports and electricity, are mentioned more often than on the average by companies from Europe and Central Asia (Figure 61). This status may generate the conclusion that the investment and business climate is less attractive in comparison with the indicated states.

Figure 61. Major Mentioned Constraints, % of Moldovan companies vs. Europe and Central Asia.



Source: Enterprise Survey Index, WB, 2005

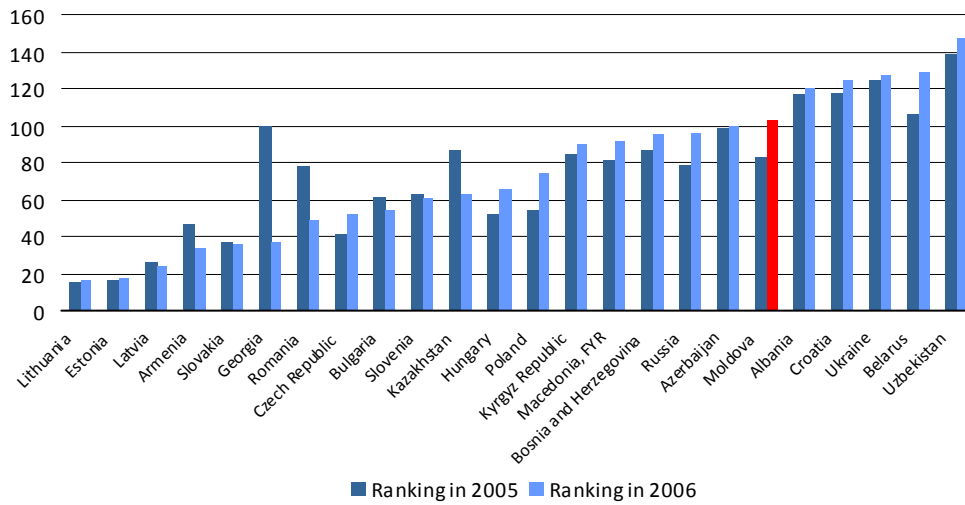
Here we need to take account of the WB Survey on Doing Business conditions, which shows a decline in the country position in the world classification from the

³⁶ Foreign Investors Association FIA, *White Book*, 2006

³⁷ Studies with respect to the business environment and enterprise performance conducted by the WB -EBRD (BEEPS1, 2002 and BEEPS2, 2005) in 1,600 small and medium-sized enterprises and based on country official data.

84th place it held in 2005 to the 103rd, finding itself on the last places compared to the countries from Eastern Europe and Central Asia (Figure 62).

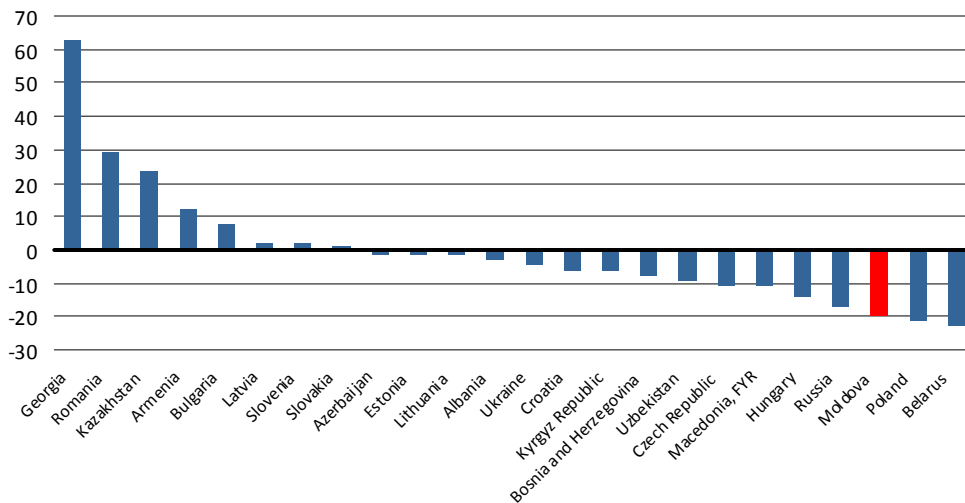
Figure 62. Ranking the conditions for doing businesses; 2006 vs. 2005



Source: Doing Business Survey, WB, 2006.

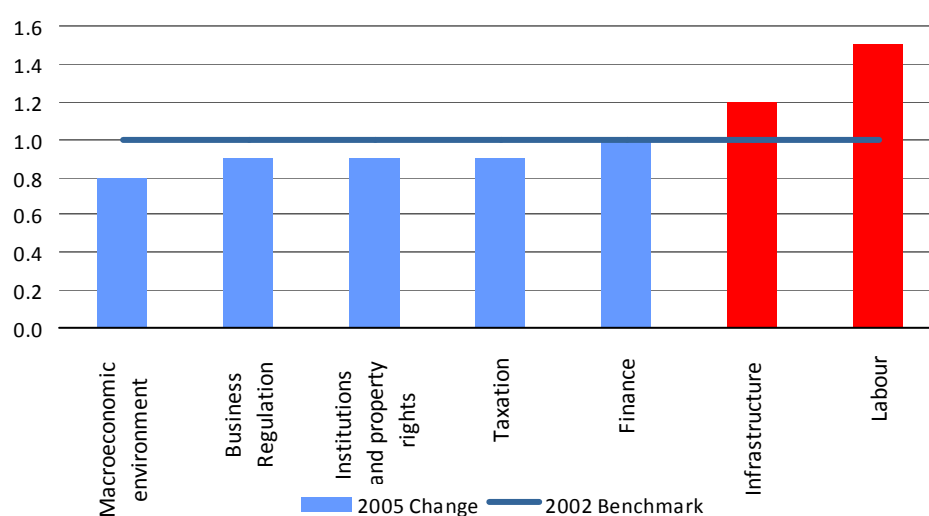
In this context, it is notable that the majority of countries from the Eastern Europe and Central Asia also recorded falls in ranking. However, Moldova proved to be the “first” in the descent speed (Figure 63), which would state that practically in all countries, except for Moldova, reforms have been implemented more rapidly.

Figure 63. Changing the Ranking of conditions for doing businesses; 2006 vs. 2005



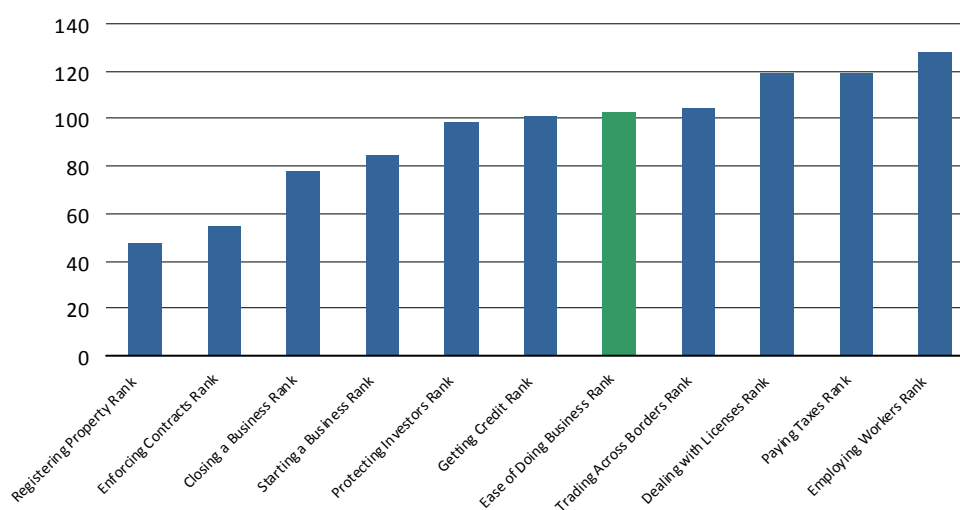
Source: Doing Business Survey, WB, 2006.

The position of Moldova in the WB ranking with respect to the conditions of doing business has got a downward trend although other reports state clearly that, in general, the conditions in the country are not worsening, may be except for infrastructure and supply with human resources (Figure 64). This is one more proof that in other countries the conditions for doing business improved more without obstruction.

Figure 64. Changing the Moldovan Business Environment Conditions, 2005 vs. 2002³⁸

Source: EBRD Transition Report 2006

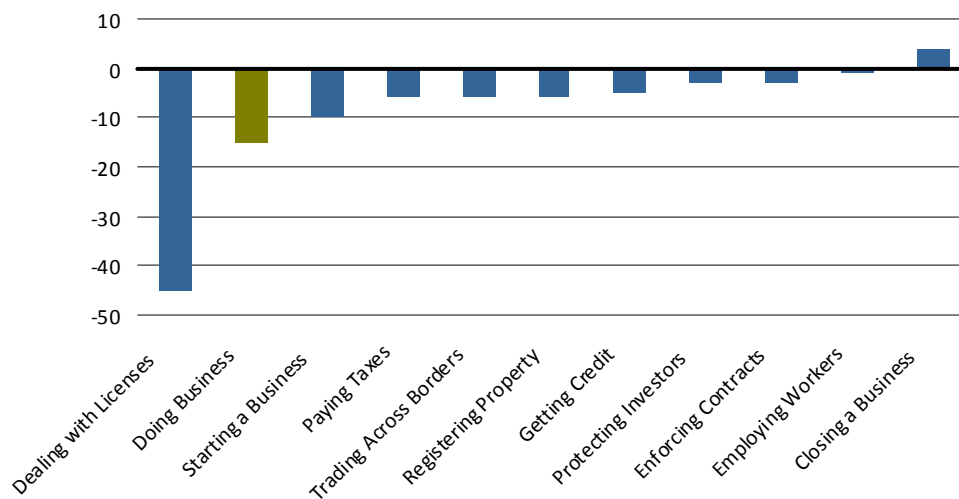
The ranking components that worsen Moldova general position include import / export conditions, licensing conditions and authorization issuance, taxation and tax payment conditions, and staff employment conditions (Figure 65). Apparently, these could be the main constraints that affect negatively the conditions of doing business in the Republic of Moldova.

Figure 65. Rank Components with respect to conditions for doing business in Moldova.

Source: Doing Business Survey, WB, 2006.

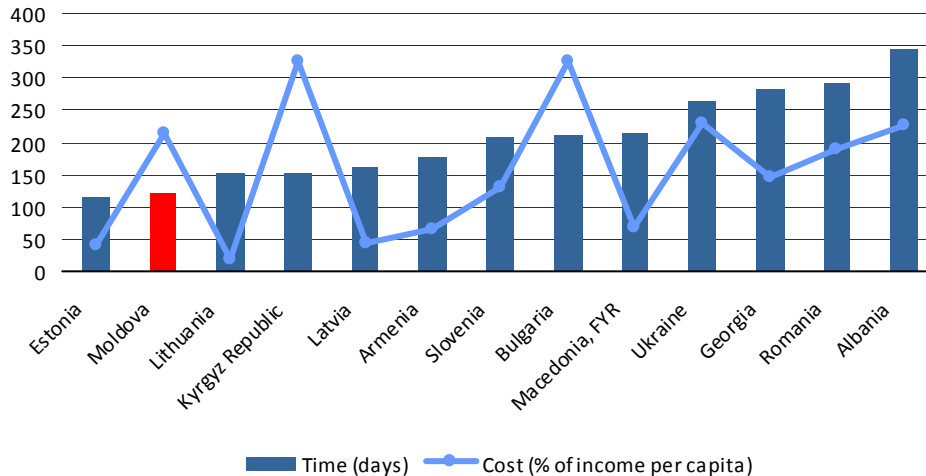
The ranking component on which Moldova recorded the fastest fall/descent is dealing with licensing and authorization issuance, followed by the conditions for launching businesses, again, taxation and tax payment conditions, registration of property, and access to credits (Figure 66).

³⁸ Here, the year of 2002 is considered as benchmark, and the figure portrays changes that took place until 2005, covering seven aspects of the business environment: macroeconomic environment, business regulation, institutional and property rights, taxation, finance, infrastructure and labor force. Cases where the indicator exceeds the benchmark indicate deterioration in the business environment, which is ranked at a scale of 1 (no obstacle) to 4 (major obstacle).

Figure 66. Change in the Rank Components in Moldova, 2006 vs. 2005

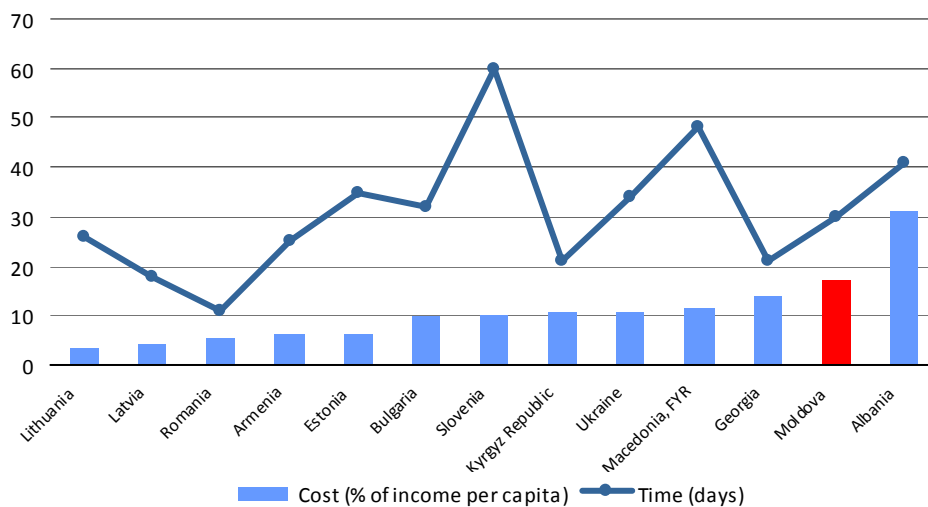
Source: Doing Business Survey, WB, 2007

A comparative analysis of conditions for licensing and authorization issuance shows that Moldova, in fact, does not hold the worst position on these matters, may be just concerning the costs associated with getting licenses and authorizations, which could be a more noticeable constraint (Figure 67).

Figure 67. Conditions of Licensing

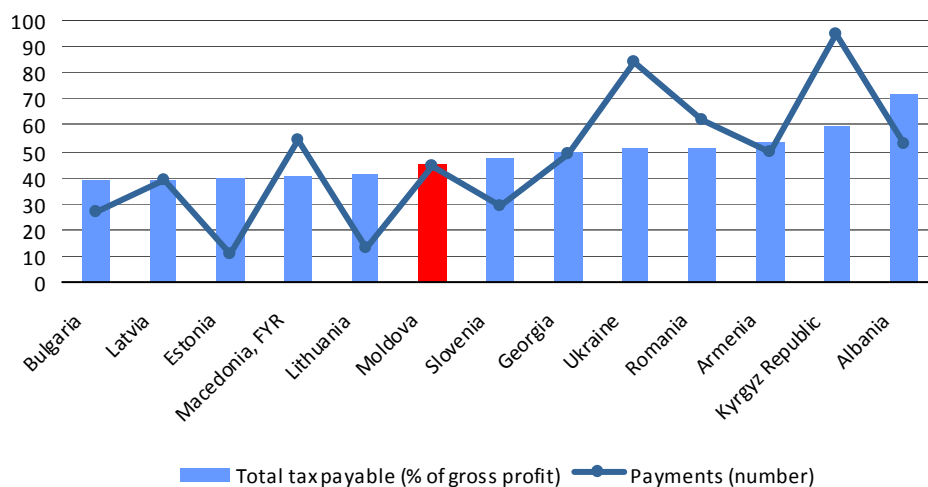
Source: Doing Business Survey, WB, 2006.

The same thing may be pointed out about the procedures to be followed in the endeavor to launch a business. In this respect, in comparison with other considered countries, Moldova is placed in the middle. What marks Moldova out are the costs compared to the income per capita, where the country is positioned the last but one, which means that comparatively higher costs are in place (Figure 68). Here we have to mention that an eventual more noticeable growth of the country GDP may amend substantially this indicator.

Figure 68. Costs and time needed to launch a business

Source: Doing Business Survey, WB, 2006.

In terms of taxation, it seems that Moldova is neither better nor worse compared to the others; being placed in the middle in terms of percentage of gross profit and the number of payments (Figure 69)³⁹.

Figure 69. Tax rates and the number of payments

Source: Doing Business Survey, WB, 2006.

There is an ambiguous situation in terms of taxes as a share of GDP. According to the situation from 2005, the country is placed in the area with the largest taxes⁴⁰ (Figure 70), which could be associated at that time with an important constraint. However, we need to mention that recently in Republic of Moldova a fiscal liberalization program has been approved, which among other provisions implies exemption from profit tax in case of its channeling into investments⁴¹. Thus, the

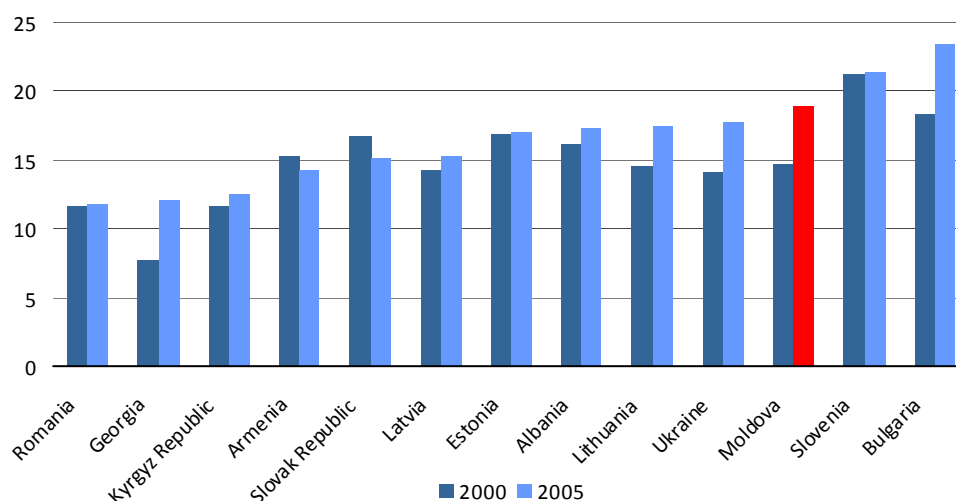
³⁹ Situation is referred to taxes paid to the central budget only.

⁴⁰ Data regarding the central government taxes have been adjusted by the WB according to the Government Finance Statistics Manual, 2001.

⁴¹ Law No. 111 from April 27, 2007 on Fiscal Liberalization.

real situation in terms of tax volume could be more favorable for the companies that function in Moldova.

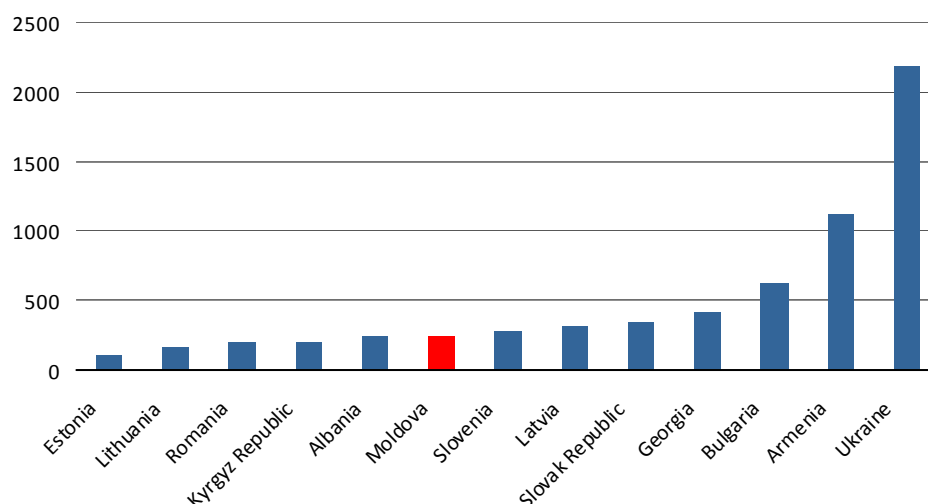
Figure 70. Share of Central Government revenues derived from taxes as a share of GDP (% of GDP).



Source: World Development Indicators, WB, 2006.

The time necessary for preparation, documentation and payment of taxes, likewise, does not show something unusual, Moldova being positioned with a slightly reduced time necessary for preparation, documentation and payment of taxes to the central budget (Figure 71).

Figure 71. Time for preparation, documentation and payment of taxes in 2006, hours



Source: World Development Indicators, WB, 2007.

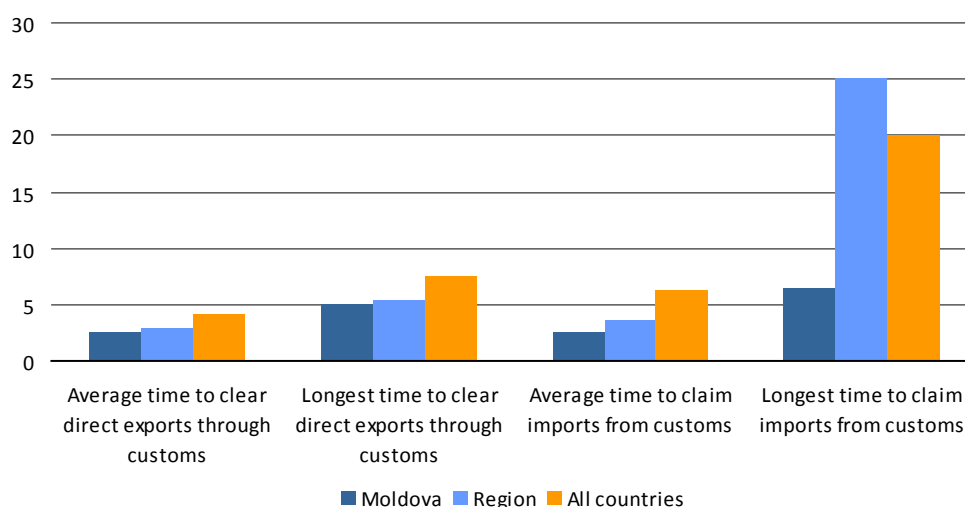
However, in terms of enterprise efforts to ensure observance of the current legislation with respect to taxes, in particular, ensuring sound reporting, these seem to be much more significant. According to a study conducted in April 2006⁴², companies are obligated to submit reports to the State Territorial Tax

⁴² Study concerning the reporting procedures followed by economic agents from the Republic of Moldova, USAID/BIZPRO, 2006.

Inspectorates (STTI), Territorial Offices of Statistics (TOS), Territorial Offices of the National Company of Social Insurance (CNAS), the „Apele Moldovei” State Agency and to ecologic inspectorates. Likewise, in order to take records of medical insurance policies, the enterprises have to visit the National Company of Medical Insurance (CNAM). Out of this reports, the major parts of them go to the STTI and TOS, altogether making up between 65% and 88% of the number of titles and 85% - 95% of the volume of efforts necessary to fill out the reports.

In fact, the total real costs related to the reporting process comprise also the costs of wages of persons that carry out this process, and costs related to transport. Thus, the majority of enterprises spend annually more than two monthly average wages of the Moldovan economy⁴³. As for the enterprises with more considerable activity, one person works four-five months to ensure the compliance with the reporting process. For the companies from the settlement of their residence and the institutions they submit the reports to, the expenses related to trips and submission of reports may vary from 30% to 100% of the expenses incurred for developing the reports. For enterprises from the rural area the expenses incurred for submission may exceed those incurred for developing the reports several times.

Figure 72. Constraints related to Import/Export⁴⁴ operations



Source: Enterprise Survey index, WB, 2005

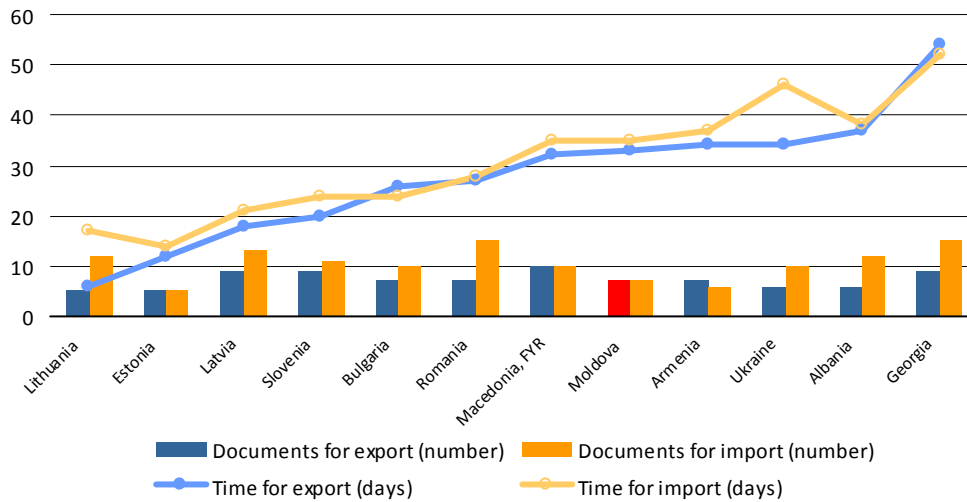
A slightly different situation may be observed in terms of import/export operations. Apparently, in comparison with both the countries from the region and the other countries included by the WB in the private enterprise activity survey, Moldova is placed under the average in terms of constraints related to import/export operations, in particular, with respect to the average time necessary

⁴³ The average wage in the Republic of Moldova economy made up 1,936 MDL (approximately 150 USD) in April 2007.

⁴⁴ The figure refers to four main indicators that describe the import/export process, i.e. average time (days) to clear export operations through customs; longest time (days) to clear export operations through customs; average time (days) to claim imports from customs; and longest time (days) to claim imports from customs.

to clear/claim exports/imports through/from the customs (Figure 72), which means that one should not expect to have binding constraints in this regard.

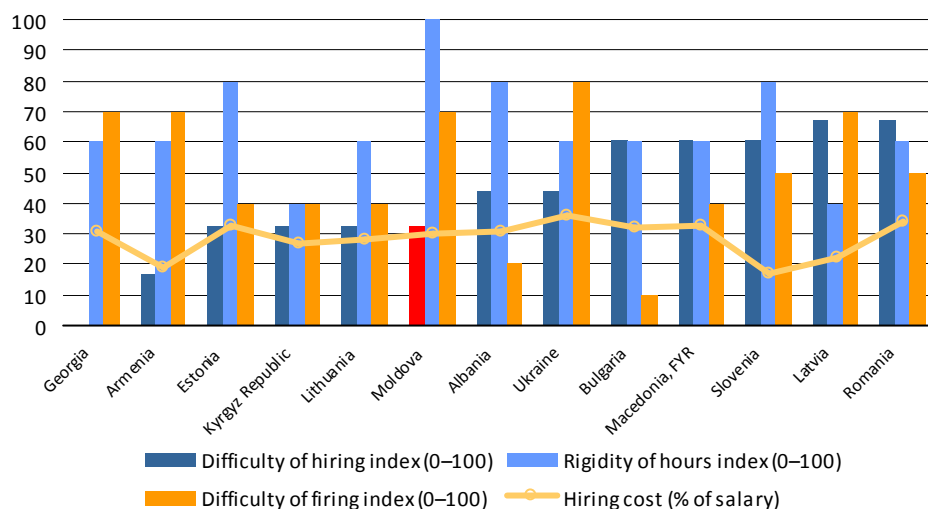
Figure 73. Export/Import Conditions



Source: Doing Business Survey, WB, 2006.

However, a comparative analysis with the considered countries would reveal some nuances to take account of. For example, although the number of documents necessary for import/export operations is rather small, the amount of time necessary for carrying out import/export operations seems to be pretty large in comparison with the countries of reference (Figure 73), Moldova being placed among the countries with the longest time spent in order to comply with the established procedures. Thus, for a small country that does not have a considerable domestic market, this fact might represent an impediment to economic development.

Figure 74. Labor Force Recruitment and Discharging



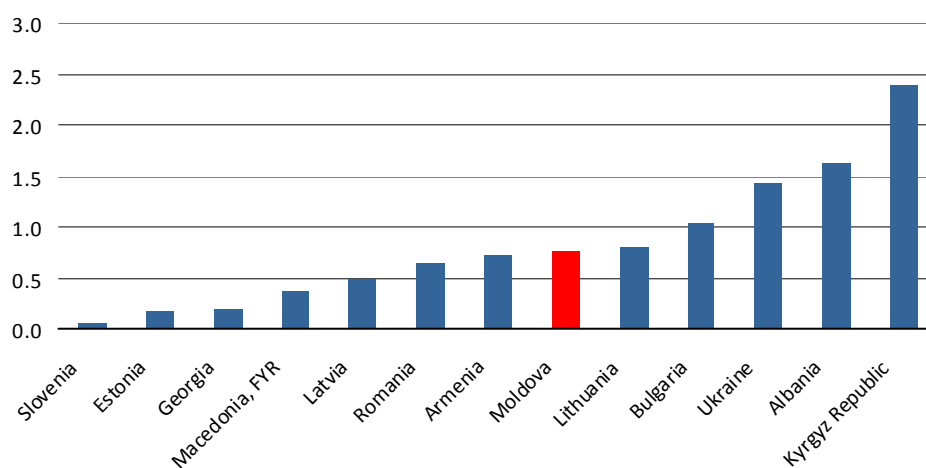
Source: Doing Business Survey, WB, 2006.

The regulatory framework in terms of labor force recruitment and discharge represents another issue more and more frequently mentioned by the enterprises functioning in the Republic of Moldova (Figure 74). In fact, the indicators

represented in Figure 74 measure the regulatory level of hiring procedures and the rigidity of business hours. These indicators may vary from 0 to 100, higher values meaning more rigid regulations. Thus, the hiring difficulties index as well as the costs of hiring seems to be under the average for the region, however, the rigidity of business hours and the discharging conditions „spoil” the general picture, placing Moldova among the countries with maximal rigidity of labor force hiring regulations.

Surprisingly, the companies-participants to the WB 2006 survey show a relatively reduced level of non-official payments to make things done (Figure 75). So, we could conclude that in terms of corruption Moldova is doing well, although the situation in Armenia and Georgia seems to be better.

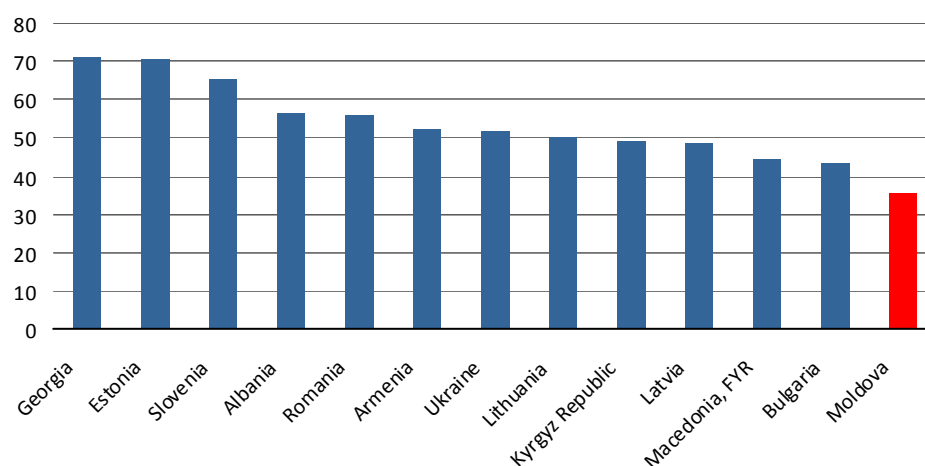
Figure 75. Unofficial payments for a typical company to make things done, % of sales



Source: Enterprise Survey Index, WB, 2005.

However, it seems that one of the issues the Moldovan businessmen confront with would be the biased/unfair judicial system (Figure 76). With respect to this matter, there are opinions that if entrepreneurs are not sure about the judicial system impartiality they would not be willing to invest. For example, some WB reports⁴⁵ declare that circa 80% of the questioned enterprises from Moldova qualify the judicial system as „unfair, expensive, corrupted and incapable to impose the observance of Law”. In other circumstances, more investors believe that the Moldovan justice is unreliable for them, due to the fact that the courts of justice secure/protect the state institutions only. The main conclusion drawn based on this situation is that the judicial system is the „big loser”, while Moldova is the country with the smallest number of entrepreneurs that trust the system.

⁴⁵ World Bank Development Data & Statistics.

Figure 76. Trustfulness in the Judicial System, % of questioned persons

Source: Enterprise Survey Index, WB, 2005.

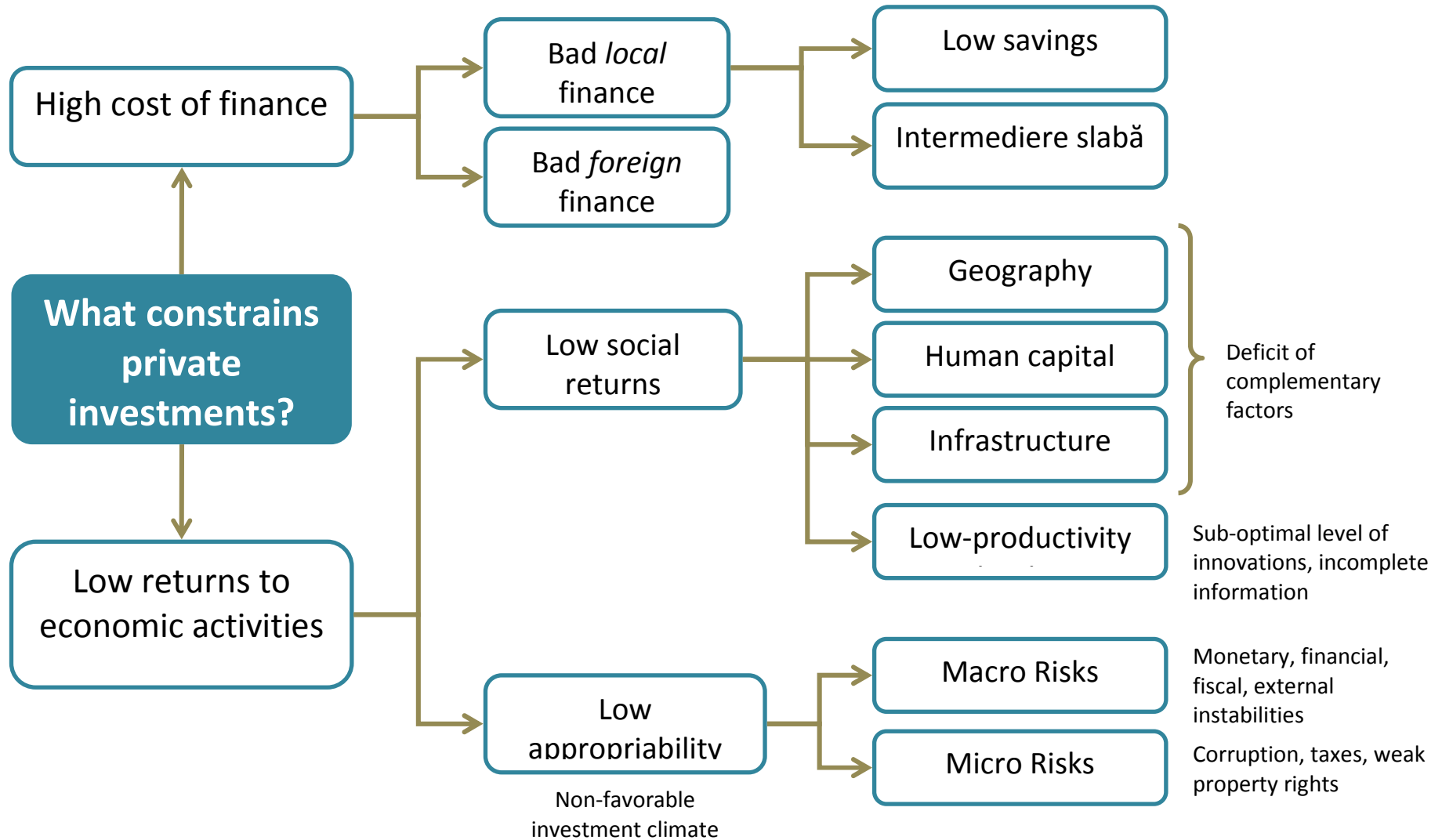
In general, the investment and business climate in Moldova, even if it marked out a tendency towards improvement, in comparison with the reference countries, seem to make the country lose slightly its attractiveness, especially due to the conditions of license and authorization issuance, rigidity of labor relations, and objectivity of the judicial system. Another important aspect is represented by the indirect costs related to taxation process. Hence, even if the size of taxes may not be considered as a major problem, the costs incurred for preparing and submitting the reports to relevant bodies represent with no doubt a subject that must be addressed in the future.

Annexes

Annex 1. Concept of Constraints Analysis

Annex 2. Mincer Regressions

8.3 Annex 1: The Concept of Constraints Analysis



8.4 Annex 2: Mincer Regressions

Table 1. Regressions of log of hourly wage on number of years of education

	All urban			Urban males		
	(1)	(2)	(3)	(4)	(5)	(6)
Years of education	0.135 (11.85)***	0.134 (11.78)***	0.149 (12.37)***	0.134 (11.35)***	0.127 (11.37)***	0.149 (11.48)***
Experience	0.022 (4.99)***	0.020 (3.93)***	0.017 (3.50)***	0.031 (4.53)***	0.025 (3.41)***	0.021 (3.16)***
Experience squared	-0.001 (6.35)***	-0.001 (5.47)***	-0.000 (4.72)***	-0.001 (5.33)***	-0.001 (4.55)***	-0.001 (4.07)***
Female	-0.271 (11.32)***	-0.268 (12.04)***	-0.195 (9.05)***			
<i>Sector (omitted: agriculture)</i>						
Industry			0.447 (3.83)***			0.546 (4.86)***
Constructions			0.602 (5.26)***			0.711 (6.29)***
Commerce, hotels and restaurants			0.291 (2.80)***			0.448 (3.98)***
Transport and communications			0.571 (5.37)***			0.658 (5.76)***
Public administration, education, healthcare and social assistance			0.223 (2.04)**			0.242 (2.07)**
Other			0.461 (3.30)***			0.505 (3.81)***
<i>Property (omitted: public)</i>						
Private			0.243 (4.43)***			0.239 (4.83)***
Mixed public-private			0.217 (3.15)***			0.145 (1.91)*
Foreign-owned			0.533 (3.21)***			0.690 (2.89)***
Foreign participation			0.225 (2.22)**			0.299 (2.32)**
Constant	1.832 (16.32)***	1.454 (7.89)***	0.818 (4.99)***	1.815 (10.78)***	1.395 (5.70)***	0.573 (3.07)***
Tenure on job		YES	YES		YES	YES
Month dummies	YES	YES	YES	YES	YES	YES
Observations	10923	10433	10433	5270	5008	5008
R ²	0.157	0.166	0.212	0.134	0.160	0.214

t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 2. Regressions of log of hourly wage on education levels

	All urban			Urban males		
	(7)	(8)	(9)	(10)	(11)	(12)
<i>Education (omitted: primary or less)</i>						
Higher education	1.027 (7.11)***	1.065 (6.96)***	1.121 (6.64)***	1.040 (4.39)***	1.236 (8.14)***	1.491 (6.10)***
Vocational education	0.454 (3.42)***	0.500 (3.56)***	0.487 (3.09)***	0.485 (2.07)**	0.709 (4.48)***	0.849 (3.38)***
Secondary complete	0.275 (2.07)**	0.332 (2.37)**	0.318 (2.01)*	0.275 (1.17)	0.535 (3.30)***	0.686 (2.75)***
Secondary incomplete	0.030 (0.19)	0.075 (0.46)	0.081 (0.47)	-0.006 (0.02)	0.214 (1.14)	0.384 (1.47)
Experience	0.024 (5.90)***	0.021 (4.56)***	0.019 (4.17)***	0.031 (4.61)***	0.024 (3.39)***	0.022 (3.37)***
Experience squared	-0.001 (7.33)***	-0.001 (6.16)***	-0.000 (5.39)***	-0.001 (5.44)***	-0.001 (4.52)***	-0.001 (4.31)***
Female	-0.248 (10.38)***	-0.246 (11.11)***	-0.175 (8.00)***			
<i>Sector (omitted: agriculture)</i>						
Industry			0.449 (3.76)***			0.541 (4.73)***
Constructions			0.603 (5.37)***			0.697 (6.37)***
Commerce, hotels and restaurants			0.304 (2.91)***			0.447 (4.03)***
Transport and communications			0.569 (5.26)***			0.649 (5.49)***
Public administration, education, healthcare and social assistance			0.235 (2.16)**			0.235 (2.04)**
Other			0.465 (3.30)***			0.512 (3.78)***
<i>Property (omitted: public)</i>						
Private			0.236 (4.27)***			0.233 (4.71)***
Mixed public-private			0.215 (3.25)***			0.133 (1.74)*
Foreign-owned			0.522 (3.09)***			0.705 (2.91)***
Foreign participation			0.227 (2.16)**			0.319 (2.47)**
Constant	2.827 (19.93)***	2.385 (12.95)***	1.890 (9.86)***	2.801 (10.74)***	2.094 (8.28)***	1.308 (4.81)***
Tenure on job		YES	YES		YES	YES
Month	YES	YES	YES	YES	YES	YES
Observations	10923	10433	10433	5270	5008	5008
R ²	0.161	0.170	0.212	0.139	0.163	0.216

t statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3. Is higher education better remunerated by companies with foreign capital?

	Log wage/hour
Higher education	0.701 (13.46)***
Foreign owned firm	0.152 (1.10)
Higher education * foreign owned	0.436 (2.74)***
Experience	0.024 (5.12)***
Experience squared	-0.001 (6.70)***
Female	-0.180 (7.82)***
Constant	2.321 (16.80)***
Sector effects	YES
Tenure on job	YES
Month dummies	YES
Observations	10433
R ²	0.197