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**Republic of Moldova: Selected Issues**

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INTERNATIONAL MONETARY FUND

REPUBLIC OF MOLDOVA

**Selected Issues**

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# I. IN SEARCH OF MONETARY TRANSMISSION IN MOLDOVA[1]

## A. Introduction

1.      Following the pattern of many central banks in Central and Eastern Europe, the National Bank of Moldova (NBM) has recently announced its intention to move, over the medium term, to formal inflation targeting (IT) – a policy framework that is rapidly gaining popularity around the globe. One of the key preconditions for inflation targeting is a properly functioning monetary transmission mechanism, which is not yet well understood in Moldova.

2.      There are a number of channels, through which transmission can take place depending on a host of factors including the structure of the economy, the extent of financial market development, balance sheet positions of economic agents, the history of inflation, etc. At the early stages of transition, the exchange rate channel is thought to play a key role. Other channels of transmission, of which the interest rate channel, the asset price channel and the credit channel are most widely cited in the literature, tend to be dominant in more developed countries. These channels have so far appeared to have little impact in Moldova. However, with the planned introduction of the new policy framework, the interest rate channel, which is one of the pillars of IT, has started to attract a growing attention. It is essential for an inflation targeter central bank to understand how, by how much and over what period of time changes in policy interest rates pass-through to inflation. There has been very limited research done in this area for Moldova and, therefore, little is known about determinants of inflation and the interest rate channel of monetary transmission. This paper is an attempt to make a contribution to the literature.

3.      The paper is structured as follows. Section 2 gives an overview of the interest rate channel of transmission. The next section provides background on Moldovan financial markets, liquidity conditions and the current framework of monetary policy. Section 4 sets out the formal model used to estimate the strength and the speed of the pass-through, and section 5 discusses the results. The final section draws conclusions.

## B. Interest Rate Channel of Transmission

4.      The process of transmission through the interest rate can be divided into three stages. At the first instance, the central bank policy rate is assumed to cause market rates (money market, treasury bills, etc.) to move, from short term rates to longer maturities through the yield curve. In the next stage, the changes in market rates should pass through to commercial bank lending and deposit rates, which in turn, in the final stage, alter spending and investment behavior of households and enterprises, and ultimately prices through shifts in

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aggregate demand. The potency of monetary policy to a large extent depends on the speed and the degree of pass-through, i.e. how fast and by how much changes in interest rates get passed through at each stage of the process. The stronger and faster the impact, the more effective is transmission.

5.      Normally central banks operate at the lower end of the maturity structure, where the impact of policy rates on market rates is strongest and immediate. The first stage of transmission occurs as the change in short term rates works its way through the rest of the money market yield curve, which if stable, would only shift in response without modifying its slope. In this case the pass through would be proportionate, if not one-to-one, to the policy rate change (Crespo-Cuaresma, Egert, and Reininger, 2006). However, depending on the shape and stability of the yield curve longer-term market rates may react differently to policy shifts and, therefore, strengthen or weaken transmission. Several different approaches, or a combination of those, could explain the term structure of interest rates. First, according to the expectations hypothesis, if investors are risk-neutral, market arbitrage will ensure that long-term rates derive as a geometric mean of expected short-term yields, which in turn depend on expectations of inflation and exchange rate movements. Second, liquidity preference induces risk-averse investors to demand a term premium on longer maturities resulting in higher long-term rates. Finally, the market segmentation view, which allows for long and short term maturities to be traded independently in separate market segments, implies that interest rates at two ends of the yield curve are disconnected and do not move in tandem.

6.      The second stage of transmission describes how changes in market interest rates influence retail lending and deposit rates. The connection is well illustrated by the cost of funds approach (De Bondt, 2002), which assumes that market rates represent opportunity costs for banks and depositors. Instead of loans, banks can channel liquidity into the money market or corporate securities, while households and enterprises may also opt for the latter as opposed to deposits. Therefore, an increase in market rates, including in response to changes in policy rates, translates into higher lending and deposit rates.

7.      Following De Bondt the cost of funds approach can be formalized as a mark-up pricing model:

$$i^R = \alpha + \beta \cdot i^M$$

where $i^R$ and $i^M$ are retail and market rates respectively; $\beta$ is a pass through coefficient, and $\alpha$ is a markup. In perfect markets (full information and perfect competition), $\beta$ would equal to 1, implying a unit interest rate elasticity of demand for deposits and loans (Coricelli, Egert, and McDonald, 2006). In practice, however, the pass-through is usually weaker with $\beta < 1$. Imperfect substitutability of money market instruments for loans and deposits, imperfect competition among banks and in the financial sector in general, customer loyalty to banks and vice a versa, and possibly high switching costs may weaken the connection between retail banking and money market interest rates to various degrees.

8.      In the final stage of transmission, changes in retail interest rates influence households and enterprises to adjust their spending behaviors. Other things equal, as interest rates increase, household consumption is expected to decline and savings increase. Similarly, demand for loans decreases and businesses cut spending and investment. As a result, aggregate demand declines putting downward pressure on prices. Clearly, retail interest rates are not the only variables that influence inflation. The exchange rate, money supply, income growth and distribution, to mention only a few, also affect inflationary expectations or otherwise cause shifts in aggregate demand and/or supply, and thus play an important role in price dynamics.

## C.  Moldova's Financial Markets

9.      The background in the preceding section points to the fact that the strength of transmission at each stage and, therefore, the potency of monetary policy as a demand management tool in the hands of country authorities, largely depends on the effectiveness and the degree of development of financial markets. Market segmentation and disconnect between interest rates on different market instruments is more likely to occur in shallow and underdeveloped markets than in mature ones with more sophisticated financial infrastructure.

10.     The main challenge facing the National Bank of Moldova is to manage large inflows of foreign exchange. Remittances from Moldovans working abroad have been growing steadily over the past 7 years reaching 35 percent of GDP in 2006. More recently, foreign direct investments have also picked up. These inflows have been exerting strong appreciation pressures, while at the same time pumping liquidity in the system. Although the central bank law clearly defines price stability as the primary objective of monetary policy, the attempts to balance multiple, and often conflicting, objectives of inflation, exchange rate stability and low interest rates, have led to partly sterilized foreign exchange intervention and a liquidity overhang.

11.     The NBM uses a so-called "corridor" structure of policy rates whereby standing facilities of overnight deposits and credits form the lower and upper bounds for market rates. The main monetary policy tool used for liquidity management purposes is weekly auctions of NBM certificates, which was introduced in 2005 to gradually replace credit and deposit auctions. However, with the overnight deposit rate set at 2 percent, when 7-day NBM certificates yield 16 percent, the corridor appears to be too "wide" to attract liquidity. Moreover, even at 16 percent, the NBM has been facing difficulties in sterilizing foreign exchange inflows, implying that further tightening by increasing interest rates might be in order. The resistance to allow more exchange rate flexibility and to raise policy rates has been complicating the conduct of monetary policy sending confusing signals to market participants regarding policy intentions.

12.     The banking system, which is by far the largest and the most advanced segment of the Moldovan financial sector, remains underdeveloped despite strong growth over the past

15 years. While expanding rapidly at about 35-40 percent per annum over the past 5-7 years, total credit is only 31 percent of GDP, and maturities are short. Competition is weak as suggested by a considerably higher level of ROA than in other European countries, while a particularly high level of capital adequacy indicates presence of inefficiencies and capacity constraints in the Moldovan banking system (Figure I.1). Foreign banks have only recently started to show interest and enter the Moldovan market.

13.     Capital markets are at a rudimentary level with only a handful of corporate stocks being publicly traded, and thus are not yet perceived as a source of financing. Instead, personal savings fed by remittances from abroad, bank loans and, more recently, rapidly growing foreign direct investments underpin capital and consumer spending.

**Figure I.1. Return on Assets and Capital Adequacy Ratios**
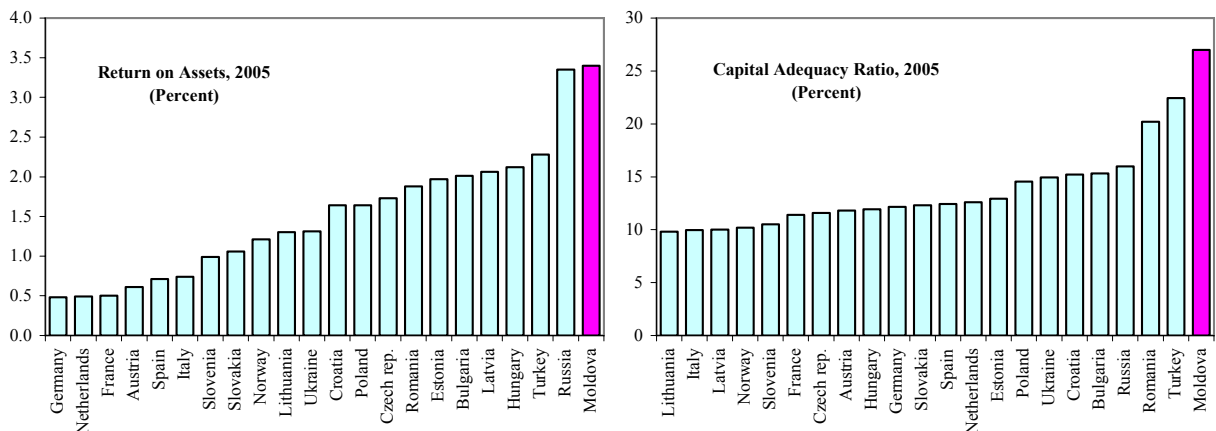


Source: IMF and Moldovan authorities

14.     The money market comprises three segments: T-bills, NBM certificates and the direct interbank market. T-bills are auctioned weekly, mostly 91-day papers, though 182 and 364-day bills are also sold in small quantities. The outstanding stock is only 3.6 percent of GDP and is owned mainly by commercial banks, while the share of non-bank investors is less than 2 percent. NBM certificates are currently being offered to banks at pre-announced interest rates in 7-day, 14-day and 28-day maturities. There is virtually no secondary trading in T-bills or NBM certificates. Due to liquidity overhang, both papers are primarily used as short-term investment vehicles, rather than a liquidity management tool. The T-bill market is the smallest with an average monthly turnover of lei 176 million followed by the interbank market at about lei 1.3 billion, which is dominated by overnight and up to 14-day interbank loans. With increased sterilization needs, monthly sales of certificates increased from about lei 550 million in 2006 to more than lei 2 billion in 2007.

15.     Important drawbacks of the Moldovan financial market, that goes back to market development issues, are market segmentation and the incomplete term structure of market

instruments. A very limited number of only short-term maturities distorts the yield curve, which, as noted, is a key component of monetary transmission linking short term interest rates with longer term rates. Although the four main segments - the interbank market, government securities, NBM certificates and bank lending - compete for the same pool of liquidity, the connection between respective interest rates is still weak. The first three - interbank, 91-day T-bill and NBM certificate rates, all of comparable maturities – while exhibiting strong correlation, often significantly diverge and sometimes move in opposite directions (Figure I.2). Starting from May 2006 the T-bill rate has been consistently below the NBM certificate rate (except for a brief episode in January 2007), even though these papers attract the same clientele, commercial banks, which tend to invest in and hold until maturity both of these instruments with the sole purpose of deriving income. Moreover, with longer duration, T-bills are likely to carry higher exchange and interest rate risks, and should, therefore, yield returns at least as high as NBM certificates. This hints at the existence of some degree of market segmentation that could weaken transmission.

**Figure I.2. Interest Rates**
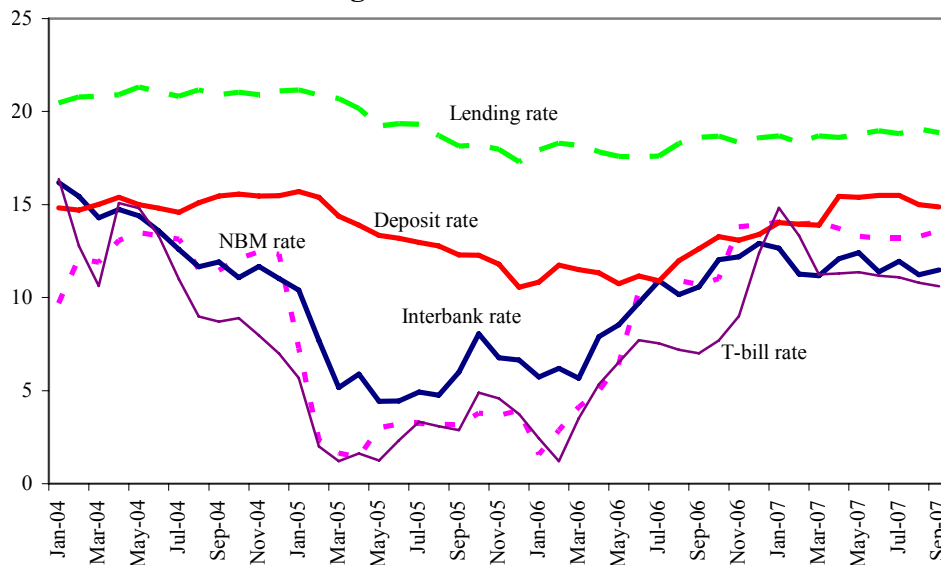


Source: National Bank of Moldova

16.     Lending and deposit rates also appear disconnected from short-term money market rates. The latter declined from as high as 18–20 percent in late 2003 to as low as 2-3 percent in early 2005, and increased again to about 16 percent in 2007. Retail rates, however, remained practically unchanged over the same period.

17.     Apart from undeveloped markets and lack of competition, the disconnect between market and retail rates owes to liquidity overhang in the banking system fuelled by continuous large inflows of remittances. Moldovan banks have been excessively liquid with

the liquidity ratio above 35 percent—one of the highest in the region—most liquid assets being cash and equivalents (Figure I.3).[2] While part of cash balances is precautionary, held voluntarily to meet demand for a large volume of cash transactions, the remaining balances have still been exceeding bank lending needs. Nevertheless, loan rates have not declined, partly because of high inflation and high inherent business and credit risks, but also due to weak competition among banks. Instead, liquidity pressures shifted to T-bills and NBM certificates—the only remaining alternatives to non-yielding deposits at the NBM—pushing their rates down into a negative territory in real terms. With the change in the monetary policy stance from loose in 2004 and 2005 to more tight thereafter, market rates increased. Retail lending and deposit rates, however, proved to be less responsive, and credit growth remained robust. This suggests that liquidity in the system continued to exceed market demand for cash and loans, and that the NBM was sterilizing only a 'leftover'. In other words, short-term market rates remained too low to 'compete' with bank lending weakening the link between market and retail interest rates.

18.     Retail deposit rates did not decline under liquidity pressures and banks continued to attract funds at high rates. Total deposits grew by about 30 percent in 2006. Possibly, the liquidity overhang was perceived as temporary, and pushing for market share, banks were betting on longer-term returns from building reputation and a solid client base.

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[2] Liquidity ratio is defined as a ratio of liquid assets to total assets.

**Figure I.3. Banking Sector Liquidity in Europe**
**(Liquid assets/total assets, percent, 2005)**
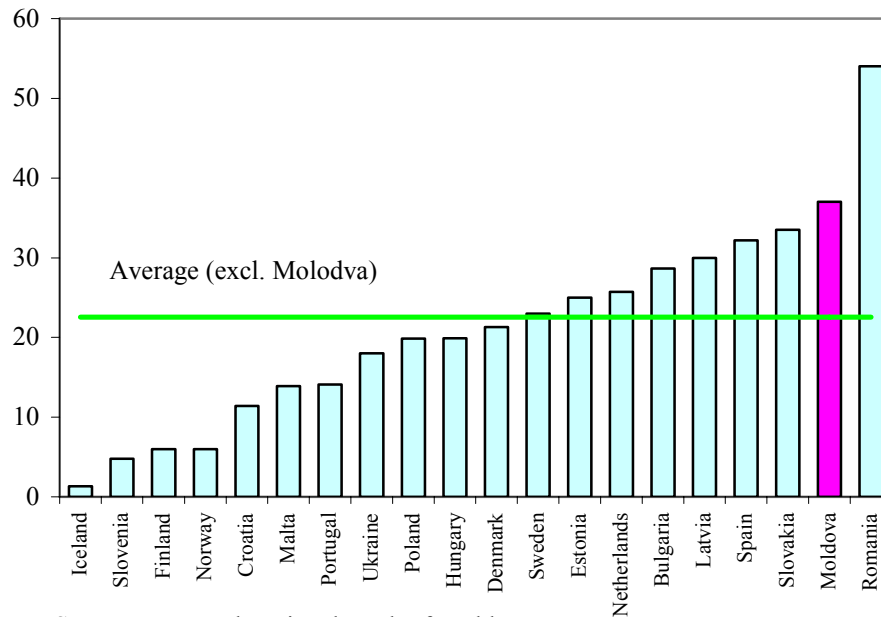


Source: IMF; and National Bank of Moldova.

## D.  Model and Data

19.      This section turns to formal estimation of the strength and the speed of the interest rate pass-through in Moldova. Each stage is modeled separately using monthly data from September 2003 through December 2006. The relationships estimated below appear rather stable over this period, but change considerably and become unstable when the sample is extended to before September 2003 indicating the presence of structural breaks in the series, possibly due to the changing nature of the economy and financial markets. Indeed, even a visual examination of time series shows that from the post-Russian crisis until early 2003 inflation and deposit and lending rates had been steadily and rapidly declining, and the exchange rate depreciating, while from mid-2003 the trend disappeared (Figure I.4). Starting from January 2007, the National Bureau of Statistics of Moldova substantially revised CPI weights introducing another break in price statistics. This period, therefore, is also excluded.

**Figure I.4. Dynamics of Interest Rates, Inflation and Exchange Rate**
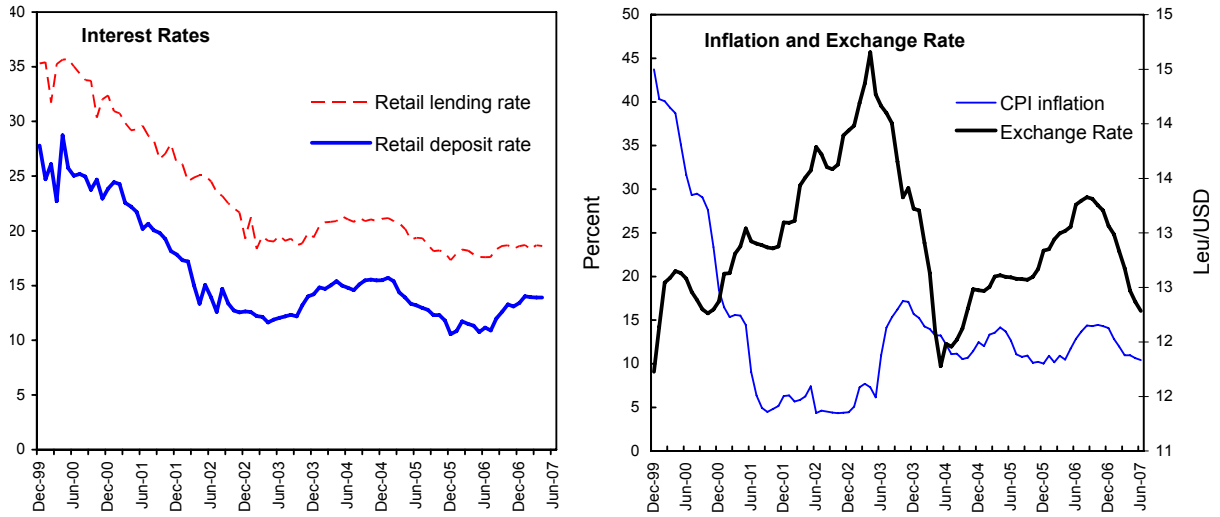


20.     For the first and the second stage of transmission, the following equations were used to establish relationships between monetary policy and market rates, and between market and retail rates:

Stage one:     $i_t^M = \alpha_1 + \beta_1 \cdot i_{t-k}^P + \varepsilon_t$     (1)

Stage two:     $i_t^R = \alpha_2 + \beta_2 \cdot i_{t-j}^M + \omega_t$     (2)

where P, M and R superscripts identify policy, market and retail rates respectively; β1 and β2 are pass-through parameters, $\alpha$1 and $\alpha$2 are constants, and ε and ω denote error terms for each stage correspondingly. t is a time index, while k and j allow for time lags in the transmission process, and characterize the speed of the pass-through.

21.     Interest rates on NBM certificates were used as a policy rate variable $i^P$. As noted, NBM certificates were introduced only in 2005, which would considerably shorten the series and weaken the predictive power of equation (1). To avoid a loss of degrees of freedom, the earlier period was substituted with interest rates from credit auctions, held by the NBM as a main monetary policy instrument at that time. Interbank rates were used for the market rate $i^M$, and average interest rates on outstanding stocks of bank credits and deposits in the domestic currency—for the retail rate $i^R$. Unit root tests confirm that all interest rates are I(1) processes, implying that their first differences are stationary.

22.     The third stage of pass-through is estimated based on the following inflation equation:

$$\pi_t = \eta + \gamma_1 \pi_{t-1} + \gamma_2 er_{t-l_1} + \gamma_3 rm_{t-l_2} + \gamma_4 wage_{t-l_3} + \gamma_5 i^R_{t-l_4} + \delta_t$$     (3)

All variables in the above equation are log-differences of the respective nominal values, where $\pi$ is annual consumer price inflation, and *er, rm* and *wage* are annual changes in the leu/Euro exchange rate, reserve money and average wages in the economy, respectively. $i^R$ is a change in retail interest rates. The average wage is used as a proxy for disposable income. A one-period lagged value of inflation is included in the model to allow for its persistence. $t$ is time, $l^1$ through $l^4$ are time lags, and $\delta$ is an error term. The logarithmic form of equation (3) implies that $\gamma$ coefficients represent respective elasticities, showing a percentage change in inflation in response to a one percent change in a dependant variable.

### E.  Estimation Results

23.      All three stages were estimated with a simple OLS run on stationary differenced variables. Time lags for each stage of transmission were determined individually by running regressions with different values for $k, j$ and $l_1$ through $l_4$, and selecting those that produced best fit and statistically significant coefficient estimates. For the retail rate $i^R$ both deposit and lending rates were used in separate regressions to estimate second and third stages. Estimation results are reported in Table I.1 below for the following lag specifications of equations (1) – (3):

Stage 1:      $i_t^M = \alpha_1 + \beta_1 \cdot i_t^P + \varepsilon_t,$      with $k=0$.

Stage 2:      $i_t^L = \alpha_2 + \beta_2 \cdot i_{t-3}^M + \omega_t,$      for lending rate (L) as $i^R$ with $j=3$.

$i_t^D = \alpha_2 + \beta_2 \cdot i_{t-4}^M + \omega_t,$      for deposit rate (D) as $i^R$ with $j=4$.

Stage 3:      $l_1 = l_2 = 1, l_3 = 4$ for both lending and deposit rates as $i^R$.

$\pi_t = \eta + \gamma_1 \pi_{t-1} + \gamma_2 er_{t-1} + \gamma_3 rm_{t-1} + \gamma_4 wage_{t-4} + \gamma_5 i_{t-8}^L + \delta_t$      for lending rate (L) as $i^R$ with $l_4 = 8$.

$\pi_t = \eta + \gamma_1 \pi_{t-1} + \gamma_2 er_{t-1} + \gamma_3 rm_{t-1} + \gamma_4 wage_{t-4} + \gamma_5 i_{t-9}^D + \delta_t$      for deposit rate (D) as $i^R$ with $l_4 = 9$.

**Table I1. Pass-Through Coefficient Estimates**

| Variable | Stage 1 $i^M$ | Stage 2 $i^L$ | Stage 2 $i^D$ | Stage 3 $\pi$ | Stage 3 $\pi$ |
|---|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 | 5 |
| *const.* | -0.14 | -0.01 | 0.04 | 0.01 | 0.01 |
|  | (-0.82) | (-0.19) | (0.48) | (1.23) | (1.36) |
| $i^P$ | 0.27 |  |  |  |  |
|  | (2.67) |  |  |  |  |
| $i^M_{-3,-4}$ |  | 0.13 | 0.14 |  |  |
|  |  | (2.56) | (2.18) |  |  |
| $\pi_{-1}$ |  |  |  | 0.69 | 0.67 |
|  |  |  |  | (8.19) | (13.69) |
| $er_{-1}$ |  |  |  | 0.04 | 0.04 |
|  |  |  |  | (2.46) | (3.42) |
| $rm_{-1}$ |  |  |  | 0.03 | 0.03 |
|  |  |  |  | (2.88) | (3.51) |
| $wage_{-4}$ |  |  |  | 0.09 | 0.10 |
|  |  |  |  | (3.14) | (4.32) |
| $i^L_{-8}$ |  |  |  | -0.05 |  |
|  |  |  |  | (-1.94) |  |
| $i^D_{-9}$ |  |  |  |  | -0.06 |
|  |  |  |  |  | (-2.48) |

*Note: t-statistics in parenthesis*

## Pass-through to market rates is weak

24.     The first stage of transmission, as expected, is fast ($k$=0) – market rates respond immediately to changes in the central bank rate. However, the pass-through appears rather weak at only 27 percent implying limited effectiveness of monetary policy. In more mature financial markets, the pass-through would normally be considerably higher, and the respective coefficient $\beta_1$ - closer to unity.

25.     The weakness of the pass-through in Moldova confirms that the liquidity overhang, pressure of which appears compounded by a loose stance of monetary policy, undermines transmission. Indeed, sterilization operations at significantly negative real interest rates failed to mop-up excess liquidity, and depressed rates distorted markets and reduced elasticity of demand for short-term funds (Figure I.5).[3] Shallowness of the money market and its

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[3] The policy rate became positive in real terms only in December 2006, which is the last observation included in the sample.

undeveloped infrastructure, and infrequent (once a week) open market operations with no pre-announced calendar further weakened the system's ability to manage and distribute liquidity efficiently. In addition, the perceived uncertainty about monetary policy objectives is likely to have undermined the credibility of the central bank, weakening the signaling function of policy rates. Because of confusion about the consistency of policy actions with its long-term goals, market reaction was also muted and varied depending on the market interpretation of NBM intentions. The compounded effect of these factors translated into disconnection between monetary policy and the interbank market.

**Figure I.5. Real Interest Rates**
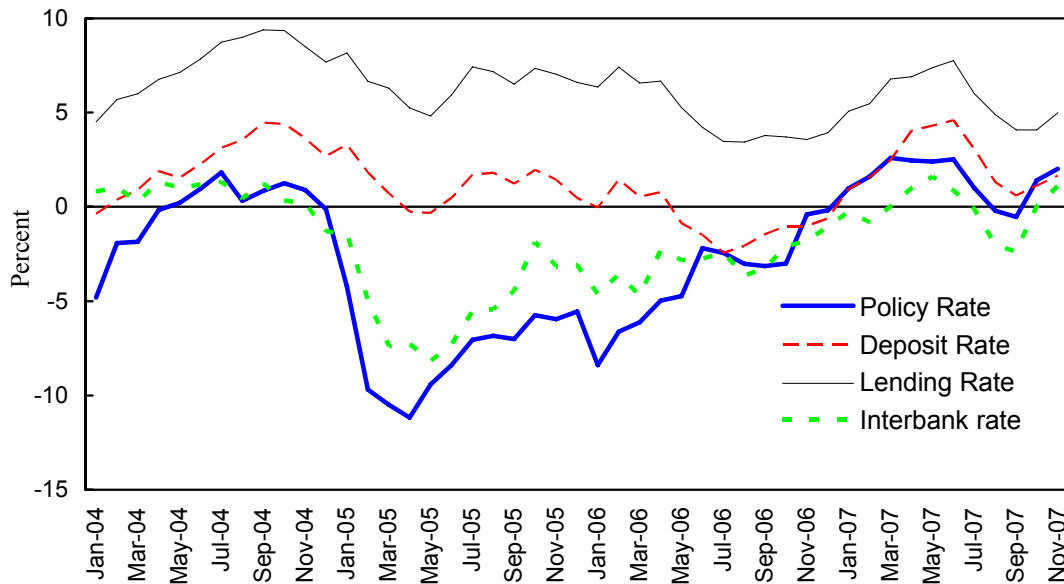


Source: National Bank of Moldova and IMF staff calculations.

26.     From the data point of view, the estimate of pass-through coefficients could have been affected by the inherent inconsistency of the interbank rate $i^M$, which is calculated as a weighted average rate of all monthly transactions. Although the maturity span of the interbank market is not wide, ranging mostly between overnight and 14-days, there has been a noticeable shift towards overnight transactions, which may have resulted in biased estimates of pass-through coefficients.

**Market to retail pass-through is slow and weak**

27.     The results also confirm that transmission from market to retail rates is also weak as anticipated from the visual examination of interest rate charts. The strength of the pass-through is only 13 and 14 percent for lending and deposit rates respectively, and the estimates are not significantly different from each other. It takes 3-4 months for retail rates to react to changes in market rates. Apart from underdeveloped financial markets with its incomplete term structure and excessive liquidity, which distort the yield curve, the lack of

competition in the banking system and imperfect substitutability of short-term instruments for loans and deposits diluted the connection to various degrees.[4]

28.	Figure I.6 below, which plots pass-through estimates by Crespo-Cuaresma, Egert and Reininger (2006) of first and second stages of interest rate transmission for selected European countries, shows that Moldova is a clear outlier with considerably weaker pass-through. In most cases, these countries exhibit noticeably lower liquidity than Moldova (Figure I.3). While some have higher or comparable liquidity ratios, their financial markets are far better developed to efficiently manage and redistribute funds, and central banks in these countries enjoy stronger public confidence and credibility that also strengthen transmission.

**Figure I.6. Pass-Through in Selected European Countries**
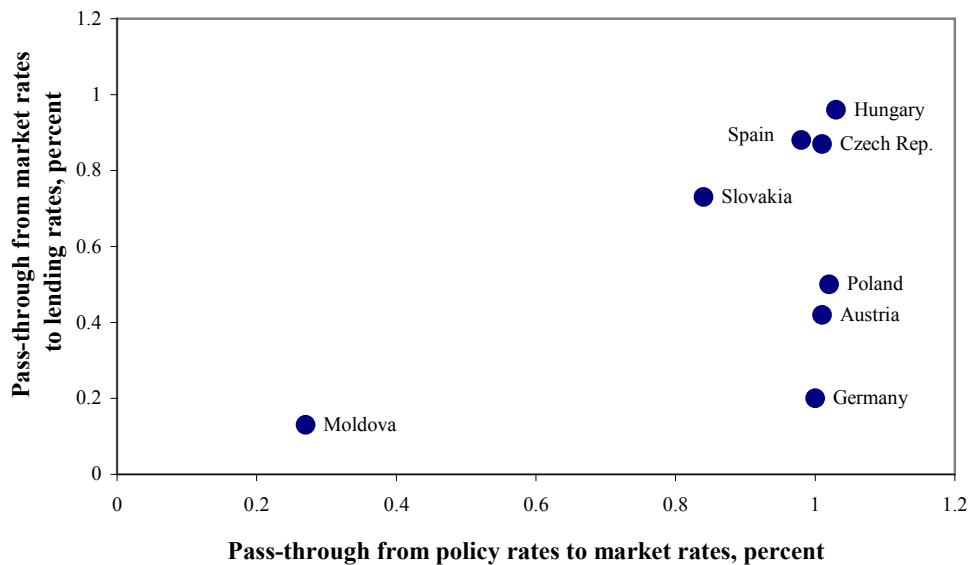


Source: Crespo-Cueresma, J., Egert, B. and Reininger, T. (2006).

### Persistence of inflation is strong

29.	The estimation results of the third and the final stage of transmission provide quantitative insight into determinants of inflation. Both specifications (with deposit and lending interest rates as $i^R$) yield similar parameter estimates, all statistically significant and

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[4] Parameter $\beta_2$ may be underestimating the true magnitude of the pass-through because of a possible measurement error of retail interest rates, which are measured as weighted averages on outstanding stocks. The problem is that stocks include longer-term loans (or deposits), which were contracted by banks before changes in policy rates took place, and could not possibly react to them. A more accurate measure of retail rates would be interest rates on new loans or deposits, but such series were not available.

the signs as expected. Persistence of inflation (measured by $\gamma_1$) is strong—about 67-69 percent of inflation is carried over to the following period. Exchange rate depreciation and reserve money affect prices with a one-month delay having respective elasticities of 4 and 3 percent. The income impact is stronger at 10 percent, but with a time lag of four months. The interest rate pass-through is the slowest with a lag of 8-9 months, and with a coefficient of negative 5-6 percent.

30.     Coefficients $\gamma$ represent short-term elasticities, which capture the first round effects of a one-time change in the respective dependent variable. The presence of inflation inertia (the lagged value of inflation in equation (3)), however, introduces a richer structure allowing calculation of a cumulative effects over time, or long-term pass-through coefficients. By repeated substitution of lagged values of $\pi_{t-n}$ into $\pi_t$ for all $n>0$, the long-term pass-through coefficients can be derived as $\gamma_m/(1-\gamma_1)$, where $m$ identifies a dependent variable in equation (3). Expressed in percentage terms, this coefficient for interest rates equals to negative 16-18 percent. Similarly, the long-term elasticities with respect to the exchange rate, reserve money and wages are 13 percent, 10 percent and 30 percent, respectively.

## F.  Conclusions

31.     This paper is one of the first attempts to examine the interest rate channel of monetary policy transmission in Moldova, and to estimate the strength and the speed of the interest rate pass-through. The whole process of transmission from policy innovation to inflation was divided into three stages: the pass-through from policy to short-term market rates, from market rates to retail deposit and lending rates, and finally from retail rates to inflation.

32.     The estimation results for the three stages imply that the interest rate pass-through is rather weak throughout the whole chain of the transmission process suggesting that effectiveness of monetary policy is limited. For all the reasons mentioned before, the yield curve, which is the key building block of interest rate transmission from policy to retail rates, is distorted. The incomplete term structure of market interest rates results in market segmentation and weakens its ability to channel funds to their best use given the risk-return trade-off.

33.     However, in a rapidly changing environment the strength and the speed of transmission may not remain constant over time, even in the short-run, suggesting that the pass-through could improve if some of the obstacles are removed. Market reaction to policy changes largely depends on its perceptions of the central bank's willingness and ability to achieve the objective of price stability. Therefore, strengthening central bank credibility and independence, openly pursuing the sole goal of inflation by implementing consistent policies, and communicating its intentions in a timely and transparent manner could substantially improve the policy effectiveness. While the recent monetary tightening and the increased policy rates in 2007 (which is not captured by the data sample in this paper) may have eased part of liquidity pressures, further efforts to mop-up liquidity in support of lower inflation

could improve pass-through relationships. In addition, the growing presence of foreign banks in Moldova could intensify competition, bring in fresh capital and banking expertise, and enhance banking intermediation. The links between interest rates would strengthen by expanding the term structure of market instruments and reducing distortions to the yield curve, streamlining monetary policy instruments and improving the money market infrastructure. Over a longer horizon, as economic and financial market development and income growth make saving-investment decisions more sensitive to interest rates, transmission will also strengthen.

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**II.  ZERO CORPORATE INCOME TAX IN MOLDOVA: TAX COMPETITION AND ITS IMPLICATIONS FOR EASTERN EUROPE[5]**

## A.  Introduction

34.     Global economic integration and technological innovations have reduced barriers for flows of capital and labor and intensified tax competition over mobile capital. This led to significant declines in corporate income tax (CIT) rates in Western and Eastern Europe and raised concerns about tax competition and the resulting "race to the bottom". Policymakers, the public and some economists, particularly in Western Europe, have become concerned that reductions in CIT rates may lower tax revenue and force countries to increase other, more distortionary taxes, reduce public investment, and/or cut social spending. This could happen exactly at the time when globalization strengthens demands for social welfare programs and when countries struggle to deal with the growing pressures on pension and healthcare systems owing to ageing. They are also worried that some countries ignore the potentially harmful impact of their decisions on other countries leading to a "beggar-thy-neighbor" polices and driving corporate tax rates below welfare-optimal levels. Finally, an erosion of capital income taxation could undermine the integrity and political legitimacy of the tax system and lead to greater inequality.[6]

35.     Moldova's decision to cut the CIT rate to zero in 2008 is likely to intensify concerns about tax competition, especially as it can encourage other countries in Eastern Europe to lower (the already low) corporate taxes further to attract FDI and mobile profits, improve domestic political standing, or provide a signal of business-friendly policies.[7]

36.     The purpose of the paper is twofold: first, to test the prediction that (i) there is interdependance in CIT rate setting in Eastern Europe and (ii) that the Moldovan zero CIT will intensify tax competition in Eastern Europe, including ten new EU member states (NMS-10), European countries of the Commonwealth of the Independent States (CIS), and transition economies of Southeastern Europe (SEE); second, to discuss the implications of regional tax competition for the flows of foreign direct investment, tax revenues, economic efficiency, equity, and social welfare.

37.     The paper is organized as follows. In sections B and C, the paper discusses if, why, and how countries compete over corporate tax rates. In section D, the paper provides empirical evidence that countries in Eastern Europe strategically respond to changes in CIT

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[5] Prepared by Marcin Piatkowski (EUR) with contributions from Mariusz Jarmuzek and Saida Mamedova (both EUR).

[6] See the literature surveys by Wilson (1999), Zodrow (2003), Fuest (2003), and Devereux and Loretz (2007).

[7] Unlike in Estonia, Moldova kept the standard system of corporate taxation, but reduced the rate to zero. It will continue to tax dividends and non-business expenses. The Moldovan authorities do not rule out raising the CIT rate in the future.

rates in the region and that the Moldovan zero CIT is likely to intensify tax competition. Section E analyzes the implications of tax competition and discusses whether tax coordination would be beneficial. Section F concludes.

## B. Do Countries Compete Over Corporate Taxes?

38. **CIT rates have declined considerably in the last decade.** In Western Europe, mean statutory CIT rates declined from 38 percent in 1995 to 28 percent in 2008; in new EU members states (NMS-10), they fell from 32 percent in 1995 to below 18 percent in 2008. Likewise, CIT rates also fell in CIS and SEE countries (Figure 1).[8] The decline in CIT rates is likely to continue in the near future.[9]

Figure I.1. CIT Rate in the EU-15 and Eastern Europe
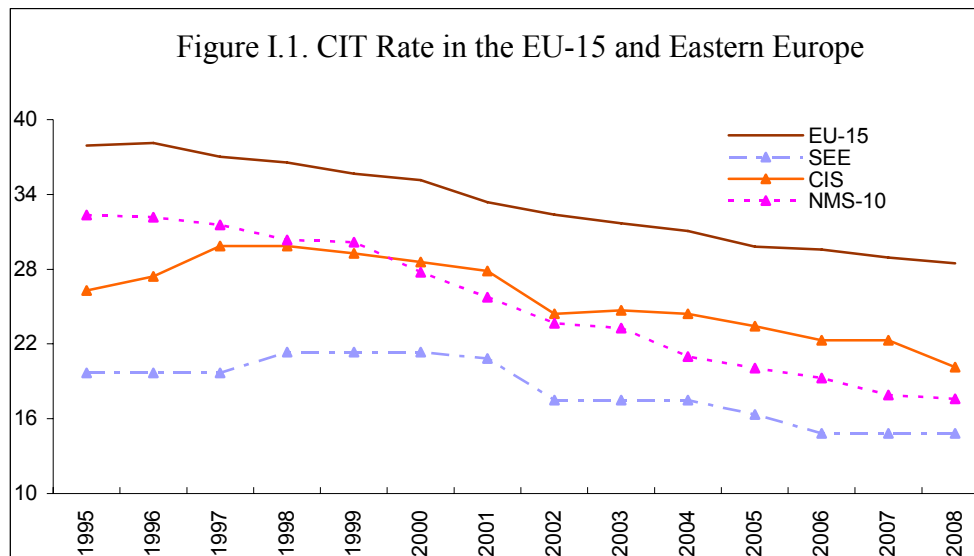
Note: unweighted average. NMS-10 include Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia and Romania. CIS include Azerbaijan, Armenia, Georgia, Moldova, Russia, and Ukraine. SEE include Albania, Serbia, Croatia, and Bosnia and Herzegovina.
Source: PWC Worldwide Tax Summaries, IMF staff reports.

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[8] Unless specified differently, throughout the text CIT rates mean statutory rates.

[9] Ten countries—Bulgaria, Denmark, Netherlands, Portugal, Greece, Germany, France, Spain, Albania, and Italy—will cut CIT rates in 2008. Czech Republic will gradually reduce CIT from 24 percent in 2007 to 19 percent in 2010. The new Polish government considers reducing the CIT rate to 15 percent, down from 19 percent.

39.     **Developed countries interact in setting CIT rates.** There is evidence for interdependent corporate tax setting among industrialized OECD countries and EU-15.[10] Devereux, Lockwood, and Redoano (2005) estimate that during 1982-1999, among the industrialized OECD countries, a one percentage point change in other countries' weighted average statutory CIT rate resulted in a 0.67 percentage point change in the CIT rate in the home country. They find that the results of their model closely predict the actual fall in the CIT rates. These empirical results are confirmed by policymakers who explicitly mention tax competition as a reason for reducing CIT.[11]

40.     **Countries can compete for mobile capital with both rates and tax bases**. The effective tax rates facing businesses depend on the statutory rates and the definition of the tax base; that is, what is considered as revenues and expenses for tax purposes. The are two measures of effective taxes: the effective average tax rate (EATR), calculated as the ratio of future tax liabilities to pre-tax financial profits (in present value terms) over the estimated duration of the investment project, determine the location of investment, while the marginal effective tax rate (EMTR), calculated as the tax wedge between the pre- and post tax return on a marginal investment project that does not yield an economic rent (the return is equal to the cost of capital), affect the size of investments. Statutory CIT rates, however, are most important for highly profitable investment and the direction of profit shifting.[12]

41.     **But competition over statutory CIT rates is more intense than over the tax base**. Devereux, Lockwood, and Redoano (2005) find that among industrialized OECD countries competition over EMTR was weaker than over statutory rates. This was reflected in a much smaller decline in EMTR, driven by base broadening, than in statutory rates. Keen (2007) conjectures that OECD countries competed more with tax rates than with the tax base because lowering rates would prevent profit shifting, while broadening tax bases would ensure higher revenue from the less mobile corporate tax bases. More intense competition over the tax rates may also be due to the fact that small economies have a particularly strong incentive to lower the CIT rate below that of larger countries to attract profits earned abroad without losing much of the domestic tax revenue.[13] In 2007, in line with the theory, small

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[10] Mendoza and Tesar (2005), Redoano (2004), Altshuler and Goodspeed (2002) and Devereux, Lockwood, and Redoano (2005).

[11] For instance, Roland Koch, a negotiator for the Christian Democrat party in Germany, said in 2006 that "There is no disagreement between the coalition parties that we have to tax companies differently than in past decades...(t)oday, we're exposed to international and European tax competition." Carter Dougherty, "Germany to Lower Corporate Tax Rate," *International Herald Tribune-Business* (November 2, 2006).

[12] AETR, which as the weighted average of the METR and the statutory rate, in practice closely follows the statutory rates. For highly profitable investment, marginal EATR is almost equal to the statutory rate: the higher the profits, the more the effective tax rate approaches to the statutory rate.

[13] Well-known tax competition models of Diamond and Mirrlees (1971), Bucovetsky (1991), and Wilson (1991) predict that smaller, open economies should have lower source-based taxes on capital income than larger countries since small countries face the most elastic corporate tax bases.

countries in Europe had indeed much lower statutory tax rates than larger countries (Figure 2).

Figure II.2. GDP and CIT Rates in Europe, 2007

$y = 6.8536x + 9.4713$
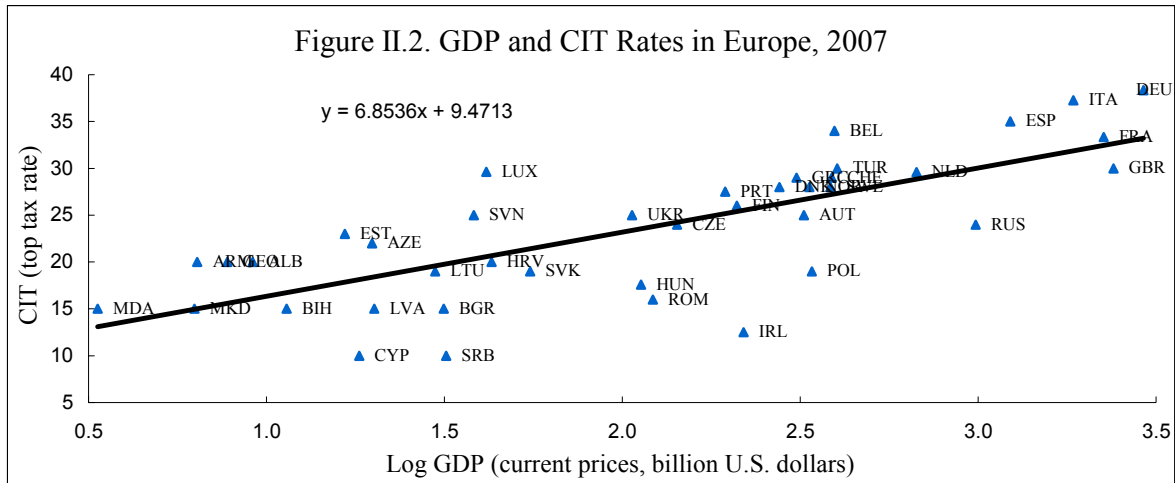


Source: WDI, PricewaterhouseCoopers.

42.     **As a result of the more intense competition over tax rates, internationally mobile investment and profits tend to have a lower tax burden than less mobile corporate activity**. This benefits multinational companies relative to domestic companies with no activities abroad (Hines 2006, Devereux, Griffith, and Klemm 2002). In addition, since multinational companies can much more freely shift profits, they can reduce the overall corporate tax burden even further. The declining CIT rates may reduce the disadvantage for domestic companies, but this may be offset by base broadening focused on taxing less mobile corporate activity with high rates to maintain the level of corporate tax revenue (Keen, 2001). There are indeed indications that large companies in Europe pay lower taxes: Nicodeme (2007) reports, on the basis of firm-level data for 21 EU countries between 1992 and 2004, that there was a negative correlation between the firm size and the effective tax.[14]

## C.  What Drives Tax Competition?

43.     **There are a number of economic factors that affect the degree of tax competition.** Research suggests that while openness tends to increase the intensity of tax competition, transport costs, agglomeration effects, costs of moving capital, the size of countries and similarity among countries also seem to matter, but their impact on tax rates is ambiguous: they can either decrease or increase the equilibrium CIT rate (Devereux and Loretz, 2007). Overall, however, given in particular the reduced trade costs and greater

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[14] Also the smallest companies can be relatively disadvantaged: with declinining CIT rates, the competitive position of some categories of small entreprises enjoying simplified tax treatment, such as, for instance, lump sum monthly tax payments, can worsen.

capital mobility, literature on tax competition predicts that CIT rates should be falling towards a new equilibrium (Devereux and Loretz, 2007).

44.     **Political factors also matter**. In the so-called "yardstick competition", countries respond to changes in CIT in other countries because voters evaluate the performance and economic competence of their governments by comparing home tax rates to those in neighboring countries (Besley and Smart, 2002).[15] Countries can also lower CIT rates to send a signal to foreign investors of their business-friendly policies[16], to emulate perceived success of other countries (Estonian or Slovak tax reforms, for instance) or because they just follow a common intellectual trend. Finally, countries may reduce CIT because they might count on benefits in terms of a country's international image and visibility.[17]

45.     **It is difficult to delineate the specific contributions of political and economic factors to tax competition**. Given the multitude and multidirectional impact of all the factors involved, no one has so far been able to estimate the extent to which political and economic factors separately contribute to competition (Devereux and Loretz, 2007, Griffith and Klemm, 2004, Nicodeme, 2006).

### D.  Will the Moldovan Zero CIT Intensify Tax Competition in the Region?

46.     **Close correlation in the pattern of CIT rate setting in Eastern Europe seems to reflect strategic interaction** (Figure 1). Similarly to OECD countries, changes in CIT rates in Eastern European countries closely followed one another during 1995–2007. The average (unweighted) CIT rate decreased by 0.74 annually in all Eastern European countries during 1995–2006 and by 1.1 percentage points during 2000–08.

47.     **The empirical investigation confirms strategic interaction.** To test the hypothesis that setting CIT rates in Eastern Europe, that is in NMS-10, CIS and SEE countries during 1995–2006 was interdependent, following Devereux, Lockwood, and Redoano (2005) we adopt a panel data approach (see Appendix 1 for details). The results of the regression show that during 1995-2006, while controlling for non-tax factors such as the rule of law, the size

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[15] Devereux, Lockwood, and Redoano (2005) and Redoano (2007) do not find evidence for yardstick competition in corporate taxes in industrialized OECD countries. However, Keen and Lockwood (2007) find evidence that adoption of VAT in some country was more likely the higher the proportion of neighboring countries with a VAT.

[16] Keen, Kim, and Ricardo (2007) emphasize the importance of signaling in explaining the expansion of a flat tax on personal income in Eastern Europe.

[17] Estonia and Slovakia, which introduced wide ranging tax reforms in 2000 and 2004, respectively, were mentioned in international press more often than their neighbors. Under the search item "econ*" in FactivaPlus search engine, during 2000-2006 the five global leading newspapers – The Economist, Financial Times, Wall Street Journal, New York Times, and International Herald Tribune – mentioned Estonia (normalized by the size of population) more than twice as often as Latvia and Lithuania. Slovakia was mentioned twice as often as Poland.

of the country, or the size of government, the changes in the average of other countries'
CIT rate (weighted and unweighted) in Eastern Europe had a strong statistical significance in
explaining changes in CIT rates in individual countries (Table 1). The strength of the
reaction function was also considerable: A one percentage point change in the average of
other countries' statutory CIT rate resulted in a 0.4-0.7 percentage point change in a CIT rate
in a particular country. The strength of the reaction function is similar to that reported by
Devereux, Lockwood, and Redoano (2005) for OECD countries (0.67 for the unweighted
CIT).

Table II.1. Strategic Interaction in CIT Setting in Eastern Europe, 1995–2006

Dependent Variable: CIT rates in Eastern Europe

| Weights | Uniform CIT average | CIT average weighted by GDP |
|---|---|---|
| Average CIT | 0.7213 | 0.4461 |
| | (0.2113)*** | (0.1414)*** |
| PIT | 0.1721 | 0.1785 |
| | (0.0822)** | (0.0778)** |
| GDPD | 0.0029 | 0.0016 |
| | (0.0052) | (0.0052) |
| GGE | 0.1737 | 0.1893 |
| | (0.0867)** | (0.0805)** |
| IMEX | -0.0378 | -0.0436 |
| | (0.0211)* | (0.0213)** |
| LAW | -0.4596 | -0.6073 |
| | (0.5135) | (0.5482) |
| | | |
| R-sq | 0.56 | 0.55 |
| | | |
| No. of observations | 220 | 220 |

Notes: see Appendix 1 for details. Robust standard errors in brackets.

Source: Fund staff calculations.

48.     **The regressions indicate that non-tax factors also affect CIT rate setting**. As
expected, PIT rates affect the CIT rate since the latter acts as a backstop to personal income
taxation. Surprisingly, the size of countries (GDPD)—as measured by GDP—does not seem
to matter, despite the theory suggesting that larger economies could afford higher CIT rates
because a higher proportion of economic activity is purely domestic and thus insulated from
international tax competition. Hines (2006) argues that after 1999 a similar pattern developed
in Western Europe: both bigger and smaller countries reduced CIT rates at the same pace.
This could reflect the growing role of political competition and following of the same
intellectual trends. Public consumption (GGE) matters, as expected, since countries with

larger general government need higher CIT rates to finance higher expenditures. Openness (IMEX)—as measured by the ratio of trade to GDP—is statistically significant, albeit at lower confidence levels and unlike in Devereux, Lockwood, and Redoano (2005), suggesting that more open countries are more exposed to tax competition.[18] Surprisingly, the rule of law (LAW) is not statistically significant, despite high coefficients with the expected signs, suggesting that even more institutionally advanced new EU member states (NMS-10) could not afford to maintain higher CIT rates than the regional average.[19] Coefficients for all statistically significant variables have the expected sign.

49.     **The empirical results suggest that Moldova's zero CIT rate may encourage other countries in the region to reduce CIT further**. These countries may reduce CIT in response to Moldova's cut to remain attractive to foreign direct investment (even though taxes are of only secondary importance to FDI, as discussed below), prevent profit shifting, and give a signal to businessmen and voters of the governments' business-friendly policies (yardstick competition).

50.     **However, the impact on other countries is not likely to be sizeable, at least in the short-term**. Given that Moldova's cut will reduce the (unweighted) regional CIT rate in 2008 by 0.5 percentage points and assuming the same reaction function as for the period 1996-2006, other countries in the region are likely to reduce CIT rates by on average only 0.3-0.4 percentage points.[20] It is not inconceivable, however, that individual countries, such as those located in Moldova's neighborhood or those that are at a similar level of institutional development, could cut rates much faster than what is implied by the average. In a longer perspective, a new round of CIT cuts can—through a feedback effect—feed into new tax cutting cycles, as countries may continue to strategically respond to reductions in corporate taxation in other countries in the region. Should it be the case, the ultimate fall in the CIT rates could of course by much deeper. At this stage, it is difficult to predict if and when this process would stop.

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[18] Clausing (2007c) however finds that another measure of openness— ratio of outward FDI stocks to GDP— matters for CIT setting in 36 OECD and European countries for the period 1979-2002, suggesting that international integration enhances responsiveness of the tax base and provides an incentive to countries to lower tax rates. But greater capital market openness is statistically significant only with 90% confidence and is not statistically significant for other specifications.

[19] Clausing (2007c) results are similar: she finds that EU applicant countries choose rates that are typically eight percentage points lower than other EU and OECD countries, ceteris paribus.

[20] The regression assumes that every country in our sample responds in the same way to the weighted average of statutory CIT rate of the other countries in the sample. This assumption is obviously not too realistic, as countries are likely to respond more to, for instance, CIT cuts in neighboring than in more distant countries or cuts in bigger than in smaller countries. While it would be ideal to estimate the response of each particular country to changes in CIT rate in Moldova, the large number of required parameters would exhaust degrees of freedom and undermine the statistical significance of results.

### E. Implications for FDI, Economic Efficiency, Equity, and Welfare

51.     **Corporate taxes have only a minor impact on FDI**. While at the margin lower taxes affect FDI, empirical evidence suggests that in emerging and developing countries the impact of taxes on FDI, while nonnegligible, is minor compared to the quality of governance, the business climate, the quality of the infrastructure, the size of the domestic market, the distance to main markets in Western Europe, and labor costs.[21] Demekas and others (2005) analyze factors driving FDI in South Eastern Europe, including Moldova. Similarly to other literature, they find that market size, geographical and cultural proximity, relative unit labor costs, infrastructure, and the trade regime matter for FDI. The corporate tax burden also matters, but is not more significant than other factors. Dharmapala and Hines (2006) show that lower taxes matter for FDI only in well governed countries (Figure 3).

Figure II.3. Ratio of US FDI to GDP for Four Groups of Countries
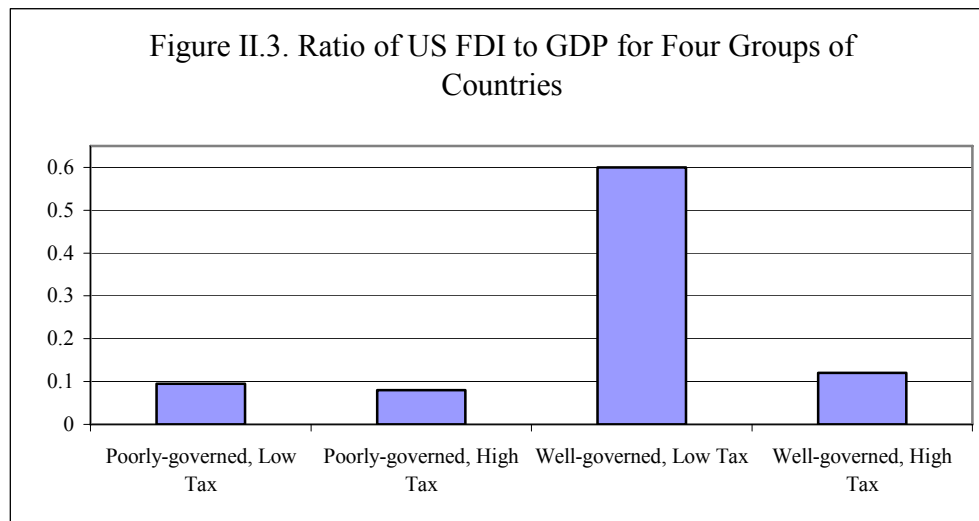


Note: The bars depict mean ratios of assets owned by US firms in 1999 to GDP for four groups of countries: those with below-median governance indices and below-median tax rates, those with below-median governance indices and above-median tax rates, those with above-median governance indices and below-median tax rates, and those with above-median governance indices and above-median tax rates. These medians are calculated for the 60 countries for which data on FDI by U.S. firms are available from the Bureau of Economic Analysis.
Source: Dharmapala and Hines (2006).

52.     **The zero CIT in Moldova is not likely to re-direct FDI flows in the region**. To attract FDI, Moldova—and other countries in the region—should focus on improving its business environment, which—despite recent reforms—lagged behind most its regional peers as reflected in World Bank Doing Business 2008 report (drop from 90 to 92 place relative to 2007 report) and the World Economic Forum 2008 survey (drop from 86 place last year to 97

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[21] See Demekas and others (2005) and McKinsey (2003).

this year).[22] FDI is also not likely to be affected because the current effective tax rate for most foreign companies in Moldova taking advantage of the generous tax exemptions is already close to zero.[23]



Figure II.4. World Bank Doing Business 2008
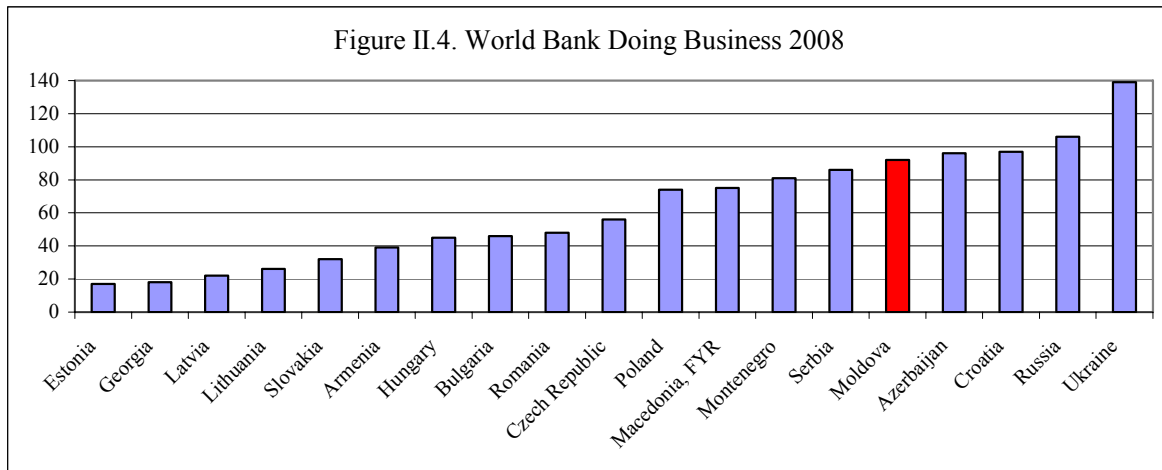
Note: Higher ranking indicates worse business climate.
Source: World Bank Doing Business 2008 report, www.doingbusiness.org

53.     **Declining CIT rates have not so far reduced revenue**. Owing to base broadening, record corporate profits, improved tax administration, and possibly also lower tax evasion, cuts in CIT rates in Eastern Europe have not so far reduced tax revenue (Figure 5). In fact, they have increased from 2.1 percent of GDP in 2000 to 2.7 percent of GDP in 2006. Hines (2006) and others use this evidence to argue that tax competition does not need to lead to reduced revenue and that there is no evidence for "the race to the bottom."

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[22] Business environment is also important for domestic investment: according to a recent business survey in Moldova, the cost of credit, corruption, and a lack of independent court system were considered to be more important obstacles to business development than taxation.

[23] Enterprises with investments in statutory capital or that make capital investments of over US$ 250,000 are entitled to a 50 percent income tax reduction, effective for a period of five consecutive years. Full exemption from corporate income tax is granted to companies entities with investments of more than US$ 2 million, 5 million, 10 million, 20 million or 50 million. The period of exemption depends on the amount, and can be up to seven years if certain conditions are met.

Figure II.5. Eastern Europe: CIT Rate and Revenue
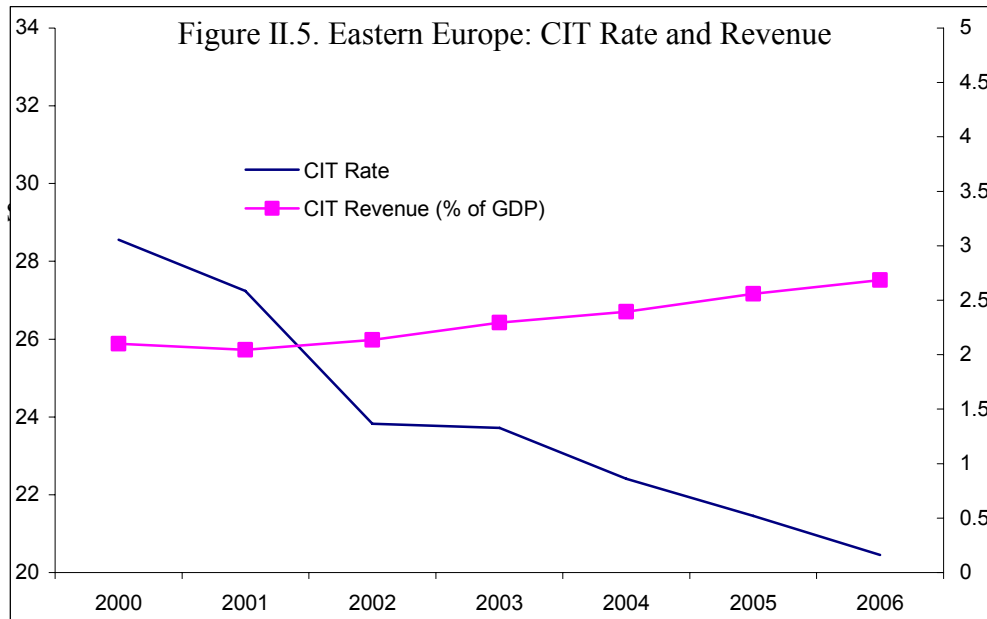
Note: excludes oil producers Azerbaijan and Russia
Source: PWC Worldwide Tax Summaries, IMF staff reports.

54.     **Going forward, however, corporate tax revenue are likely to start falling if CIT rates continue to decline**. This may happen for the following three reasons:

> a) After almost two decades of reforms, there is now a much smaller scope for improvements in tax administration, further base broadening, and reductions in tax evasion (European Commission, 2007b). (Figure 6) provides evidence that in eight NMS countries the tax base was substantially broadened, as reflected in the declining difference between average statutory and effective tax rates.

> b) The share of corporate profits in GDP, reflecting growing profitability of enterprises in Eastern Europe and declining shares of labor income in GDP, measured by the ratio of gross operating surplus to GDP, is now above the historical average and may gradually decline to the historical trend (Figure 7);[24]

> c) CIT rates may soon be below the revenue maximizing rate. The revenue maximizing rate for corporate tax rates in OECD and EU countries, which reflects the parabolic relationship between corporate tax revenues and tax

[24] The fact that despite substantial cuts in statutory tax rates have not led to revenue losses in revenue presents something of a puzzle for both Western and Eastern Europe. See Clausing (2007a), Devereux and Klemm (2002), Keen (2007), Devereux (2007).

rates, is estimated to range from 26 to 32 percent (Figure 8).[25] While there are no similar studies for Eastern Europe, given weaker tax administration, higher openness, and larger scope for tax evasion, the revenue maximizing rate is likely to be lower. The average CIT rate in 2008 in Eastern Europe at 17.6 percent might already be close to the revenue maximizing rate. As a result, the positive supply side effects of CIT cuts are likely to be quickly diminishing and—given the parabolic shape of the curve—tax revenues can start falling at an increasing rate.

**Figure II.6. Statutory and Effective CIT Rates in NMS-8**
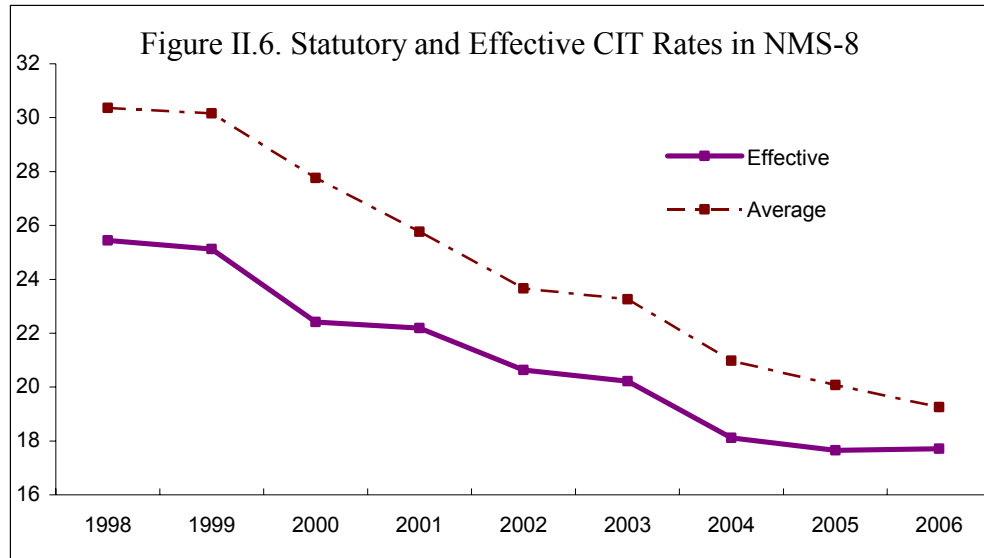


Source: OECD (2007) and Fund staff calculations.

[25] Clausing (2007c) estimates the revenue maximizing rate for corporate tax rates in 36 OECD and EU countries during 1979-2002, including NMS-10. She finds that the average revenue maximizing rate is 32 percent, but is lower for smaller and more open economies. Brill and Hasset (2007) find that for industrialized OECD countries the revenue maximizing corporate tax rate declined to 26 percent in 2006 from 34 percent in the late 1980s. It is important to note that the revenue maximizing rate does not imply that this is the optimal tax rate.

## Figure II.7. NMS-10: Gross Operating Surplus and Mixed Income (percent of GDP, 1995 and 2006)
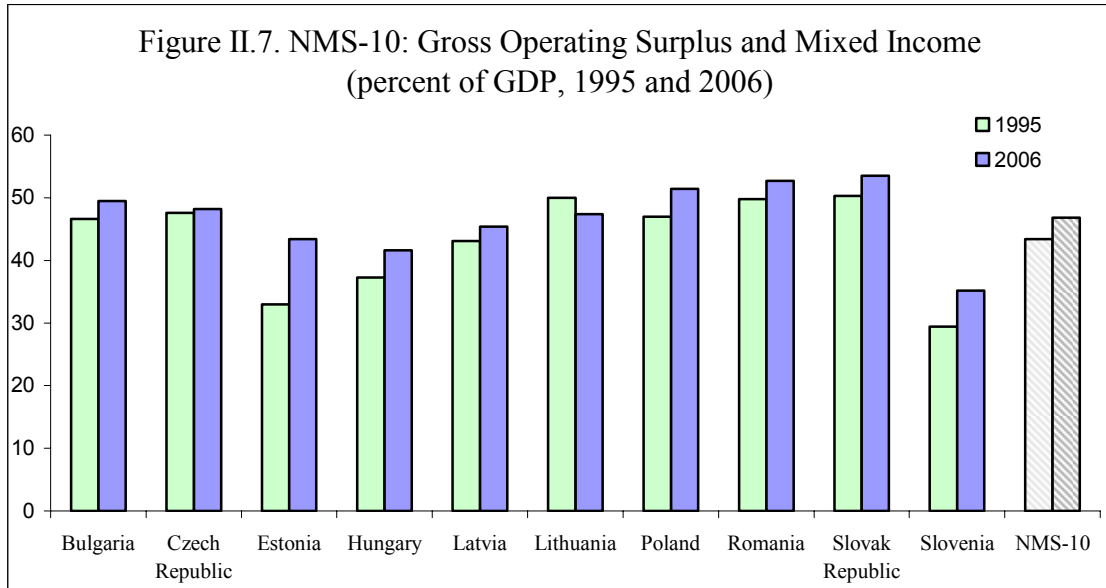


Note: gross operating surplus is defined as the surplus accruing from production before taking account of any interest, rent or similar charges payable or received on financial or tangible non-produced assets borrowed, rented, or owned by the enterprise.
Source: Eurostat and Ameco database.

## Figure II.8. CIT Revenue Maximizing Rate
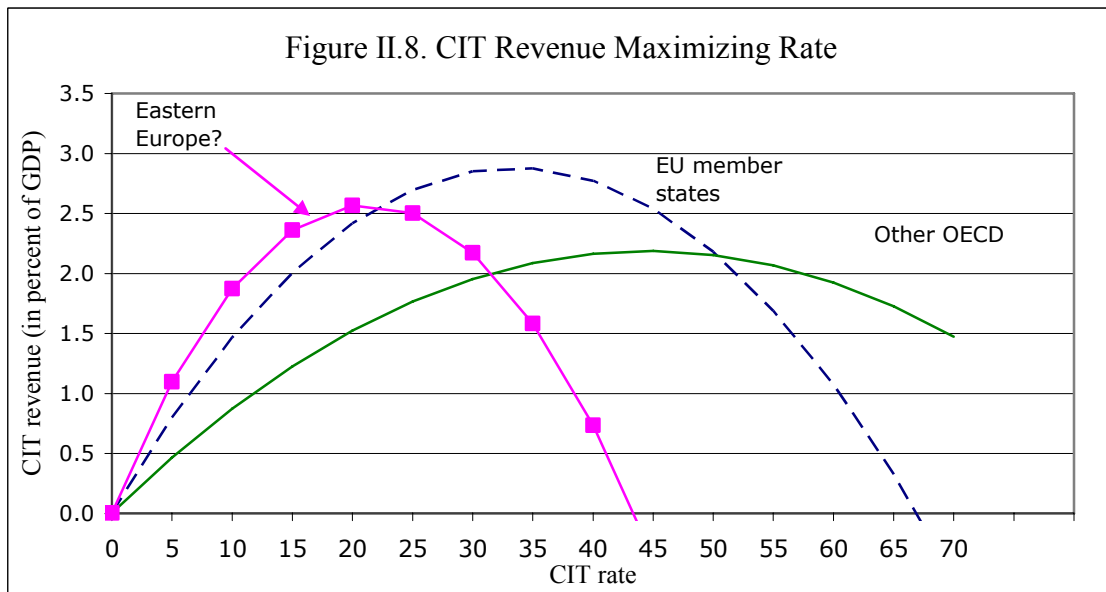


Note: Based on a data set of 36 OECD and European countries between 1979 and 2002.
Source: Clausing (2007c) for the EU-25 and other OECD.

55. **Lower CIT rates may also reduce revenue from personal income tax**. Since positive CIT rates are meant to prevent individual tax payers from incorporating to lower tax

liabilities, lower CIT is likely to increase pressure on reducing personal income tax rates. [26] Indeed, during the last decade CIT and PIT rates have gone hand in hand, suggesting that PIT rates are likely to follow reductions in CIT (Figure 9). In addition, increasing mobility of labor within the EU may also intensify competition in personal taxation to prevent tax-induced labor migration.[27] Finally, competition in personal taxes on their own is also intensifying, as reflected in the expansion of flat taxes on personal incomes in Eastern Europe. As a result, overall revenue from direct taxes can decrease further.



Figure II.9. Eastern Europe: Average CIT and PIT (unweighted)

Source: PWC Worldwide Tax Summaries, IMF staff reports.

56.     **However, revenue losses could be partially offset by profit shifting**. There is a large literature documenting significant profit shifting in Europe among multinational companies.[28] Huizinga and Leuven (2007) argue that profit shifting by multinationals leads to a substantial redistribution of national corporate revenues, especially at the expense of Germany and to the benefit of countries with the lowest tax rates such as Hungary. They estimate that the elasticity of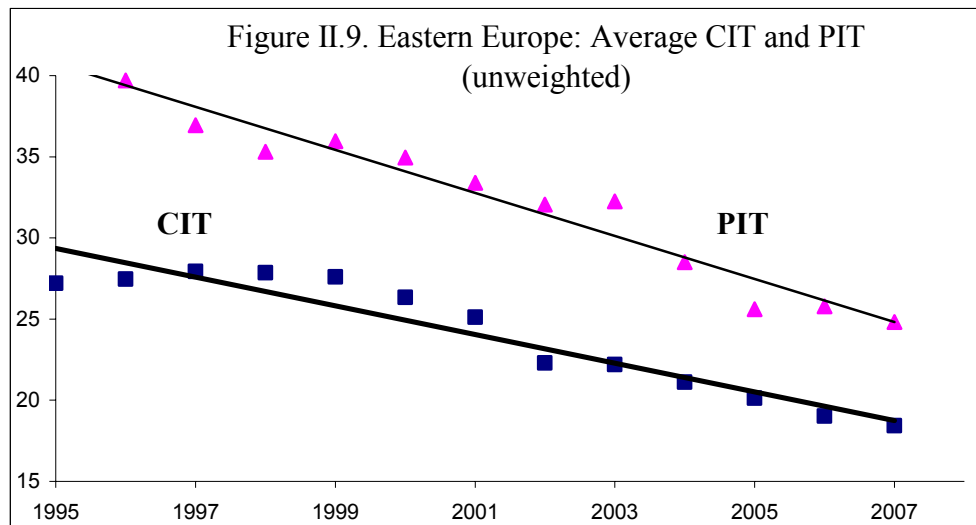 reported profits by multinationals with respect to the top statutory rate amounts to 1.43 percent, that is a one percentage point relative increase in the statutory rate reduces reported profits by 1.43 percent. Bartelsman and Beetsma (2003) provide similar results: in EU-15 a unilateral one percentage point relative increase in the tax rate leads to a at least a 3 percent fall in reported corporate profits. Lower rates in Eastern Europe, unless followed by similar cuts in Western Europe, could thus increase profit

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[26] De Mooij and Nicodeme (2006) argue that the remarkably stable CIT revenues in EU-15 despite declining CIT rates are partly due to shifts from the personal to the corporate tax base as individuals increasingly incorporated. Their simulations suggest that between 10% and 17% of corporate tax revenue in EU-15 can be attributed to that kind of income shifting. Gordon and Slemrod (2000) and Fuest and Weichenrieder (2002) find similar evidence.

[27] By 2011, all EU-15 members have to lift the remaining restrictions on free movement of labor from the new EU member states (longer periods for Bulgaria and Romania).

[28] Bartelsman and Beetsma (2003), Huizinga and Leuven (2007), Huizinga, Leuven, and Nicodeme (2007).

shifting from Western Europe and increase overall tax revenue. The size of potential profit shifting and tax revenue gains is, however, difficult to estimate and more research is needed.[29]

57.     **And by faster long-term growth**. To the extent that declines in corporate taxation improve the efficiency of tax systems (see below) and limit wasteful government spending, long-term growth could accelerate and corporate tax revenue could increase (Hines, 2006). However, Mendoza, Milesi-Ferretti, and Asea (1995), who test the Harberger's superneutrality conjecture, show that while higher tax rates on capital and labor income are associated with lower private investment levels, and higher consumption taxes result in higher investment, the overall impact on growth is likely to be small.

58.     **Lower tax revenue from CIT and PIT, unless offset by expenditure cuts, will need to be replaced with revenue from other taxes**.[30] During 2000-2006, while revenue from direct taxes, PIT and CIT, in NMS-10 and CIS was roughly stable, public spending was increasingly financed with revenue from VAT (Figure 10). If revenue from direct taxes starts falling, the growing role of VAT as a source of revenue is likely to continue. Revenues from social security contributions might also need to increase to finance aging-related expenditures.

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[29] German government estimates that the 2008 corporate tax reform which cuts CIT rate from 38 to 29 percent will stimulate repatriation of profits generating 5 billion Euro (0.2 percent of GDP) of additional revenue (IMF, 2008). Clausing (2007b) estimates that the tax avoidance by US multinationals cost US Treasury about US$ 54 billion in lost revenue in 2002, 37 percent of total corporate tax revenue of $148 billion in that year.

[30] In addition, overall tax revenue is likely to decline owing to the work of "fiscal termites", such as the expansion of tax-free electronic commerce, improving ability of international companies to shift profits to low tax destinations, increasing mobility of labor, and electronic money (Tanzi, 2002). Climate change may add to the weakenining of tax bases owing to its negative impact on output and productivity and higher energy costs. However, revenue losses could be partially offset by revenues from new environmental taxes, such as those on carbon emissions.

Figure II.10. Tax Revenue by Source in NMS-10 and CIS (percent of Total Revenue)
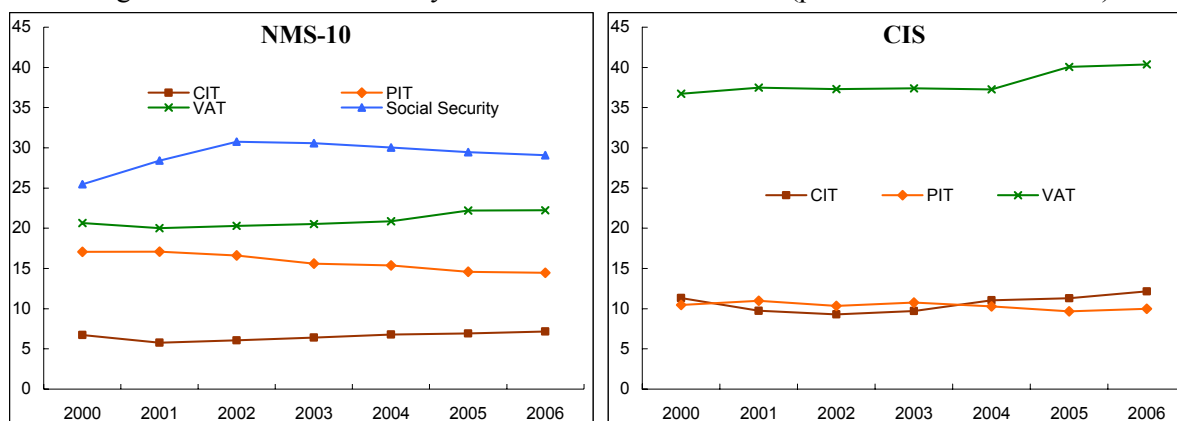


Note: For CIS, oil-producers Russia and Azerbaijan are excluded.
Source: Eurostat and IMF staff reports.

59.     **Increasing role of taxes on consumption is likely to increase economic efficiency**. Tax efficiency is highest in tax systems which minimize distortions to the location and scale of investment, to the sources and uses of finance, and to the choice of legal form. Optimal tax literature suggests that overall deadweight costs of taxation and thus economic efficiency is generally higher if taxes are levied on most inelastic cash flows and least mobile bases, such as labor, consumption, and real estate. This is particularly relevant for small, open economies, such as Moldova, which face the most mobile capital and—in theory—should not tax capital at all (Keen and Simone, 2004). The shift towards VAT may hence increase overall economic efficiency of tax systems.

60.     **But it may be partly offset by more distorting labor taxes**. Recent empirical literature suggests that labor tends to be more elastic than previously thought and therefore taxing labor can be as distortionary as taxing capital (Penalosa and Turnovsky, 2005). Taxes on labor, such as social security contributions, could be even more distortionary than taxes on capital if one considers the negative impact of taxes on labor on the level of employment and thus on growth.[31] World Bank (2007) argues that a high tax wedge, which reflects combined burden of social security contributions and personal income taxes, is one of the major factors explaining while employment ratios in most NMS-10, especially for the low-skilled, are lower than the EU-15 average.

61.     **The shift in the composition of tax revenue may have adverse distributional consequences**. VAT and social security payments tend to be regressive, particularly when the latter are capped at a certain multiple of the salary.[32] In addition, high payroll taxes tend

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[31] Peñalosa and Turnovsky (2005) argue that in developing countries with a large informal economy taxing capital more heavily than labor income could be optimal.

[32] In practice, VAT is often only mildly regressive, as argued by Moore (2005) for Slovakia, Dalsgaard (2007) for the Czech Republic and Newhouse and Zakharova (2007) for the Philippines. Moreover, given the fact that richer households tend to find it easier to evade taxes on capital than on consumption, increasing taxation of the latter can be progressive. Furthermore, poorest households in Eastern Europe tend to procure goods in informal

(continued…)

to disproportionately discourage employment of low-skilled labor from the poorest households (World Bank, 2007).To the extent that the declining corporate tax revenue is replaced with revenue from VAT and payroll taxes, the progressivity of tax systems may diminish.[33]

62.      **The size of any negative distributional effects is hard to establish, but is not likely to be substantial**. While VAT and payroll taxes are likely to be negative for equity, it is not clear who benefits from a lower burden of the corporate tax: lower taxes on capital may either increase real wages and/or increase returns for capital owners.[34] In any case, the distributional effects of the shift in the composition of tax revenue is not likely to be large, given that CIT revenue only slightly exceeds 5 percent of total revenue in NMS-10, CIS and SEE (Figure 10). In the end, the degree of progressivity is dependant on both taxes and expenditures, where the former tend to have only a limited role.

63.      **It is not clear how corporate taxation affects social welfare through public spending**. Welfare increases if government expenditures have utility or production benefits higher than the deadweight loss from taxation. Keen (2007) argues that the citizens' welfare increases if and only $\lambda < MDL/(1+ MDL)$, where $\lambda$ is the proportion of public expenditure that is wasted and $MDL$ is the marginal deadweight loss from raising an additional unit of revenue from corporate taxes. If the marginal deadweight loss from corporate taxation is, say, 15 percent, and if the proportion of waste in marginal public expenditure does not exceed 13 percent, then welfare would increase if CIT rates stopped declining (Keen, 2007).[35]

64.      **Tax coordination could prevent CIT rates from falling below the welfare-optimal level**. Tax coordination could take a form of an explicit agreement among countries to coordinate changes in corporate taxes (or any taxes for that matter) or through setting minimum CIT rates. The EU already set a precedent: it requires that in all member states the standard VAT rate does not fall below 15 percent. Minimum rates could limit any 'race to the bottom,' while leaving some leeway for national discretion in tax-setting. Even countries required to raise tax rates could benefit from the adoption of a minimum tax: this is because

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markets, where goods and services are not taxed at all. Finally, VAT helps reduce intergenerational inequities as it taxes both past and present earnings (Dalsgaard, 2007).

[33]Since CIT tends to be a much more important source of funding for social welfare spending in developing countries, they can be particularly exposed to adverse distributional impact of declining CIT revenues (Keenand Simone, 2004).

[34] Kotlikoff and Summers (1987) argue that part of the burden of corporate taxation can be shifted to consumers in the form of higher prices, and the extent of this shifting is hard to estimate. Piketty and Saez (2006) argue that the the progressivity of the U.S. federal tax system for top income earners has declined dramatically since the 1960s mostly due to a drop in the corporate tax burden.

[35] Keen and Marchland (1997) argue that competition for mobile capital may also distort the composition of public spending, with too much spending on infrastructure and too little on items benefiting the consumers – "too many airports, not enough libraries".

when they raise their rates, countries with high tax rates would be less threatened by low rates in other countries and thus be more likely to set higher rates than in a scenario without a minimum tax. The higher rates in high tax countries would reduce the damage to countries forced to raise their rates. In fact, they could even benefit from it. In this way, imposing a minimum rate may be Pareto-improving (Keen, 2007).

65.     **But gains from tax coordination—if any—would not be substantial**. Mendoza and Tesar (2005) argue that any gains in tax coordination among the biggest EU countries would be modest: it could add only up to 0.26 percent to lifetime consumption and such small benefits may not exceed the costs of tax coordination. Likewise, Brochner and others (2006) in their study of tax coordination in EU-25 find only modest aggregate welfare gains owing to tax coordination and caution that specific features of any coordination mechanism are important and economic gains can not be taken for granted. Sorensen (2004) estimate that EU-average welfare gains from tax coordination could amount to 0.95 percent of GDP (higher if marginal public revenue is spent on public goods rather than on social transfers).[36] There are no similar studies for Eastern Europe, although Keen (2007) argues that the case for tax coordination in developing countries could be stronger given the larger impact of CIT rates on revenue.[37] But all of this discussion ignores the fact that tax coordination could be very difficult politically and be open to competition from countries from outside the agreement.[38]

## F.  Conclusions

66.     Further economic integration in Europe, increasing capital mobility, and the fact that it will be increasingly difficult and costly to maintain complex national taxes on ever more mobile capital, are likely to continue to drive the decline in CIT rates in Eastern Europe and—through increased tax competition pressures—also in Western Europe. The paper provides the first empirical evidence that there is a strategic interaction in setting the CIT rates in Eastern Europe, and by implication that the Moldovan zero CIT may encourage a further decline in CIT rates in the region.

67.     Falling CIT rates are not likely to lead to a significant re-direction of FDI flows in CIS and SEE countries, as other factors such as the institutional environment are much more important for attracting FDI (taxes could, however, be relatively more important for attracting FDI into new EU member states). But, as discussed above, CIT cuts in any

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[36] He also finds that welfare gains for the poorest households would be higher than for the median voter. See also Nicodème (2006).

[37] Keen (2007) argues, however, that while governments do not cooperate explicitly, given that the tax-setting game between them is played repeatedly, they may find ways to cooperate tacitly and so avoid inefficiencies.

[38] See Sørensen (2004), Eggert and Haufler (2006), and Brøchner and others (2006). The latter discuss the conflicts of interest which make further corporate tax coordination in the EU rather unlikely at the present stage of political integration. They argue, for instance, that the unanimity rule for tax policy decisions within the EU has made it very difficult to reach any significant degree of coordination of corporate income taxation.

particular country are likely to be followed by other countries in the region, further reducing the relative importance of taxes. To tangibly increase FDI, Moldova and other countries in the region should accelerate structural reforms aimed at improving the quality of the business climate, including through enhancing the protection of property rights, reducing corruption, and improving the quality of public services. Lower CIT, while helpful at the margin, will not be a panacea.

68.     Falling CIT rates are likely to eventually reduce revenue from taxes on corporate income in the future, which—unless offset by cuts in expenditures—will need to be replaced with revenue from taxes on consumption and labor. While the shift towards taxing consumption, mainly VAT, may increase economic efficiency, increasing taxation of labor may decrease it. The shift in the composition of taxation may also have negative distributional effects, although the impact is not likely to be significant given the small share of corporate tax revenue in total tax revenues in Eastern Europe. In any case, any such negative impact could be offset by, for example, improved targeting of social assistance. In general, structural reforms aimed at increasing the efficiency of public spending could lower the incentive for reducing CIT rates, as long as government expenditures achieve utility or production benefits higher than the deadweight loss from taxation.

69.     There is no consensus on whether tax competition and resulting cuts in CIT rates are beneficial or not. Some argue that lower rates will improve the country's competitiveness and lower revenue will force governments to eliminate wasteful expenditure, thus contributing to faster long-term growth. However, others counter that tax competition has already gone too far, undermining public investment and social spending. It therefore needs to be controlled, through, for instance, European-wide tax coordination. But benefits of corporate tax coordination may not be significant, particularly relative to its cost. Tax coordination may also be difficult to implement because of political sensitivity as well as the fact that tax coordinating countries may find themselves vulnerable to tax competition from countries outside the agreement. As of now, there is no consensus in the EU or in Eastern Europe about the desirability of limiting tax competition, not to mention the details of any agreement.

70.     Without tax coordination, can corporate taxation ultimately disappear? On the one hand, competition may stop if governments become reluctant to give up all corporate tax revenue. They may also realize that declining corporate taxation will affect foreign and domestic investment less and less and thus further cuts would be unproductive. On the other hand, however, there will always be countries with an incentive to lower their corporate tax rates below those of their neighbors to attract investment and profits. And voters may continue to demand ever lower taxes and associate economic competence with tax-reducing reforms, causing governments to continue reducing taxes. On balance, it is unclear what exactly could stop corporate taxes from falling further. Thus it can not be excluded that corporate tax rates could ultimately decline to zero, particularly in small countries facing the same incentives as Moldova.

**Appendix**

**Data description**

71.    The empirical results are based upon an unbalanced panel of 23 countries spanning the period 1995 through 2006. The countries included in the sample are Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Bosnia, Croatia, the Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Moldova, Poland, Romania, Russia, Serbia, the Slovak Republic, Slovenia, and Ukraine. The panel consists of two main components: tax variables and non-tax variables. The former contain the dependent variable defined as a statutory CIT rate and explanatory variables such as the average unweighted CIT rate, average CIT rate weighted by GDP, and PIT rate. Both unweighted and weighted averages of CIT rate are calculated in such a way that leave out a particular country's statutory rate. Non-tax variables include the size of the country, government consumption, openness, and strength of institutions.

72.    The first tax variable, the average CIT rate,  is defined as the average for all the countries in analysis with uniform weights. The second tax variable, the average CIT rate, is weighted by GDP. PIT rates are defined as top marginal income tax rates. The size of the country is expressed by GDP in current US dollars, whereas government consumption is defined as the share of general government expenditures to GDP. Openness is proxied by a sum of imports and exports to GDP. The rule of law is represented by the index compiled by the World Bank experts.

| Variable | Acronym | Source |
|---|---|---|
| Corporate Income Tax Rate (percent) | CIT | PriceWaterhouse Coopers |
| Average Corporate Income Tax Rate (percent) | CITUNI | Own calculations |
| Average Corporate Income Tax Rate weighted by GDP (percent) | CITGDP | Own calculations |
| Personal Income Tax Rate (percent) | PIT | PriceWaterhouse Coopers |
| Gross domestic product, current prices, U.S. dollars | GDPD | WEO |
| General gov. expenditure (% of GDP) | GGE | WEO |
| Exports and Imports (% of GDP) | IMEX | WEO |
| Rule of law (rank) | LAW | World Bank World Governance Indicators |

**Data statistics**

|  | CIT | PIT | GDPD | GGE | IMEX | LAW |
|---|---|---|---|---|---|---|
| Mean | 26.2 | 33.1 | 58.4 | 37.8 | 106.1 | 11.7 |
| Median | 25.0 | 35.0 | 21.2 | 38.2 | 100.9 | 12.0 |
| Maximum | 41.0 | 60.0 | 984.9 | 56.6 | 219.0 | 19.0 |
| Minimum | 10.0 | 10.0 | 1.2 | 14.5 | 32.4 | 4.0 |
| Std. Dev. | 6.7 | 10.7 | 116.7 | 8.2 | 42.6 | 3.6 |
| Skewness | 0.2 | -0.1 | 4.5 | -0.6 | 0.5 | -0.2 |
| Kurtosis | 2.6 | 2.4 | 28.4 | 3.3 | 2.5 | 2.1 |
| Observations | 220 | 220 | 220 | 220 | 220 | 220 |

**Econometric methodology**

73. We employ the theoretical model developed by Devereux, Lockwood, and Redoano (2005), based on panel data methodology, controlling for unobserved individual heterogeneity that is constant over time, The econometric model takes the following form:

$$y_{it} = \beta x_{it}^{'} + \eta_i + v_{it} \tag{1}$$

where $x$ represents a vector of explanatory variables, the $\eta_i$ are the unobserved constant individual effects, $v_{it}$ is the error term, and $i = 1,\dots,N$; $t = 1,\dots,T$.

There are two main specifications that address the issue of individual effects i.e. random effects and fixed effects. In the generic model of the form:

$$y_{it} = \beta x_{it}^{'} + u_{it} \tag{2}$$

$$u_{it} = \eta_i + v_{it} \tag{3}$$

it is assumed that

$$E(v_{it}) = 0; E(v_{it} \mid x_{it}) = 0$$

The random effects model assumes also orthogonality of individual effects $\eta_i$ and regressors $x_{it}$:

$$E(\eta_i) = 0; E(\eta_i \mid x_{it}) = 0$$

This implies the following:

$$E(y_{it} \mid x_{it}) = \beta x_{it}^{'} + E(\eta_i \mid x_{it}) + E(v_{it} \mid x_{it}) = \beta x_{it}^{'} \tag{4}$$

74.     The model therefore assumes that explanatory variables are strictly exogenous and no dynamics are included but that individual effects are present. Under these circumstances the ordinary least squares (OLS) estimator is unbiased, but it is not efficient because it does not take account of the dependence of the error term within individual over time. Nonetheless the random-effects (RE) estimator allows us to estimate parameters efficiently. The fixed-effects (FE) estimator assumes that the unobserved individual effects are correlated with the regressors $E(\eta_i \mid x_{it}) \neq 0$. This implies that:

$$E(y_{it} \mid x_{it}) = \beta x_{it}^{'} + E(\eta_i \mid x_{it}) \neq \beta x_{it}^{'} \tag{5}$$

75.     Therefore, neither the OLS estimator nor the RE estimator is unbiased and consistent. Under these circumstances, one should employ the FE estimator that includes a separate intercept for every individual. The Hausman test is conducted to choose between the FE estimator and the RE estimator.

**Results**

76.     The are two specifications used in the empirical investigation. The first includes a uniform average CIT rate:

$$cit_{it} = \beta_1 cituni_{it} + \beta_2 pit_{it} + \beta_3 gdpd_{it} + \beta_4 gge_{it} + \beta_5 imex_{it} + \beta_6 law + \eta_i + v_{it} \tag{6}$$

whereas the second includes a weighted by GDP average CIT rate:

$$cit_{it} = \beta_1 citgdp_{it} + \beta_2 pit_{it} + \beta_3 gdpd_{it} + \beta_4 gge_{it} + \beta_5 imex_{it} + \beta_6 law + \eta_i + v_{it} \tag{7}$$

77.     In both specifications based on the OLS not all variables are statistically significant but all have a sign in line with expectations. However, the problem with the OLS is that it

does not allow for heterogeneity in the sample, which leads us to employ both the FE and the RE estimators. In the specification with uniform CIT rates both the FE and the RE estimators give results that are predominantly in line with expectations, although neither the size of the country nor openness seems to matter. PIT rates, government consumption, the quality of institutions and infrastructure turn out to be statistically significant. In the specification with CIT rates weighted by GDP based on both the FE and the RE estimators the results are similar to those obtained based on the specification with uniform CIT rates with the exception of the magnitude i.e. the weighted average of CIT gives smaller coefficient.

| | OLS | FE | RE | OLS | FE | RE |
|---|---|---|---|---|---|---|
| weights | | uniform | | | GDP | |
| average CIT | 0.9038 | 0.6154 | **0.7213** | 0.5074 | 0.4141 | **0.4461** |
| | (0.2215)*** | (0.2311)*** | **(0.2113)*** | (0.1573)*** | (0.1667)** | **(0.1414)*** |
| PIT | 0.1927 | 0.1446 | **0.1721** | 0.1984 | 0.1450 | **0.1785** |
| | (0.0802)** | (0.0913) | **(0.0822)** | (0.0795)** | (0.0880) | **(0.0778)** |
| GDPD | -0.0109 | 0.0065 | **0.0029** | -0.0186 | 0.0077 | **0.0016** |
| | (0.0058)* | (0.0064) | **(0.0052)** | (0.0069)** | (0.0067) | **(0.0052)** |
| GGE | -0.0021 | 0.2623 | **0.1737** | 0.0156 | 0.2695 | **0.1893** |
| | (0.1051) | (0.1167)** | **(0.0867)** | (0.1067) | (0.1137)** | **(0.0805)** |
| IMEX | -0.0016 | -0.0592 | **-0.0378** | -0.0117 | -0.0582 | **-0.0436** |
| | (0.0183) | (0.0341)* | **(0.0211)* | (0.0211) | (0.0357) | **(0.0213)** |
| LAW | -0.1850 | -0.2886 | **-0.4596** | -0.3295 | -0.3584 | **-0.6073** |
| | (0.6879) | (0.5271) | **(0.5135)** | (0.7375) | (0.5363) | **(0.5482)** |
| R-sq | 0.42 | 0.56 | 0.56 | 0.38 | 0.55 | 0.55 |
| No. of observations | 220 | 220 | 220 | 220 | 220 | 220 |

Note: * Significant at the 10 percent level, ** significant at the 5 percent level, *** significant at the 1 percent level. Standard errors are robust to both autocorrelation and heteroskedasticity

78.     The Hausman test is subsequently conducted to examine which of these two estimators should be employed. The results for uniform CIT rates and for weighted CIT rates suggest that the RE specification is preferred. However, one has to be careful while interpreting the results obtained from the Hausman test when a cross-section dimension is not large, as it is the case in this analysis. Nonetheless, both estimators give similar qualitative results.

Hausman test: specification with CIT unweighted

| Test Summary | Chi-Sq. Statistic | Prob. |
|---|---|---|
| Cross-section random | 11.86 | 0.17 |

Hausman test: specification with CIT weighted by GDP

| Test Summary | Chi-Sq. Statistic | Prob. |
|---|---|---|
| Cross-section random | 7.08 | 0.31 |

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### III. CHANGES AND FLEXIBILITY IN THE MOLDOVAN LABOR MARKET[39]

#### A. Introduction

79.     **Moldova is in the process of economic and labor market restructuring, increasingly mirroring earlier transition economies.** The process has entailed a net loss of about a quarter of the workforce and has had a profound impact on the labor market. While increasing the supply of labor in some sectors of the economy and thus containing wage growth, it has also led to substantial emigration and higher productivity.

80.     **As the reallocation of labor among sectors is increasingly coming to an end, real wage growth can be expected to increase more rapidly in the future—speeding up both the convergence process as well as the urgency to ensure flexibility in the labor market.** Our analysis shows that while overall real wage developments are broadly in line with fundamentals, emigration has functioned as a short-term "shock-absorber" for the economy as a whole and for the industrial sector in particular. As the labor market gradually tightens in the future, the short-term wage setting mechanism will probably change making it essential to preserve flexibility of wages in order to ensure a close link with productivity.

81.     **Population and labor statistics have been substantially revised following the 2004 population census, improving data reliability but complicating an in-depth analysis of recent trends.** While the methodology, training and practices of surveyors have improved, the most substantial revision was the expansion of sampling, thus achieving a more accurate reflection of population dynamics as well as the labor market. As no comprehensive attempt has been made to revise the old series based on new data, there is a break in the sample for some of the variables used in this analysis.

#### B. Some Stylized Facts

82.     **The ongoing restructuring of the Moldovan economy is similar to what other transition economies experienced some years ago** (Figure III.1)**.** Throughout the 1990s, agriculture remained GDP above 25 percent of GDP, while other sectors saw only modest changes. Since then agriculture's share of GDP has fallen by half, while services and construction have expanded rapidly. Industry has remained stagnant as a share of GDP, but this masks substantial intra-sectoral changes as traditional industries have declined while especially export-driven manufacturing industries have expanded.

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[39] Prepared by Johan Mathisen (EUR).

Figure III.1. Economic Structure

(Shares of GDP, Value Added)
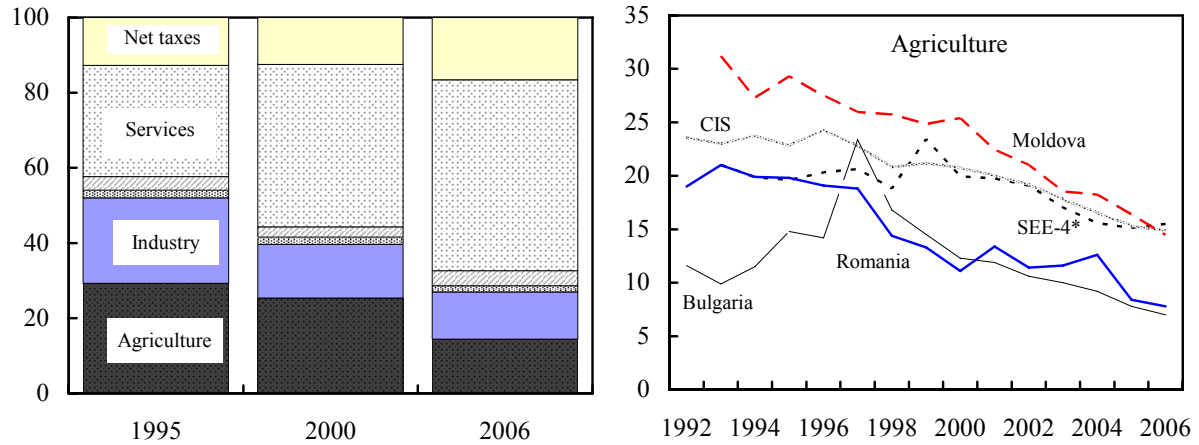


Composition of Industrial Production Index
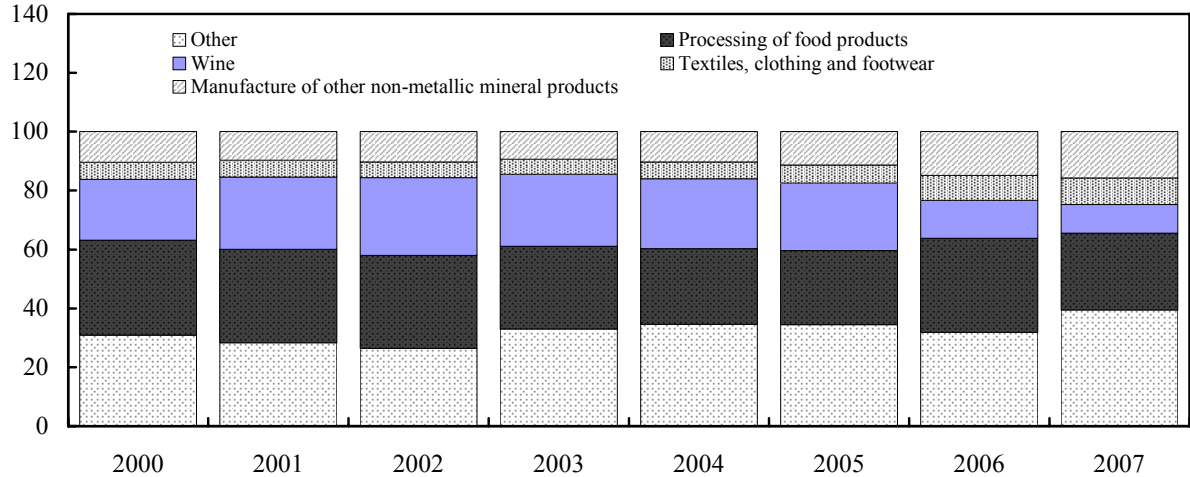


Sources: National Bureau of Statistics, EBRD and Eurostat.
 * SEE-4 = Serbia, Albania, Bosnia, and Macedonia FYR.

83.     **Moldova's population dynamics and participation in economic activity have changed as well** (Figure III.2). In the 1990s, the natural rate of growth of population was positive, emigration levels were relatively low, and economic participation levels were high. More recently birth rates have sharply declined and emigration has increased leading to an 8 percent fall in population since 2000. Partly because most emigrants are mainly of working-age, the economic participation rate (labor force as share of working age population) fell sharply and has now reached Romania's level. Eventually the rate might improve slowly—as seen in some of the early transition countries—as the lower birth cohorts enter working age.

Figure III.2. Population and Overall Labor Market Developments
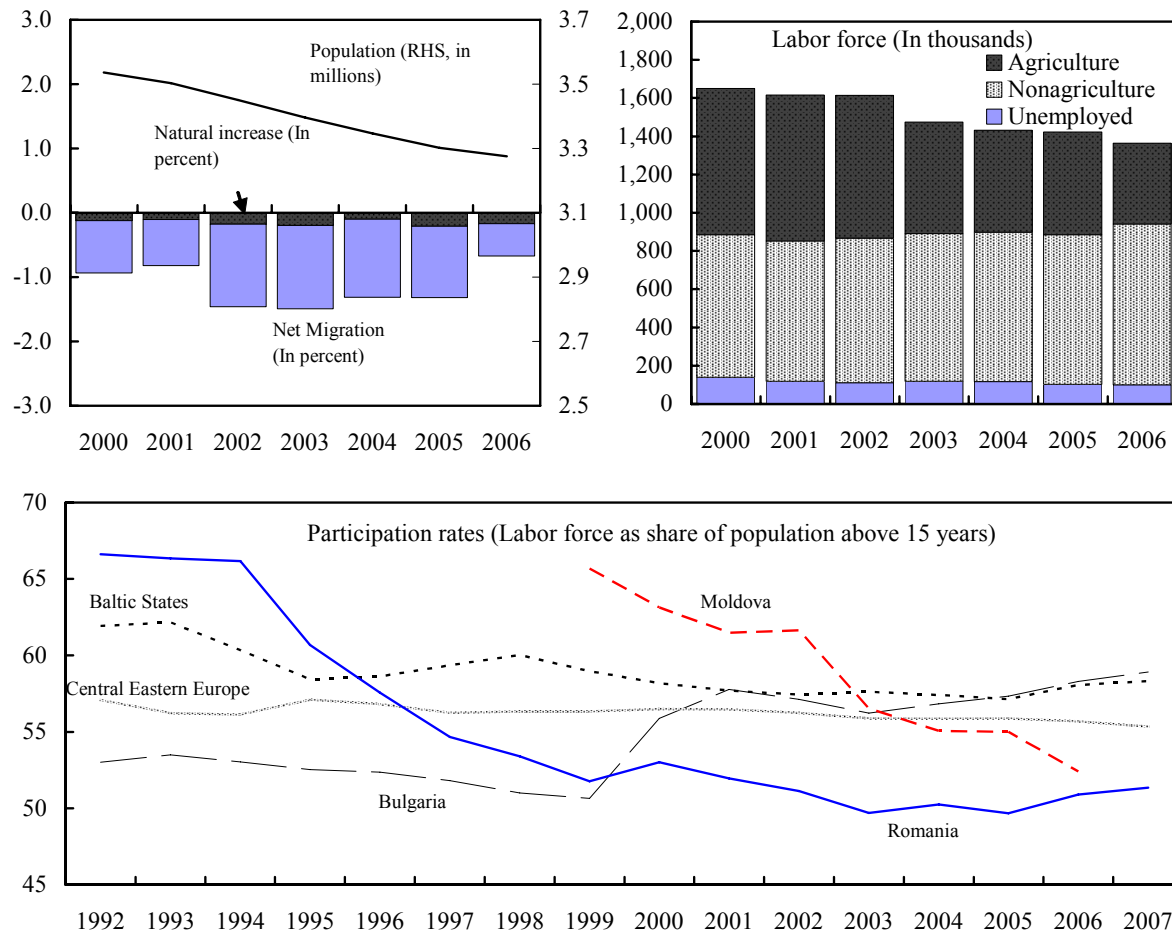


Sources: National Bureau of Statistics and Eurostat.

84.     **Developments in labor market closely mirror the transformation of the real economy** (Figure III.3). The allocation of labor resources was at the outset somewhat different from other countries in the region with a larger share of agricultural employment. Starting in 2002, the importance of agriculture fell sharply and reached Romania's level in 2007 (which is similar to Bulgaria's 2004 level). In contrast to other transition economies the transformation of the labor market, in particular some 350,000 jobs lost mostly in agriculture (one of quarter of the workforce in the year 2000) did not lead to persistently high unemployment levels. This is probably because job opportunities abroad—helped by linguistic and cultural links with larger, close neighboring economies—absorbed the temporary surplus of labor resources. As labor allocation across economic sectors is increasingly becoming similar to other countries in the region, the labor market may gradually begin to tighten. This may in turn put pressure on wages and further slow down emigration.

Figure III.3. Labor Market Developments
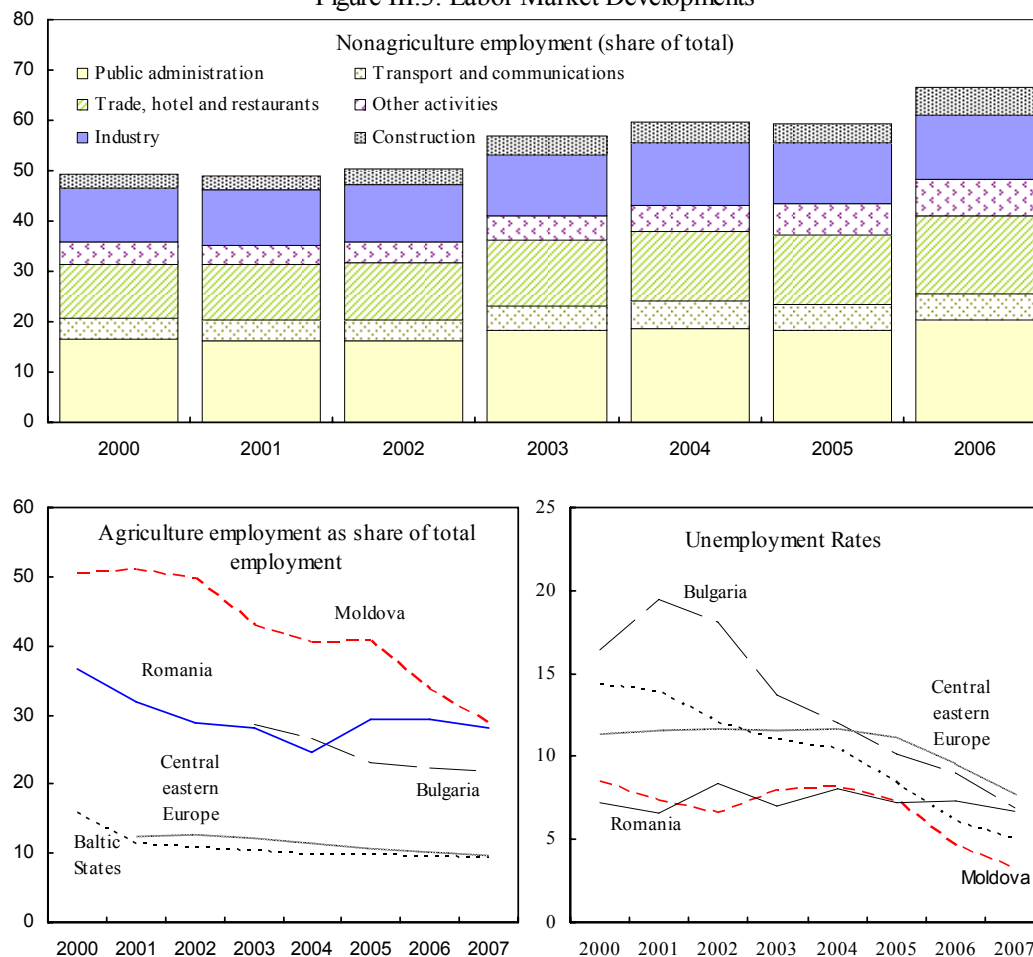


Sources: Eurostat and National Bureau of Statistics.

85.     **The labor market dynamics show a similar trend** (Table III.1). While the
agriculture sector has seen a stagnant job turnover with sharply falling employment levels,
the construction and service sectors have seen the opposite trends.  The job turnover in the
industrial sector has sharply increased, probably reflecting the replacement of traditional
industries (such as wine production, sugar, and tobacco) with newer industries.

Table III.1. Labor Market Dynamics

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Employment Growth | | | | | | | | Job Turnover[2] | | | |
| Overall | -1.1 | -1.2 | -0.5 | -0.6 | 0.9 | 0.1 | -0.7 | 23.1 | 20.3 | 20.6 | 24.8 | 25.9 | 25.2 | 25.9 |
| Agriculture | 0.6 | -1.3 | -1.2 | -2.0 | -0.4 | -1.8 | -2.7 | 13.8 | 11.2 | 8.2 | 9.5 | 11.3 | 10.3 | 8.8 |
| Public administration | -2.8 | -0.5 | 1.4 | -0.4 | 0.5 | 0.3 | 1.1 | 32.2 | 29.2 | 26.7 | 41.3 | 28.4 | 26.6 | 26.8 |
| Industry[1] | -0.6 | 0.5 | 1.1 | 1.8 | 2.0 | 1.5 | -2.0 | 39.0 | 35.0 | 44.9 | 53.7 | 60.8 | 57.5 | 62.3 |
| Construction | -6.4 | -3.4 | -1.9 | -0.4 | 2.4 | 3.1 | 3.9 | 31.4 | 32.2 | 34.6 | 28.7 | 29.1 | 38.1 | 56.1 |
| Services[1] | -3.0 | -2.1 | -1.1 | 1.2 | 2.5 | 1.9 | 1.0 | 28.1 | 25.4 | 29.7 | 28.7 | 30.2 | 29.1 | 30.8 |

Source: Labor Force Survey.

1. The 2006 employment growth was impacted by the Russian embargo on wine import from Moldova.

2. Defined as the gross number of hired and dismissed employees during the year as a proportion of total employment at the beginning of the year.

86.      **There have been substantial changes in several segments of the Moldovan population and labor market** (Table III.2). The biggest change is the decline in the labor force; whereas about a quarter of the job losses (in net terms) and reduced unemployed have been absorbed by other sectors of the economy, most of the remaining workers have sought employment outside the country. There has also been a substantial increase in the number of economically inactive (defined as working work less than 20 hours a week). For the youngest segment of the labor force (between 15-24 years), this is probably mostly linked to larger higher education enrollment, as both increased by about 69 thousand. For the segment above 65 years, about 41 thousand are no longer counted as employed, leaving some 35 thousand in this segment in the labor force. Despite the more than 187,000 new pensions granted during 2000-06 (Table III.3), the number of economically inactive in the 50-64 age group increased by only 40 thousand. This indicates an increase in economically inactive of more than 100 thousand people between 24 and 50 years; these might be supported by seasonal migration or through remittances indicating a higher reservation wage.

Table III.2. Moldova: Changes in Population and Employment, 2000-06
(In thousands)

| De jure population[40] | | | | | -54 | |
|---|---|---|---|---|---|---|
| De facto population[41] | | | | | -261 | Net emigration +207 |
| Above working age | | | | -53 | Under 15 -208 | |
| Labor force | | | -325 | Inactive | | |
| Employed | | -246 | Unemployed  -79 | Population       +271 | | |
| Agriculture | -344 | | | Students (15+) +69 | | |
| Industry | -8 | | | Retired 65 year  +41 | | |
| Construction | +27 | | | Other              +159 | | |
| Trade, hotel and restaurants | +31 | | | | | |
| Transport and communications | +3 | | | | | |
| Public administration | +22 | | | | | |
| Other activities | +23 | | | | | |

Source: National Bureau of Statistics.

87.      **Labor productivity has substantially increased** (Figure III.4). Not surprisingly, the largest (per worker) productivity gains have been in agriculture as output has increased and the employment level has fallen sharply. Similar to many other countries in the region, the real wages increases have in general been larger than the increases in productivity. However,

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[40] De jure population is a concept under which individuals are recorded (or are attributed) to a geographical area on the basis of the place of residence (source: OECD).

[41] De facto population is a concept under which individuals are recorded (or are attributed) to the geographical area where they were present at a specified time (source: OECD).

except for the industry and construction, the wage increases in Moldova have been remarkably similar in all sectors, perhaps a result of the wage setting mechanism (see below).

Figure III.4. Labor Productivity and Real Salaries, 2000-06
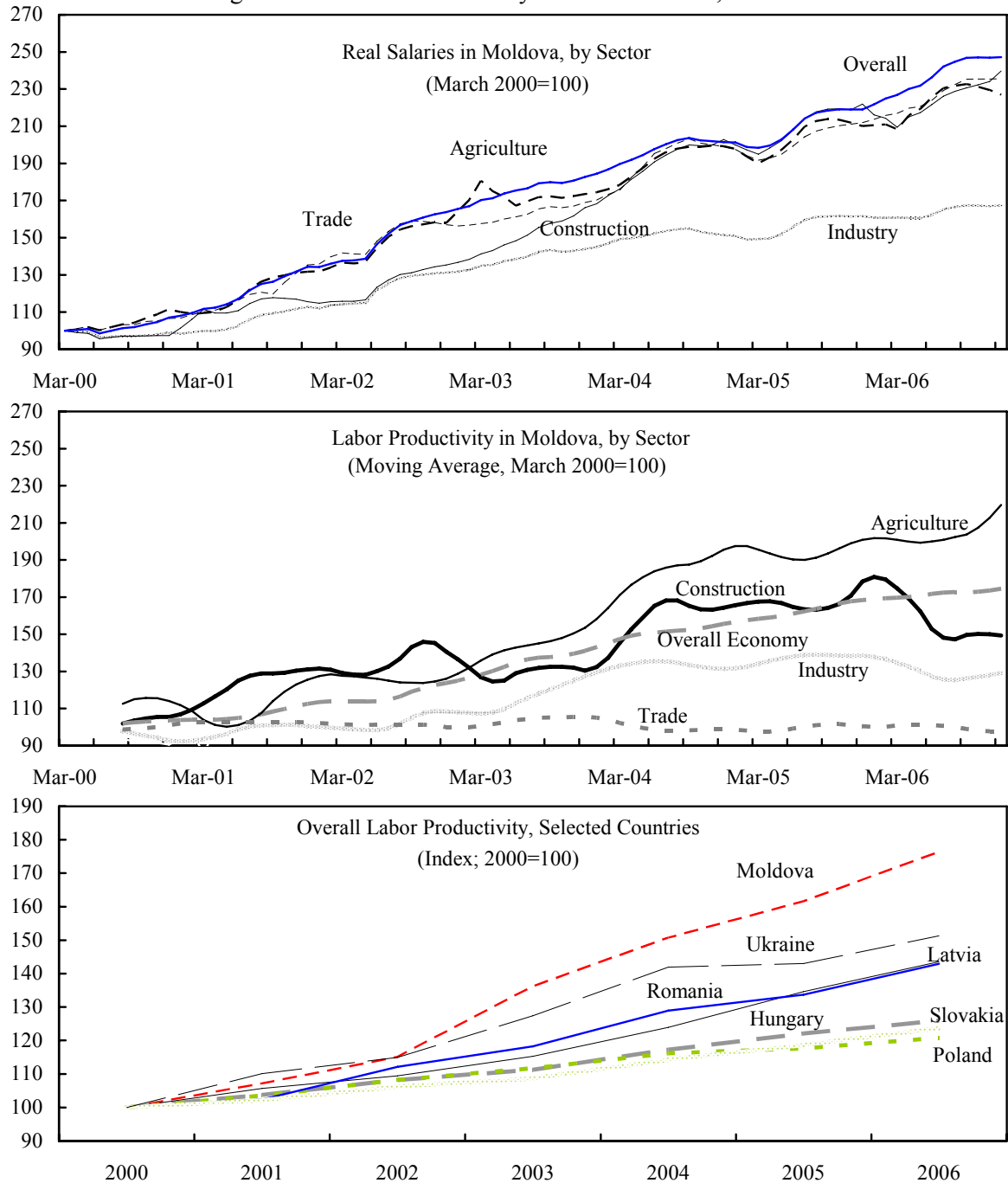


Source: World Economic Outlook and National Bureau of Statistics

88.     **The increased gap between wages in Moldova and those in neighboring countries despite the higher productivity gains is indeed a puzzle** (Figure III.5 and Annex 1). The reason might be that the "excess" of workers in traditional sectors such as industry and

agriculture have moved into other sectors of the economy, thereby depressing wage growth. This however, might be shifting as there is anecdotal evidence of labor shortages in certain sectors and sporadic attempts to attract Moldovans working aboard. However, while some sectoral labor shortage may occur as new industries develop (such as the ongoing expansion in call-centers), any tightening of the labor market will most likely be gradual; the recent increase in working age economically inactive as well as that agriculture still accounts for a substantial percentage of those employed indicate a sufficient short- to medium-term supply of labor. However, whether these represent a readily available pool of workers for more modern sectors of the economy is still unclear.

Figure III.5. Difference between Monthly Moldovan and Average Regional Wages, by Sector
(In US dollars; Region = Bulgaria, Romania, Russia, and
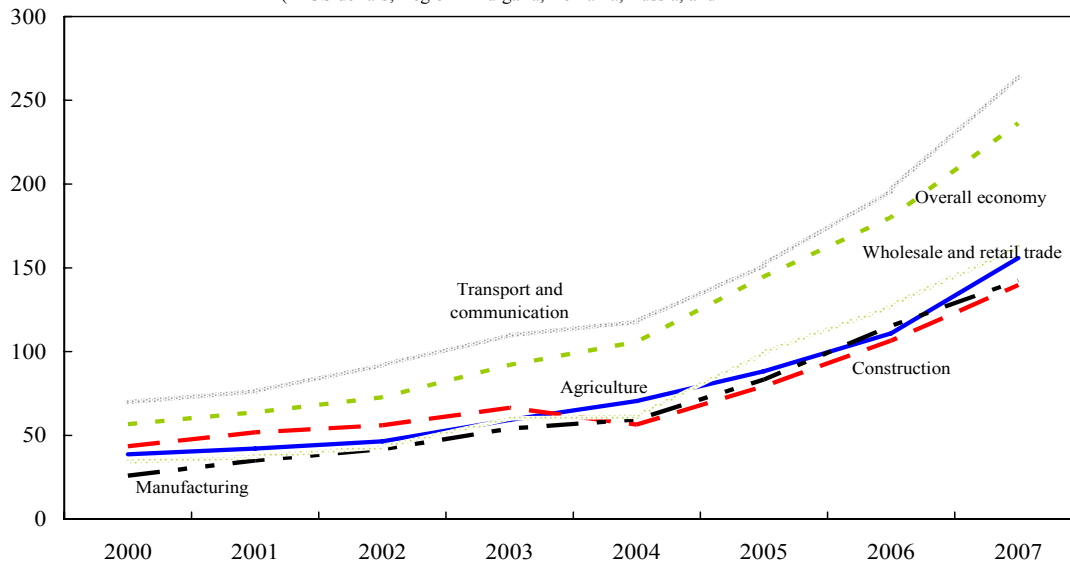


Sources: National statistical agencies.

89.     **The recent emigration of workers does not appear to have substantially impacted growth prospects** (Figure III.6). Emigrants are primarily men with secondary education from rural areas, representing around 20 percent of that segment of the 2004 population. The depletion of human capital appears to be relatively modest partly because university educated people overwhelmingly seek domestic employment. As only about one third of the emigrants tend to remain abroad, a large portion of the population has international work experience, some of which could potentially increase productivity of the domestic workforce.[42] The outlook is less clear, as the increasing gap between salaries in Moldova and neighboring countries can increase emigration and seriously undermine future growth. On the other hand, the wage gap has increased competitiveness and probably

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[42] Surveys indicate that less than 40 percent of the emigrant population has been abroad for more than one year.

explains part of the recent surge in investments in export-related industries and in foreign direct investments.

Figure III.6. Moldova: Share of 2004 Population Abroad in 2006, by Demographic Category
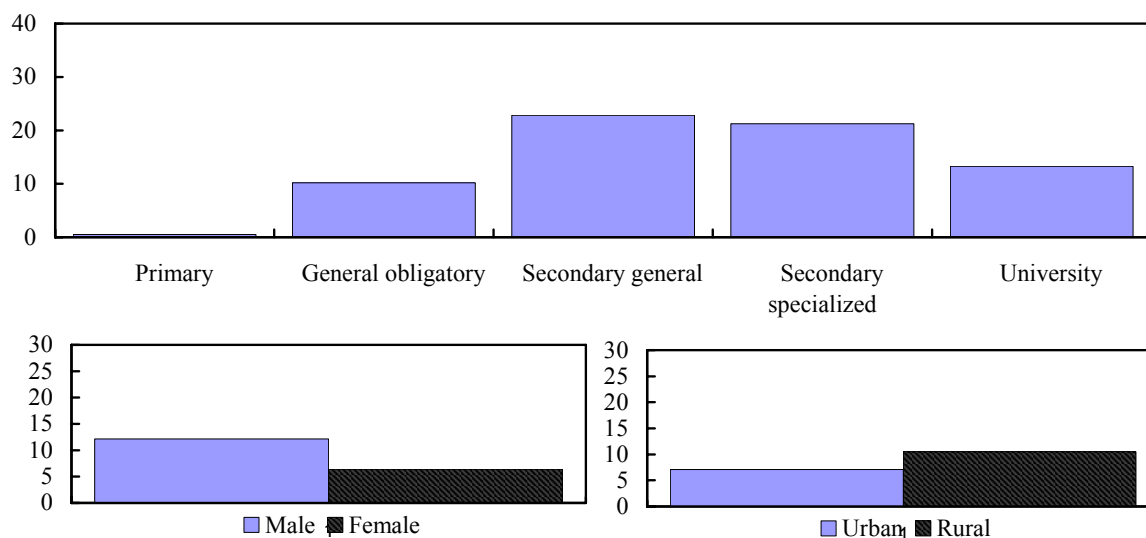


Source: Labor Force Survey.

## C. Institutional Framework of the Labor Market

90.      **Many institutional factors of the labor market impact worker incentives**. In transition economies in particular, these supply-side factors can impact the level of informal employment, the size of the shadow economy, migration, as well as the competitiveness of the overall economy. The factors that appear to be most relevant to Moldova are discussed below.

**The wage setting process**

91.      **The private sector wage setting process[43] in Moldova appears to be largely decoupled from economy, sector- or firm-level productivity.** The process takes place in a tripartite framework in which the government plays a decisive role through a traditional system of general wage indexation based on the statutory minimum wage.[44] Although this so-called "tariff schedule system" has been formally abolished, it reportedly remains more common than bilateral firm- or sector-negotiated agreements, at least in traditional industries

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[43] In the public sector, wages are directly set by government decree after tripartite consultations process.

[44] Although it is unlikely that many workers actually receive the minimum wage (about 80 dollars—about a half of the official subsistence minimum) only, it serves as a reference point for indexing salaries tiers based on type and difficulty of work.

and sectors. The collective agreements between the social partners on the national, regional, branch and enterprise levels that do take place typically focus on separate wage adjustments to the indexing system. This may explain why the wage increases in Moldova have been remarkably similar in all sectors, despite the varying productivity gains. The predominance of the tariff schedule system, which appears to be similar to the "wage tariff system" in the Slovak republic (IMF, 2006) might be reduced in the future through legislative[45] and other changes (such as that newer industries and firms seem to be increasingly using a more decentralized wage setting mechanism).

**The tax wedge**

92.      **The tax wedge[46] in Moldova was 32 percent in 2006, relatively low by regional standards** (Figure III.7). This could indicate that the potential financial disincentive effects on labor effort are relatively modest in Moldova. Moreover, the tax wedge is estimated to have fallen further to below 31 percent in 2007, and will probably remain unchanged in 2008 as the lowered tax rates are offset by modestly higher contributions (IMF, 2007).

Figure III.7. Tax Wedge in Selected Countries[47]
(Percent of Gross Wages, 2006)
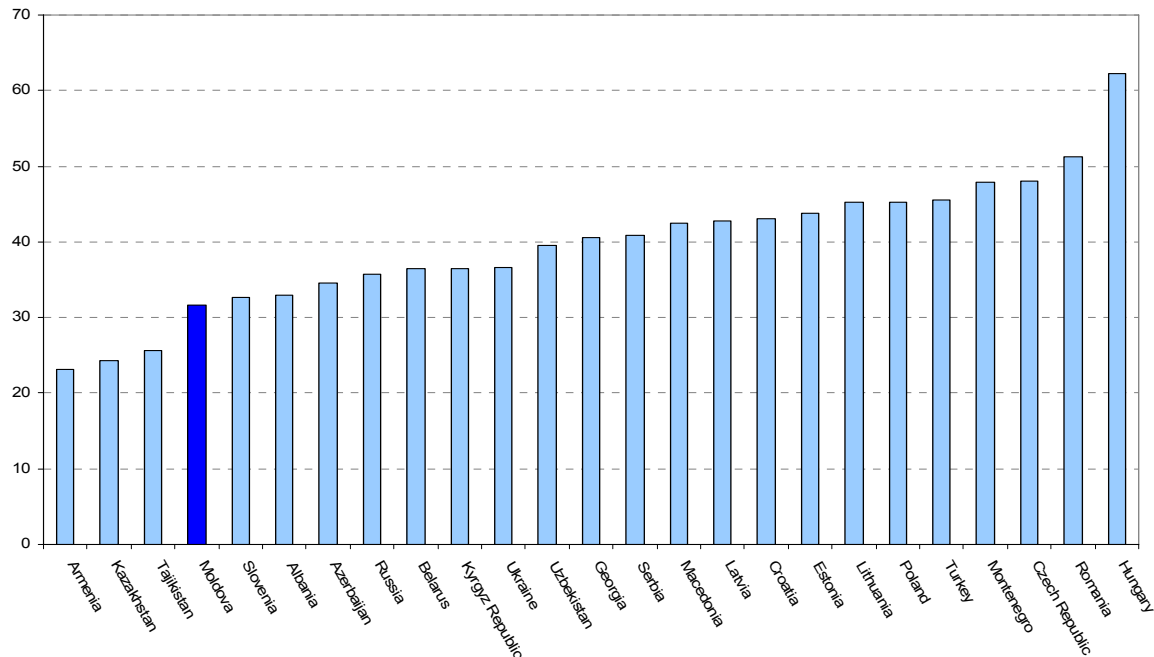


Source: World Bank (2007).

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[45] While the legal framework for a collective bargaining system has been put in place, it is not yet operational.

[46] Tax wedge is here defined as the sum of personal income tax and all social contributions over the total labor cost.

[47] Data refer to effective rates on average wage.

93.     **Personal income taxes play a less important role than contributions in determining the wedge.** Three-fourths of the wedge is explained by social security contributions. The second biggest factor is the health fund contributions, which explain 13 percent of the wedge. Personal income tax is the third factor and explains the remaining 12 percent of the wedge (IMF, 2007). However, the role of contributions might be overstated as enforcement is generally considered to be weak. The reason might be that according to current legislation, employees are entitled to benefits irrespective of actual employer contribution levels.

94.     **Moldovan personal income tax rates[48] are also relatively low compared to other countries in the region.** The best comparison is probably the effective tax rate (personal income tax over the average yearly wages) which is quite low in Moldova (Figure III.8). Comparing the top marginal rates might not be very useful since countries differ (for example, different level of deductions and income distribution of taxpayers), but indicates that the Moldovan 20 percent rate (reduced to 18 percent in 2008) is relatively low (e.g., Poland has 40 percent, Hungary 36 percent, Slovenia 41 percent), although it is obviously higher than in flat-rate countries like Russia (13 percent), Romania (16 percent), Macedonia and Serbia (12 percent).

Figure III.8. Personal Income Tax Rate (effective), 2006
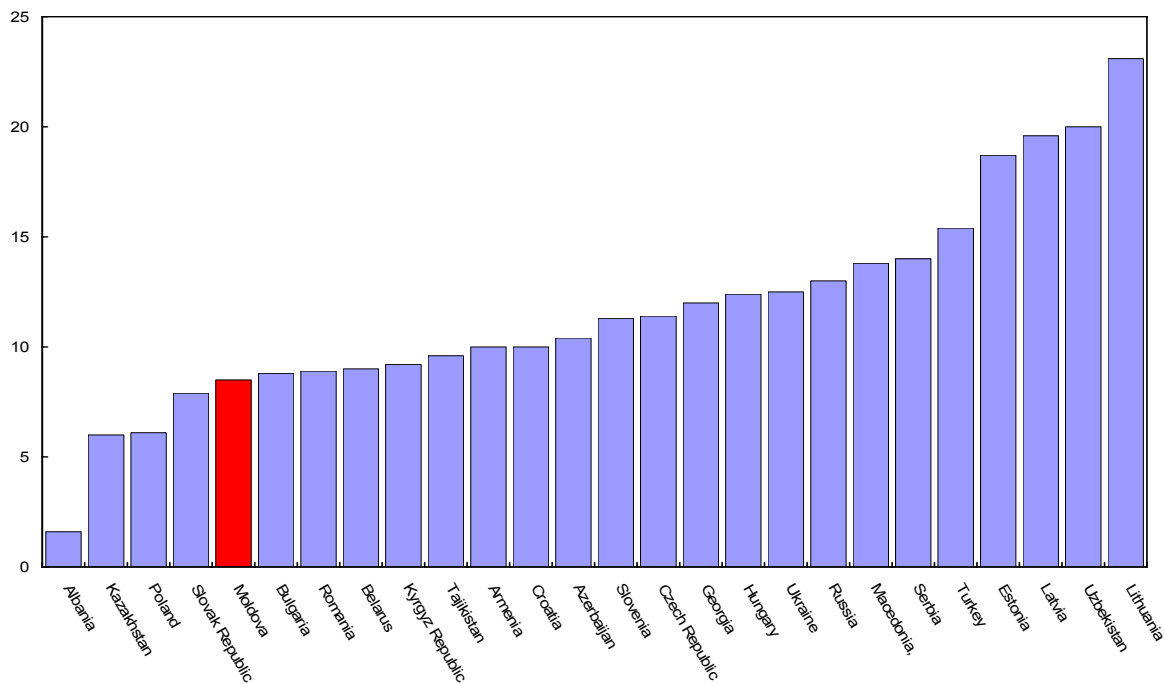


Source: World Bank (2007).

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[48] Until 2008, the personal income tax had a progressive rate structure with 3 brackets (7, 10 and 20 percent). In 2008, the structure was changed to a two-tier system of 7 and 18 percent.

**Social benefits**

95.     **Social benefits do not appear to be a deterrent to employment in Moldova.** The main reason for the low level of unemployment benefit recipients might be the social security contribution requirement, disqualifying about one third of the labor force that are informally employed (ILO, 2005). Even for those that do qualify, the level of unemployment benefit is quite low, despite the legal obligation that the minimum level of the unemployment benefits should be equivalent to 50 percent of the national average wage. In addition, there is not yet any functioning targeted social assistance system in place and active labor policies seem to play a very minor role in Moldova (Table III.3). As a consequence, any notion of "unemployment trap" or "low income trap" do not seem to be particularly relevant (IMF, 2006); instead the low level of social benefits could help explain the relatively low level of unemployment and part of the emigration in Moldova.

96.     **The recent sharp increase in new pensions does not appear to have substantially reduced the incentives to work.** Unlike in other transition countries, the use of pensions to mitigate the effects of economic restructuring was not as widespread during the 1990s in Moldova as in other transition economies (Fortuny, Nesporova and Popova. 2003). As noted above, despite that the number of new pensions granted every year have almost tripled since 1999, it has had very little impact on the number of economically inactive among the population receiving the pensions. The reason might be that pension benefits are still so low that unless coupled with other sources of income, pensioners in general fall below the poverty line.[49] This implies that a substantial increase in pensions might abruptly tighten the labor market.

Table III.3. Social Benefits, 1999-2006

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|
| | | | Recipients of unemployment benefit | | | | | |
| As percent of labor force | 1.5 | 1.4 | 1.0 | 0.8 | 0.5 | 0.2 | 0.2 | 0.3 |
| As percent of total unemployed | 16.5 | 16.9 | 13.6 | 11.9 | 6.5 | 2.8 | 2.9 | 7.0 |
| As percent of registered unemployed | 43.8 | 46.7 | 27.0 | 19.9 | 12.2 | 5.5 | 5.0 | 8.2 |
| | | | | | | | | |
| Memo: | | | | | | | | |
| Unemployment benefit (percent of average wage) | 33.3 | 29.4 | 25.8 | 19.1 | 23.0 | 38.9 | 38.8 | 27.9 |
| Unemployment expenditures (percent of GDP) | … | 0.14 | 0.10 | 0.09 | 0.08 | 0.07 | 0.07 | 0.10 |
| Active labor policies (percent of GDP) | … | 0.05 | 0.03 | 0.02 | 0.03 | 0.03 | 0.03 | 0.04 |
| Total pensioners | 682,217 | 668,127 | 648,157 | 622,007 | 616,632 | 608,776 | 618,200 | 620,000 |
| *of which:* new pensions | … | 15,284 | 14,103 | 17,099 | 28,543 | 34,295 | 38,802 | 39,313 |
| Average monthly pensions (lei) | 89 | 94 | 135 | 166 | 215 | 335 | 338 | 443 |

Sources: Ministry of Economy and Trade of the Republic of Moldova and National Agency for Employment.

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[49] The World Bank estimated that 87 percent of those received pension income in 2002 fell below the poverty line (World Bank, 2004).

**Employment protection legislation**

97.     **Moldova's employment protection legislation remains significantly more rigid than the OECD average.** Although a new Labor code was adopted in 2003, certain provisions such as redundancy obligations (substantially larger severance pay obligations for employees with long seniority[50] and third party notification) drag down the score on rankings such as the World Bank's "Doing Business" survey (Table III.4). However, the high rate of job destruction suggest the that these obligations are not binding constraints for the labor market (Ristowski, 2004).

Table III.4. Employing Workers Indicators, 2008

| Region or Economy | Difficulty of Hiring Index | Rigidity of Hours Index | Difficulty of Firing Index | Rigidity of Employment Index[1] | Nonwage labor cost (% of salary) | Firing costs (weeks of wages) |
|---|---|---|---|---|---|---|
| CIS | 25.0 | 45.5 | 30.9 | 33.9 | 25.6 | 18.0 |
| OECD | 25.2 | 39.2 | 27.9 | 30.8 | 20.7 | 25.7 |
| Central eastern Europe | 27.8 | 60.0 | 30.0 | 39.4 | 28.8 | 24.6 |
| Moldova | 33 | 40 | 40 | 38 | 28 | 37 |

Source: World Bank Doing Business project, 2008.

1. The Rigidity of Employment Index is the average of three sub-indices: Difficulty of Hiring Index, Rigidity of Hours Index, and Difficulty of Firing Index. Each of these indices assigns values between 0 and 100, with higher values representing more rigid regulations.

## D.    Flexibility in the Labor Market—Empirical Analysis of Determinants of Real Wages

98.     **This paper uses an econometric analysis to assess the degree to which the labor market has been able to adjust to recent changes in the economic situation.** To formally test the degree of flexibility of real wages, we use the Zovas and Melihovs (2005) approach, which specifies that real wages are determined by changes in productivity and unemployment. However, to fully assess the level to which Moldova's wages have performed as a shock absorbing mechanism, we have included minimum wages (given the indexation of wages) and emigration as only about one third of the recent shock has been absorbed by the domestic economy, the rest (in net terms) have sought employment outside the country. The factors included in the analysis are briefly described below:

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[50] The Moldovan average is 28.7 weeks pay for workers with 20 years of employment.

- **Minimum wages.** The impact of minimum salaries on real wage wages—and indeed unemployment—depends on whether it is set at market clearing levels. In Moldova, minimum salaries are currently set at 900 lei/month for the general economy (at about one third of average monthly salaries)[51] and it is doubtful that many receive this salary only. However, as discussed above the main impact of minimum salaries on real wages may be indirect through the "tariff-schedule system". If this is applied widely, minimum wages are expected to have a positive impact on real salaries, possibly distorting the relationship between productivity and real salaries.

- **Productivity**. According to the marginal productivity theory of wages, the highest wage an employer is willing to pay an employee is equal to the additional value that one extra worker generates. Consequently, with labor productivity increasing in the economy, a real wage increase can be anticipated. This theory deals wage setting mechanism only from the demand side in that wages are determined by the amount an employer is willing to pay. In Moldova, the wage setting mechanism might distort the relationship between real wages and productivity.

- **Emigration** of workers reduces the labor supply in the economy or at least in the sectors that are affected. Hence, workers that stay behind stand to gain in terms of real wage increases unless there are offsetting factors in the economy. As noted above, Moldova has experienced substantial emigration, especially as agriculture employment has declined, and to the extent this has reduced labor supply it can be expected to be positively correlated with real salaries in the economy.

- **Unemployment** can be viewed as an indicator of equilibrium in the labor market. When unemployment falls, it might indicate an increase in demand for labor and hence employers view marginal product of labor to have increased which in turn can have an impact on real wages. Given that the unemployment level in Moldova has remained below the regional average throughout the recent changes in the economy and the labor market, it is doubtful that the unemployment rate has been a decisive factor in the wage setting process in Moldova.

**Econometric results**

99.     **The long-run and short-term results below are from a vector error correction model, using a monthly dataset from 2000-2006.** All variables used in this analysis were tested for seasonality, and those that were found to be seasonal were adjusted using the X-12 ARIMA methodology. Using the augmented Dickey-Fuller (ADF) test, all variables were

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[51] For the agriculture sector, the minimum salaries are set at 700 lei per month, also about one third of average salaries in the sector.

found to be stationary in first differences, and all equations had at least one cointegrating vector. Most variables were unaffected by the change in methodology (and those that were, have been adjusted using the trend in the old data series), hence a dummy variable was deemed, and indeed found to be, unnecessary.

### *Determinants of long run real wages*

100.　　　The following equations were obtained describing the long-term wage setting mechanism in the overall economy and some specific sectors:

| | | | | | |
|---|---|---|---|---|---|
| Economy<br>*t-statistic*<br>*R2 = 0.56* | $RW_t = -5.80$ | $+0.48(RMINWG_t)$<br>(7.82) | $+0.88(RPROD_t)$<br>(3.49) | $+0.02(EMIGR_t)$<br>(0.20) | $-0.11(UNMP_t)$<br>(-2.85)　$+\varepsilon_t$ |
| Industry<br>*t-statistic*<br>*R2 = 0.71* | $RW_t = 0.22$ | $+0.25(RMINWG_t)$<br>(5.77) | $+0.03(RPROD_t)$<br>(0.31) | $+0.24(EMIGR_t)$<br>(4.53) | $-0.03(UEMP_t)$<br>(-0.97)　$+\varepsilon_t$ |
| Construction<br>*t-statistic*<br>*R2 = 0.58* | $RW_t = -5.52$ | $-0.29(RMINWG_t)$<br>(-4.51) | $+0.75(RPROD_t)$<br>(6.88) | $+0.54(EMIGR_t)$<br>(6.23) | $+0.13(UEMP_t)$<br>(3.36)　$+\varepsilon_t$ |
| Trade<br>*t-statistic*<br>*R2 = 0.32* | $RW_t = 8.97$ | $+0.48(RMINWG_t)$<br>(4.45) | $-1.49(RPROD_t)$<br>(-3.66) | $+0.38(EMIGR_t)$<br>(3.19) | $-0.20(UEMP_t)$<br>(-2.84)　$+\varepsilon_t$ |
| Agriculture<br>*t-statistic*<br>*R2 = 0.18* | $RW_t = -3.28$ | $+0.23(RMINWG_t)$<br>(3.44) | $+0.16(RPROD_t)$<br>(0.89) | $+0.53 (EMIGR_t)$<br>(7.08) | $-0.03(UEMP_t)$<br>(0.41)　$+\varepsilon_t$ |

where all variables are in logs and RW is real monthly wages, RMINWG is the sectoral minimum wage deflated by CPI, RPROD is real increases in value added, EMIGR is the total stock of emigrants, and UEMP is the deviation of unemployment from its long-run trend.

101.　　　**The results seem to broadly confirm that the specified factors help determine as expected long run real wages in the economy as whole.** The estimated coefficients show that a 1 percent increase in real minimum wages tend to increase real wages by 0.5 percent, a 1 percent increase in productivity leads to a 0.9 percent increase, and finally that a 1 percent increase (decrease) in unemployment from it's long-run trend decreases (increases) real wages by 0.1 percent. A possible interpretation of these results might be that despite widespread indexation of wages, there has overall been a close correlation between productivity and real wages. While unemployment has only played a very minor role in determining long run real wages during the labor reallocation period, emigration has had no impact as it has mainly (in net terms) been a channel for "surplus" labor from the traditional sectors.

102.　　　**The sector-specific results show a somewhat different story.** The effect of minimum wages for most sectors assessed (which represent just a part of the economy) are

similar to those for the economy as a whole, except for construction for which it is negative and significant. The reason for this might be that wage indexation in this sector is not wide-spread; the impact of minimum wages in other parts of the economy induces layoffs and thus an increase in labor supply for the construction sector (thus putting pressure on real wages). In terms of increases in productivity, only the construction sector appears to be passing on gains in the form of real wages increases; the link in the trade sector appears to be negative perhaps indicating that the large recent increases in output have been caused by more workers (which are mainly informally employed in this sector) at the cost of lower real salaries. Emigration for all sectors assessed show as expected a positive correlation, as the reduced labor supply have put pressures on real wages. Unemployment is only significant for trade and construction; for the latter, higher unemployment seem to be positively correlated with real salary increases perhaps indicating that people tend to register as unemployed instead of migrating when the real wages in the construction sector—which has indeed been the sector creating most new jobs—go up.

**Short-term labor flexibility**

103.      **For labor market flexibility analysis, short-term wage fluctuations and adjustments to the long-term trend may be more important than the long-term developments.** The results are as follows (only statistically significant results are reported):

| | | | | |
|---|---|---|---|---|
| Economy | $\Delta(RW_t) =$ | $+0.66(RW(-1))$ | $+0.09(EMIGR_t)$ | $-0.03\,\varepsilon_t$ | $+\varepsilon_t$ |
| *t-statistic* | | (8.07) | (2.26) | (-2.08) | |
| | | | | | |
| Industry | $\Delta(RW_t) =$ | $+0.69(RW(-1))$ | $+0.09(EMIGR_t)$ | $-0.05\,\varepsilon_t$ | $+\varepsilon_t$ |
| *t-statistic* | | (9.43) | (3.39) | (-2.90) | |
| | | | | | |
| Construction | $\Delta(RW_t) =$ 0.01 | $+0.71(RW(-1))$ | $-0.22\,\varepsilon_t$ | $+\varepsilon_t$ | |
| *t-statistic* | (2.10) | (9.03) | (-5.59) | | |
| Trade | $\Delta(RW_t) =$ 0.01 | $+0.33(RW(-1))$ | $-0.06\,\varepsilon_t$ | $+\varepsilon_t$ | |
| *t-statistic* | (2.98) | (3.2) | (-3.37) | | |
| | | | | | |
| Agriculture | $\Delta(RW_t) =$ 0.01 | $+0.36(RW(-1))$ | $-0.16\,\varepsilon_t$ | $+\varepsilon_t$ | |
| *t-statistic* | (2.65) | (3.2) | (-2.09) | | |

104.      **The results indicate that emigration has been the short term "shock absorber" for the economy during the labor reallocation.** The estimated coefficients show that, in the short term for the economy as a whole and in the industrial sector, emigration explains some 9 percent of the variation in real wages. Emigration is not found to be significant in the short term for other sectors, which might indicate that the labor reallocation process has provided sufficient labor supply in these sectors and that supply rigidities such as required skills are not binding in these sectors.

## E. Summary and Policy Implications

105. **The overall labor reallocation process seems to be coming to an end as the Moldovan economic and labor market structure increasingly mirrors other transition countries.** While the process has increased supply of labor in some sectors of the economy and thus helped to contain wage growth, it has also led to substantial emigration and in turn higher productivity. In the future, a gradual tightening of the labor market can be expected, which might put increasing pressure real wages. This increases the necessity to ensure flexibility in the labor market to ensure a close link between real wage and productivity growth. Hence, possible policy implications might be:

- **Reform the wage setting mechanism.** In the future, it may no longer be possible to rely on a shift of employment from the agriculture sector to other sectors to contain wage growth. Instead, efforts might be needed to ensure that the wage setting mechanism reflect industry and firm-specific productivity differences. Differentiated wage gains might in turn help close some of the sectoral wages gaps with neighboring countries, and thus further stem emigration.

- **Consider reforms that might impact labor supply.** The overall labor supply seems sufficient to facilitate the ongoing labor transformation process, although pension reform might speed up the tightening of the labor market. Efforts should therefore probably focus on mitigating any emerging sectoral labor shortages that might occur, possibly by attracting non-resident workers and ensuring cross-sectoral labor flexibility.

Annex III.1. Monthly wages, Selected Countries 2000-06

(In US dollars)
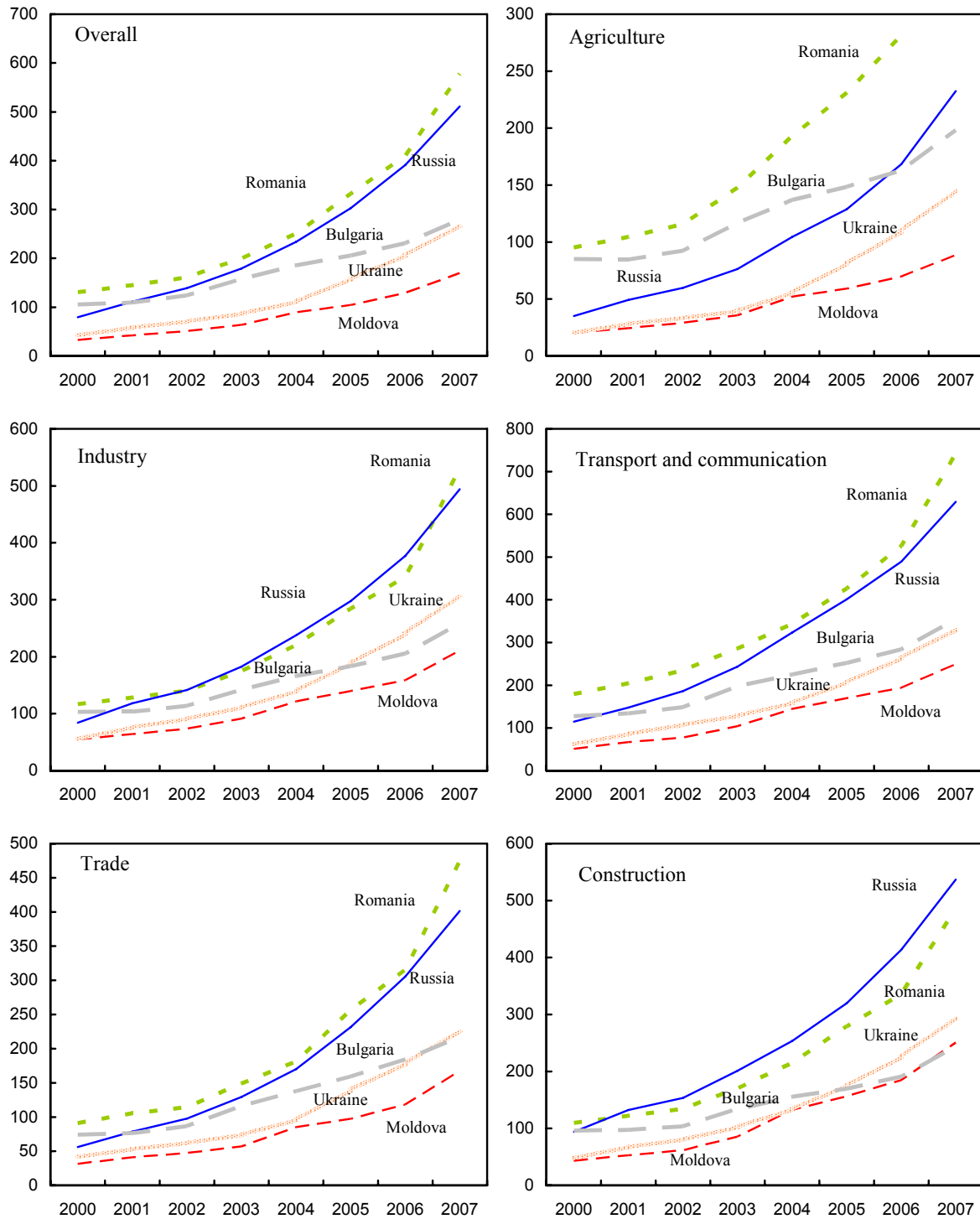


Sources: National statistical agencies.

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# IV. GLOBALIZATION AND MOLDOVA'S WINE INDUSTRY[52]

106. **Wine has traditionally been an important export for Moldova.** The temperate climate is ideal for grapes, and as much as 10 percent of the arable land has been planted with vineyards over the years. During Soviet times, Moldovan wine was widely consumed throughout the USSR, with a strong brand identity. After independence, however, exports to other destinations have not grown substantially.

107. **This paper examines the experiences of wine-exporting countries and contrasts them with prospects for Moldovan wine exports.** After a brief review of global trade in wine over the past few decades, three groups of countries are contrasted. The first group includes four new big exporters: Argentina, Australia, Chile, and New Zealand. These countries have very quickly expanded both production and exports, with sustained growth rates of roughly 30 percent for over fifteen years, while improving quality at the same time. The second group includes Eastern European countries: Bulgaria, Hungary, Moldova, and Romania. Growth has been stagnant, or negative in this group, due to the challenges of restructuring industries after the end of collective agriculture. The third group offers a cautionary tale, and includes Northern African countries: Algeria, Morocco, and Tunisia.

108. **Wine production and exports would benefit from reforms to improve the business environment.** Wine shares many characteristics of manufactured goods, and productivity in the sector is dependent on investments, not just agricultural factors. The four big new exporters expanded export destinations, increased volumes, and raised quality simultaneously, implying a high level of innovation within their industries. Access to foreign direct investment and the corresponding technology transfer could quickly allow the sector to be more competitive.

109. **In March 2006, Russia imposed a ban on imports of Moldovan wine.** As wine exports were more than 10 percent of GDP, and 80 percent of all wine went to Russia, this was a severe balance of payments shock. Wine exports to Russia have resumed as of October 2007, but recovery is likely to be gradual. The original dispute was over the sanitary certification of wine, and administrative procedures by the Russian authorities are now more stringent.

## A. Global Wine Production and Exports

110. **Both wine production techniques and export patterns have changed significantly over the last thirty years.** Advances in technology allow for more control over the production process, and thus over the finished product. This has allowed the quality and consistency of even cheap wine to be improved, making competition more difficult, but also

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expanding the market. The new techniques have been adopted with great success by several countries, with large increases in exports.

**Wine Production**

111.     **There is a taste for variety by wine consumers.** Although it is an agricultural product, it is perhaps more appropriate to compare it with manufactured goods. Some measures of quality are available and widely accepted, such as reviews by recognized wine critics,[53] but there are strong branding components. The taste for variety appears to have driven much of the growth in world wine trade over the past twenty years.

112.     **One of the most important determinants of wine quality is grape quality, implying high labor costs.** Although some industrial countries (such as Australia) are moving to mechanical picking of grapes, higher quality vineyards rely on hand-picking.[54] This can greatly increase the labor cost, which can be a significant fraction of operating costs.[55] As Moldova has generally low labor costs and a large number of workers with experience in picking grapes (many families maintain vineyards for personal use), this could be a significant competitive advantage. While this could imply that large-scale, integrated vineyards and wineries are needed, some countries, notably Germany, still rely on co-operatives to produce grapes (Hanf and Schweikert, 2007).

113.     **However, technological advances in winemaking also necessitate capital investments**. Modern winemaking techniques rely heavily on laboratory testing to assess the characteristics and of pressed grapes, and make decisions about blending batches for consistency. This also requires a controlled fermentation environment, and the associated equipment. Although Moldova has the

| Table IV.1. Competitiveness Indicators | | |
|---|---|---|
| Country | Manufacturing Wages (US$) | Doing Business Rank |
| Argentina | 3.17 | 109 |
| Australia | 19.11 | 9 |
| Chile | 2.84 | 33 |
| New Zealand | 12.72 | 2 |
| Bulgaria | 1.34 | 46 |
| Hungary | 5.20 | 45 |
| Moldova | 0.91 | 92 |
| Romania | 2.01 | 48 |
| Sources: International Labor Organization, World Bank | | |

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[53] For example, Robert Parker.

[54] Indeed, , trockenbeerenauslese (a German dessert wine) requires that grapes be individually picked to qualify for that label.

[55] A 1992 study of costs for Sonoma County, CA vineyards calculated labor costs to be roughly half of operating costs.

lowest wages (using manufacturing wages as a proxy for wages in general), this is not enough—the World Bank cost of doing business indicators rank it almost as poorly as Argentina, and well below other Eastern European countries.

114. **Skilled oenologists are needed to apply these techniques, although turnaround times can be quite short**. There are now degree-granting programs in a number of the new wine regions, such as Australia and California, that train vintners in these more industrial techniques. Due to the difference in seasons between the Southern and Northern Hemispheres, some vintners have begun to consult for multiple wineries in one year. This allows for faster technological diffusion, and can quickly raise the quality of wine produced (Giuliani, 2007). Liberal visa policies for these "flying winemakers" would be an important complement to investment incentives.

115. **With the rise in labeling by wine varietal, it has become easier to introduce new wines.** Wines and spirits from are accorded special protection under the World Trade Organization, and products associated with geographic regions are only allowed to be labeled as such if they are made in those regions. For example, champagne can only be made in the Champagne region in France, and sherry can only be made in Jerez in Spain.[56] To get around this, California producers began to label wine according to the primary grape varietal, such as Cabernet Sauvignon. This allowed for comparisons before tasting, making it easier to try a familiar grape from a new place. However, as consumers become accustomed to these labels, it has also been easier to introduce new varietals, such as Argentina's Malbec.
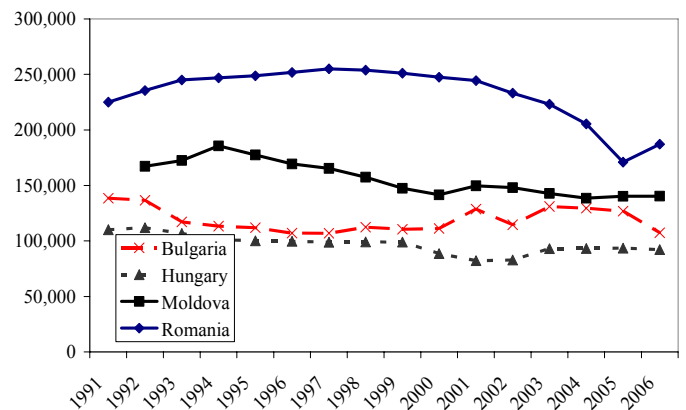
116. **Hectares of grapes planted gives some indication of the possible scope for wine production in a country.** Both the big new wine exporters and the Eastern European

Figure IV.1. Hectares of Grapes Planted
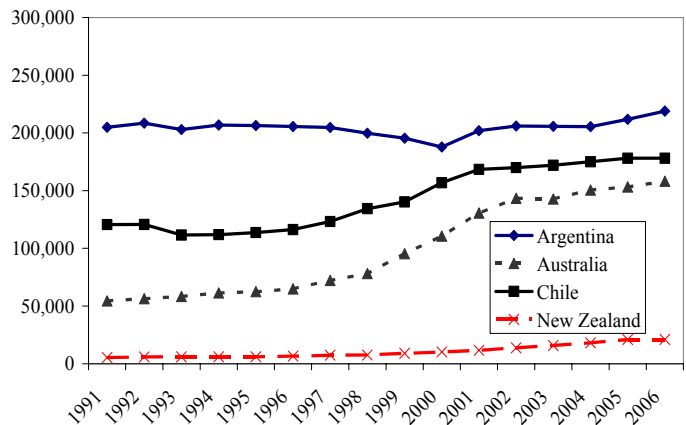


Source: Food and Agriculture Organization

Figure IV.2. Hectares of Grapes Planted



Source: Food and Agriculture Organization

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[56] Article 23 of the Trade-Related aspects of Intellectual Property Rights (TRIPS) agreement.

countries have similar areas planted. While this does not directly translate into production levels, it is a rough indication of how far the industry could expand. However, the quality of plantings can vary a great deal. Incentives to only increase hectares planted could, in fact, be counterproductive without the appropriate incentives for quality. Finally, plantings do not always translate into harvested grapes.

117.    **Grape yields per hectare give some indication of vineyard productivity, although there are important caveats**. These caveats include intensity of cultivation, grape variety, climate, and whether green harvesting is practiced (whereby excess bunches are harvested early to raise quality of the remaining grapes). Yields in the big new wine producers tend to be higher than in Eastern European countries. Although many of the Eastern European countries have older, less productive vineyards, they also have vineyards that are not actively managed or harvested, lowering the estimated yield (calculated from the grape harvest and hectares planted). On the other hand, yield is also

Figure IV.3. Pounds of Grapes per Hectare
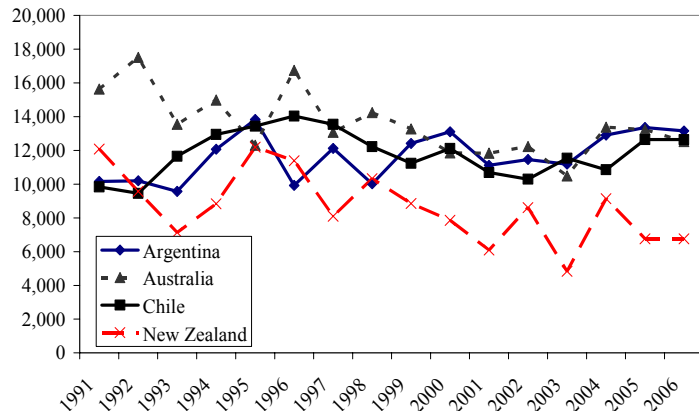


Source: Food and Agriculture Organization

Figure IV.4. Pounds of Grapes per Hectare



Source: Food and Agriculture Organization

an indicator that should be targeted with caution. For example, New Zealand has lower yields than Argentina, Australia, or Chile, which reflects both vineyard management choices and grape variety. If the objective is to maximize profits, incentives to quality trump volume targets.
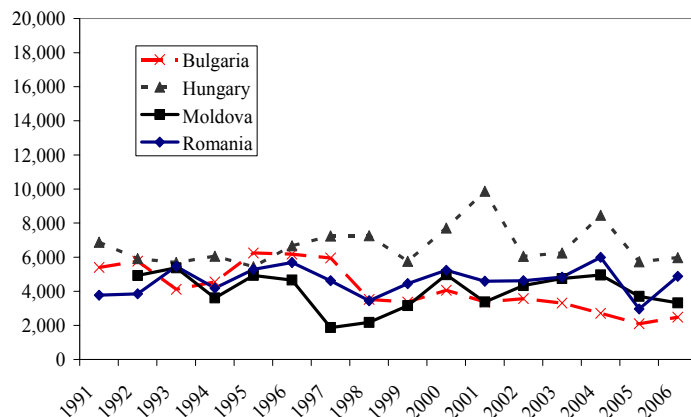
**Wine Exports**

118.    **World wine exports expanded by a factor of 150 from 1976 to 2006,** with most of the exports coming from a few producers. The chart below shows total exports and those of the top five exporters, in billions of US$. Note that smaller producers have been gaining

market share, with the share of the top five falling to 75 percent in 2006. However, the share of the top ten exporters was still 90 percent in 2006.[57]

119.    **Despite the dominance of a handful of exporters, the mix of countries has evolved over time.** Traditional European producers such as France, Italy, Spain, Germany, and Portugal remain on the list for all years in the table below. However, the second-largest exporter in 1966, Algeria, disappears from the list before 1986, and newer producers Australia, Chile, and the USA make an appearance after 1986. Moldova makes an appearance in 1996, but is soon overtaken by other producers.
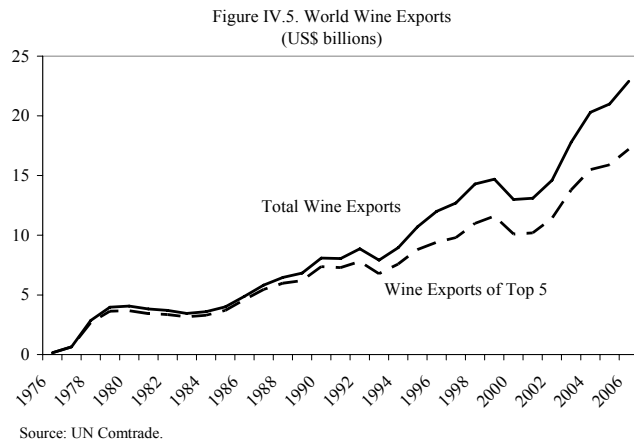


Figure IV.5. World Wine Exports
(US$ billions)

Source: UN Comtrade.

| Table IV.2. Wine Exporter Rank by Value | | | | | |
|---|---|---|---|---|---|
| Wine Exporter Rank | 1966 | 1976 | 1986 | 1996 | 2006 |
| 1 | France | France | France | France | France |
| 2 | Algeria | Italy | Italy | Italy | Italy |
| 3 | Italy | Spain | Spain | Spain | Australia |
| 4 | Spain | Germany | Germany | Portugal | Spain |
| 5 | Portugal | Portugal | Portugal | Germany | Chile |
| 6 | Morocco | Algeria | Yugoslavia | Australia | Germany |
| 7 | Germany | Yugoslavia | USSR | USA | USA |
| 8 | Tunisia | Greece | Greece | Chile | Portugal |
| 9 | Yugoslavia | Austria | Hungary | Moldova | South Africa |
| 10 | Belgium | Hungary | Belgium | South Africa | New Zealand |
| Source: UN Comtrade. | | | | | |

120.    **Despite the growth in exports, wine consumption by volume has been declining.** Particularly in countries with a long tradition of winemaking, this has forced countries to pursue exporting. As much of the decline in consumption has been in everyday table wine, producers are also shifting into higher quality wines, which are less price-sensitive in the export market (Anderson, 2004).

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[57] The relatively small value of wine trade overall stands in curious contrast to its historical importance as a tradable good, and to the large global wine market. Anderson (2001) notes, however, that traditionally only about one-tenth of global wine sales occurred across borders.

## B.   Wine Exporters[58]

121.   **The experiences of different groups of countries offer some lessons for Moldovan wine exports.** The big new exporters have grown very quickly, both in value terms and the number of destinations. They also tend to be larger and richer, with more developed financial institutions. The Eastern European countries have had a more difficult time since the breakup of the Soviet Union, but show some signs of recovery. The Northern African countries, despite having large exports to France historically, were never able to become permanent players in the wine market.

122.   **Of particular interest is how quickly these changes took place, and through which channels.** Exports may increase due to more export destinations, increases in quantity, or higher prices. The most successful exporters pursued a combination of all three, suggesting high levels of innovation in the industry. In this section, brief histories of the countries are discussed, as well as statistics on the sources of wine export growth.

**Big New Wine Exporters**

123.   **The four most successful new wine exporters of the past few decades are Argentina, Australia, Chile, and New Zealand.** While the institutional environments are different in each one, their rapid growth offers hope that a transformation could quickly occur in other countries. Indeed, given the advances in production and marketing techniques spurred by their rise, it is now easier to export wine from new regions. Increases on the scale of Australia are likely not feasible in the short run for the Eastern European countries, but Argentina and Chile are potential models to follow.



Figure IV.6. Total Exports by Country
(US$ millions)
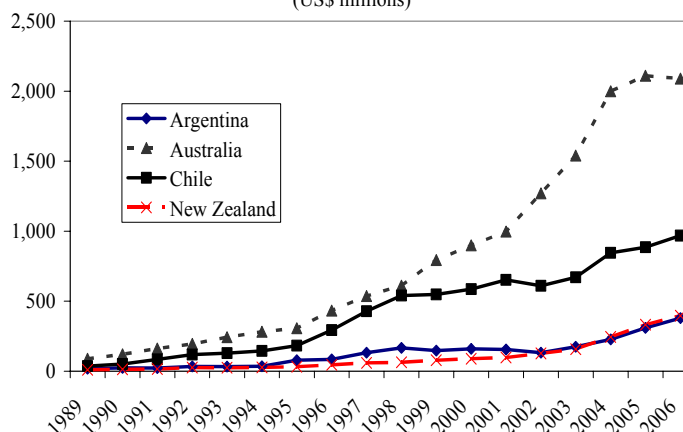
Source: UN Comtrade.

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[58] This section relies on two sources of data, the UN Comtrade database, which covers trade until 2006. However, due to reporting gaps by some countries, this is not as comprehensive as the UN-NBER World Trade Flows database, which covers trade from 1962-2000. The UN-NBER database is also extensively cleaned and corrected for errors. Unfortunately, beginning in 1984, trade flows of less than $100,000 were omitted. As many wine exports were below this level, the number of recorded destinations for wine exporters dropped precipitously. This also leads to biased estimates of when wine is first exported to a partner.

124. **The vast increases in wine exports were not solely due to volume increases**. Prices have risen, albeit modestly in some cases. While this partially reflects inflation over time and exchange rate movements (all prices are calculated in nominal US$), it also reflects improvements in quality. Prices for Chilean and Argentine wine have only risen modestly, but Australian and New Zealand wines now command significant premiums. In the case of New Zealand, some of the wines are produced in limited quantities, but are in high demand among connoisseurs, leading to price spikes.

125. **Argentina has a long tradition of winemaking, but exports were low until recently.** Many European immigrants in the early 1900s brought winemaking with them, but produced mainly table wine. Several varieties of grapes that disappeared in Europe were also retained, which later became a source for growth and differentiation. Falling domestic consumption forced producers to turn to exports.

Figure IV.7. Average Price of Exported Wine
(US$/Liter)
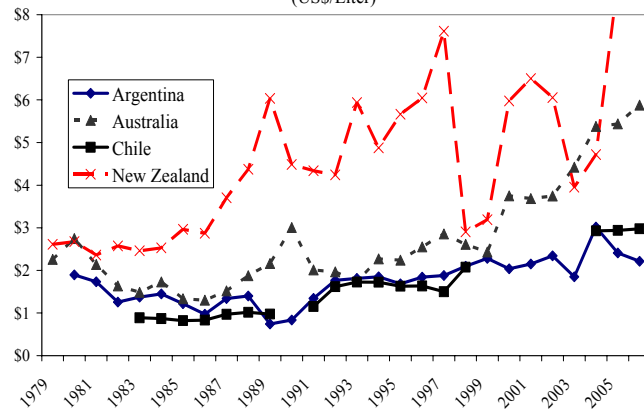


Source: UN Comtrade.

126. **Given the late arrival of Argentina as a large exporter, new destinations comprise a large share of exports.** New destinations are ones for which exports in 1984 were less than $100,000.[59] By 2000, those destinations accounted for almost half of all exports. However, since destinations quadrupled, average exports to new destinations are lower. Despite the lower returns from new markets, collectively they are very profitable, and experience higher rates of growth. As can be seen in the charts

Figure IV.8. Exports by Argentina
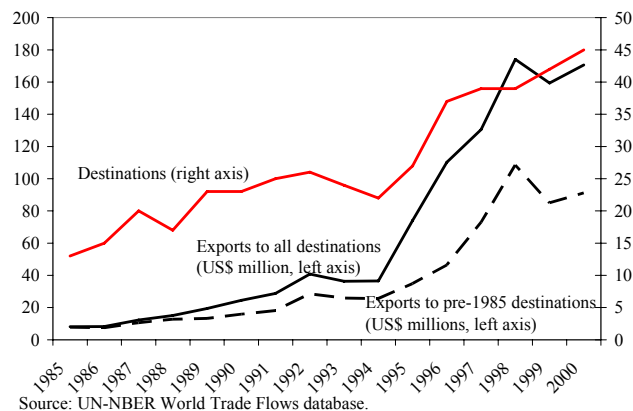


Source: UN-NBER World Trade Flows database.

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[59] Beginning in 1984, trade flows of less than $100,000 were omitted from the UN-NBER World Trade Flows database. As many wine exports were below this level, the number of recorded destinations for wine exporters dropped precipitously. This also leads to biased estimates of when wine is first exported to a partner, but allows for a natural point at which to measure new entry.

for all the big new wine exporters, the number of destinations grow approximately linearly, but the value of exports grows exponentially.

127.    **Overall export growth masks some important variations at the country level**. Annual growth for a country is not always positive, and exports to various destinations can also grow or shrink. The table below gives an indication of how wide these variations can be, with summary statistics for destinations that were added after 1984, but received exports for at least two years, with the additional restriction that exports the previous year were at least $250,000 (this minimizes the high growth rates associated with a low base). While the big new exporters have high average growth rates, all the countries have large standard deviations and wide ranges between minimum and maximum growth rates. As these are country-level flows, the variation in growth rates at the firm level is likely to be even more volatile. This underlines the inherent riskiness of export growth at the disaggregated level, and underscores the need for a financial sector and business environment that can cope with such risks.
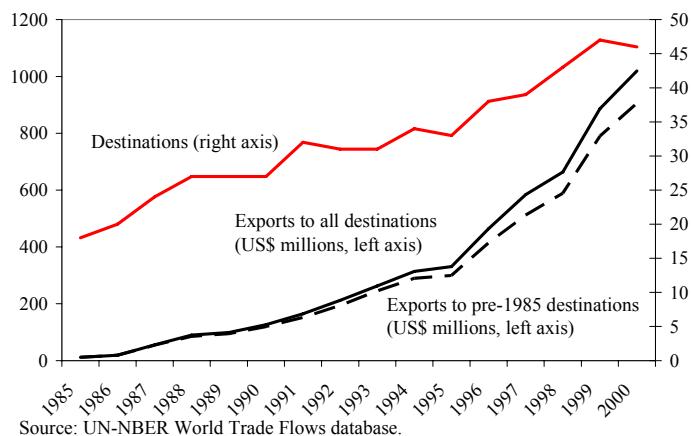
| Table IV.3. Wine Export Growth to New Destinations, 1984 to 2000 | | | | | |
| --- | --- | --- | --- | --- | --- |
| (in percent) | | | | | |
| Country | Average | Standard Dev. | Minimum | Maximum | Observations |
| Argentina | 26.3 | 67.1 | -96.8 | 273.6 | 146 |
| Australia | 26.9 | 65.6 | -89.5 | 402.8 | 124 |
| Chile | 35.5 | 71.6 | -77.1 | 763.9 | 256 |
| New Zealand | 25.6 | 68.3 | -70.1 | 266.3 | 75 |
| Bulgaria | 13.9 | 97.5 | -95.7 | 583.6 | 67 |
| Hungary | -2.4 | 70.4 | -93.5 | 229.4 | 65 |
| Moldova | -10.0 | 84.3 | -89.4 | 305.9 | 33 |
| Romania | 23.0 | 156.0 | -96.8 | 1,170.6 | 69 |

Note: To exclude outliers, only flows with at least two previous years and $250,000 worth of wine before were included.
Source: UN-NBER World Trade Flows.

128.    **Australia is the most successful of the big new wine exporters**. In 2006, it displaced Spain as the third largest wine exporter in the world, and now exports more than $2 billion. A few decades ago, Australian wine was relatively unknown, in contrast with its current high reputation. In response, Australian firms set up marketing subsidiaries to distribute their wines in the U.S., which helped them achieve market penetration. Once retail outlets were more familiar with the wines, however, the wineries moved towards direct sales, cutting out the distributional

Figure IV.9. Exports by Australia

Destinations (right axis)

Exports to all destinations (US$ millions, left axis)

Exports to pre-1985 destinations (US$ millions, left axis)

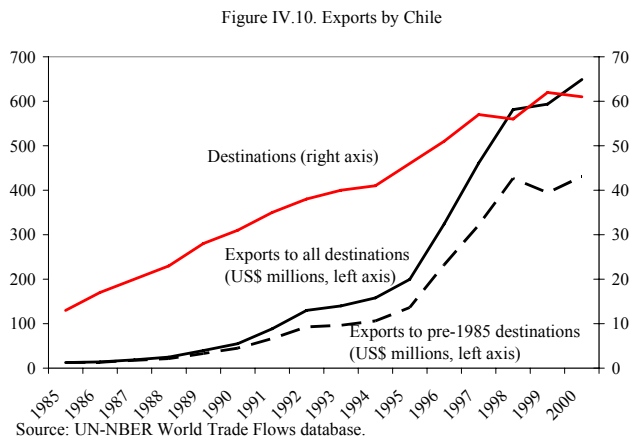Source: UN-NBER World Trade Flows database.

channel (Solana-Rosillo and Abbott, 1998). As it can be an expensive proposition for a winery to set up a subsidiary in a foreign country, the experience of Australian wines shows that it can be a used as a springboard for more decentralized exports later. High levels of research and development expenditure have also helped to make Australia a world leader, but with more accredited winemakers, it is also easier for other countries to benefit.

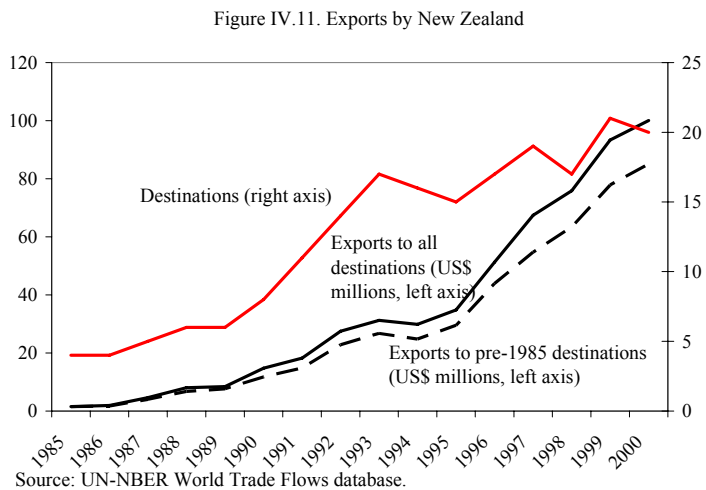129.    **The Chilean wine industry is a model of technological diffusion and private sector-led growth.** Although there was a wine industry geared for the (small) domestic market, it was not until the 1980s when exports began to take off, both in terms of

destinations and value. This growth in exports was fueled by new winemaking techniques brought and shared by a handful of winemakers (Giuliani, 2007, and Walters, 1999). At the same time, the trade and industrial liberalization strategy pursued by the Chilean government offered fertile ground for expansion of profitable enterprises. Most of the innovations were first adopted by small firms, which were then bought or



Figure IV.10. Exports by Chile

Destinations (right axis)

Exports to all destinations (US$ millions, left axis)

Exports to pre-1985 destinations (US$ millions, left axis)

Source: UN-NBER World Trade Flows database.

copied by larger ones once profitable strategies were established.

130.    **New Zealand's strategy has been to pursue higher quality niche wines.** This is

partly dictated by the climate, which is cooler than the other big new wine exporters, and partly dictated by the amount of suitable land for vineyards. While overall export growth has not been as fast as other countries, value-added and prices have increased. This was aided by the willingness of vineyards to invest in newer varieties of grapes and a vibrant research and



Figure IV.11. Exports by New Zealand

Destinations (right axis)

Exports to all destinations (US$ millions, left axis)

Exports to pre-1985 destinations (US$ millions, left axis)

Source: UN-NBER World Trade Flows database.

development community. Smaller wineries[60] in New Zealand are also the impetus for much of the innovation, much as in Chile.

131.    **The number of destinations for New Zealand wines is thus more constrained**. The demand generally comes from high-income individuals in developed countries, although with more wealthy individuals in emerging economies (such as China and India), the set of destinations could also expand.

## Eastern European Producers

132.    **Eastern European producers struggled after the collapse of the Soviet Union**. Bulgaria, Hungary, Moldova, and Romania all have long histories of winemaking, and are ideally placed to export to the EU and CIS countries. However, they all had to address land ownership transfers in the 1990s. Many times, this resulted in very small-scale landholdings. Owners were not always the most efficient farmers, further depressing productivity growth. As property right transfers can be difficult with agricultural land, investments lagged (Abrams and Yossifov, 2003).
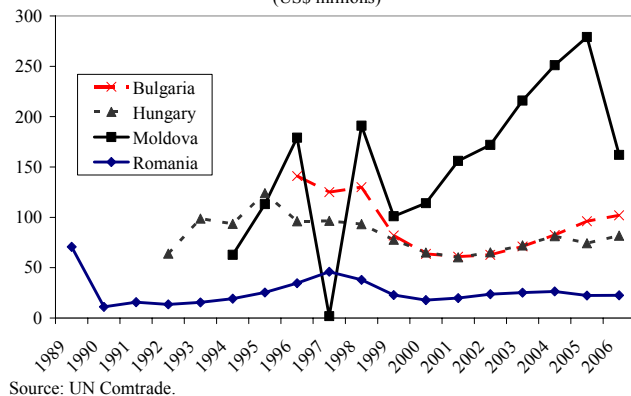
133.    **Wine exports by the Eastern European countries have mostly been flat, except for Moldova.** As Russia has been such a large destination for Moldovan wine, the effects of the Russian crisis in 1998 and the import ban in 2006 can clearly be seen. More positively, Bulgarian wine exports have been trending upwards recently, reflecting strong growth in Russia and Poland.

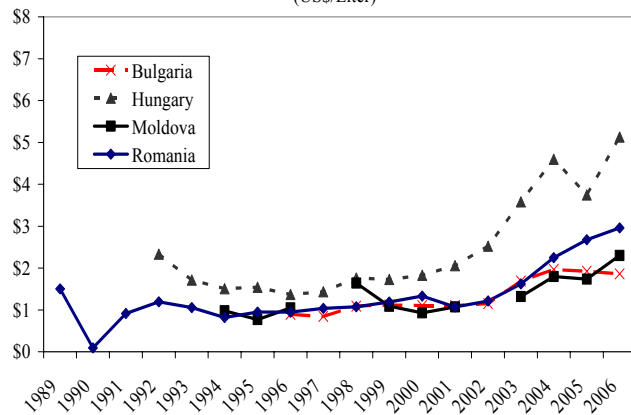134.    **Prices for Eastern European wines are generally low, although comparable to Chile and Argentina**. There is a slight upward trend since 2000, but Romania and Hungary command higher prices, despite (or


Figure IV.12. Total Exports by Country
(US$ millions)
Source: UN Comtrade.


Figure IV.13. Average Price of Exported Wine
(US$/Liter)
Source: UN Comtrade.

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[60] Such as Cloudy Bay, which is widely credited for first adopting the now familiar New Zealand style of Sauvignon Blanc.

perhaps because of) their lower level of overall exports. In particular, prices for Hungarian wine are almost twice as high as for Moldovan wine. Hungary's Tokaj wines still benefit from a strong brand identity, and increasing foreign investment and technological transfer is rapidly raising quality.[61]

135. **The number of destinations for Eastern European exporters is relatively low, with Moldova again an outlier**. Of the big new producers, only New Zealand exports to as few destinations as Bulgaria, Hungary, and Romania. The low number of destinations for Moldovan wine again reflects the predominance of Russia (recall that flows of less than $100,000 are excluded). For both the big new exporters and the Eastern European exporters, the early 1990s were a period of growth, reflected in values and destinations. However, the Eastern European producers were not able to continue serving those new markets, with quality still being uneven and difficulties in increasing production to serve new markets (Noev and Swinnen, 2004).



Figure IV.14. Number of Export Markets by Country

Source: UN-NBER World Trade Flows database.
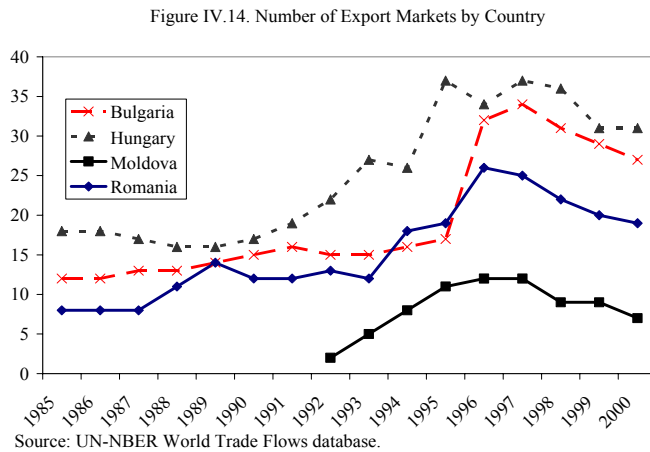
136. **Moldova still faces some impediments to export growth, but is well placed to compete**. Given the importance of the sector for the economy, the wine industry has been extensively studied by donors. Most recently, a report prepared for the U.S. AID in 2007 surveyed Moldova's industry and the global market for wine. It concluded that Moldova has many of the building blocks of a successful wine industry, but that cumbersome regulations hamper growth. A balance needs to be struck between ensuring quality, and allowing for innovation. Among the specific recommendations are reorienting and reorganizing Moldova-Vin, streamlining the regulatory environment, and pursuing skills enhancement.

137. **The accession of Bulgaria and Romania to the EU in 2007 complicated Moldova's diversification of export destinations**. Previously, Moldova had duty-free access to Bulgaria and Romania through the Central European Free Trade Agreement (CEFTA), in addition to access to CIS countries through a separate FTA. However, duty-free access will be granted to Moldovan wine beginning in March 2008 (subject to generous quotas), after an Autonomous Trade Preferences agreement between the EU and Moldova comes into force.

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[61] Eastern Europe is apparently a more common destination for "flying winemakers" to set up their own wineries. See, for example http://www.nytimes.com/2006/10/11/dining/11pour.html.

138.    **Sustained growth, such as experienced by Chile, would contribute hugely to Moldova's development.** Although counterfactuals should always be interpreted with caution, if wine exports grew by 18 percent a year for twelve years beginning in 2008, overall wine exports would be almost $1 billion in 2019.[62] Exports overall grew by roughly 28 percent in 2007, although this partially reflected a rebound after the 2006 Russian ban on imports of Moldovan wine. An important caveat is that Chile's economy is much larger than Moldova's (Chilean GDP was over $100 billion in 2007, in contrast to $4.2 billion), with a more developed financial sector, allowing for higher levels of investment. On the other hand, the world wine market certainly seems able to absorb such large increases in exports.

**Northern African Countries**

139.    **The export experiences of Algeria, Morocco, and Tunisia offer a cautionary tale.** In the 1960s, all three were among the top ten exporters of wine. However, their wine was mostly sent to France, with whom they had long historical ties. After independence, those ties weakend, skilled winemakers left, and physical assets were not maintained or were destroyed. Other countries replaced them, and the Northern African countries never recovered their previous position. Indeed, although in 1965 the three countries exports were 28 percent of the world total, by 2000 their share had fallen to less than 2 percent.

## C.  Conclusion

140.    **This paper surveys the experience of other wine exporters for lessons for Moldova.** The big new exporters, comprising Argentina, Australia, Chile, and New Zealand, have experienced sustained, double-digit growth in wine exports over two decades. The institutional environments and growth strategies of the big new exporters differ, but technological advances and continuing investments are key to sustained growth. However, the overall growth masks some significant volatility in bilateral flows, implying the need for a financial sector and business environment that can cope with significant risk and support innovation. The experiences of other Eastern European countries bears this out; after the breakup of the Soviet Union, Bulgaria, Hungary, and Romania were unable to reorient towards more lucrative markets. The experiences of the Northern African countries follow a similar pattern after the weakening of their ties with France.

141.    **Moldova is well placed to expand exports of wine to new markets**. With a long tradition of winemaking, low labor costs, and a favorable climate, as well as advantageous access to both CIS and EU countries, export growth could accelerate over the near term. The strategy pursued by the government in streamlining regulations could also bear fruit in the

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[62] Moldovan wine exports in 2007 were roughly $136 million, and Chilean wine exports in 1993 were $129 million. Chilean wine export growth from 1994 to 2006 averaged 18 percent.

wine sector, given the needs for investments and new technology. Despite the romantic image of the industry, it is clear from other countries experiences that wine has much more in common with industrial goods than with agricultural commodities. Capital investments, marketing, and distribution networks are all crucial to export success. While there are economies of scale to marketing and distribution initially, in other countries much of the innovation has been driven by smaller firms. All these factors point to the continuing need to improve Moldova's business environment.

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