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MODELS OF FOREIGN DIRECT INVESTMENTS. STUDY CASE ON ROMANIA

Mihai ROMAN*

* The Bucharest Academy of Economic Studies, Romania

Abstract: Economic growth, foreign direct investments and sustainability are basic issues in contemporary economies. Theoretical aspects on sustainability were developed especially after '80's, when debt rate as percent in GDP increases dramatically in developed countries. One question difficult to answer is that foreign direct investments (FDI) must be included in current account deficit sustainability level. FDI is more stable than financial flows due the fact that foreign investors have long term contracts. FDI also increase exports and improves external balance. In transition countries, dynamics of fiscal processes affected consumption, internal and foreign investments and growth.

In this context, there is interesting to study the relationship between foreign direct investment and economic growth in transition countries, especially in Romania. There are different models that analyze relationship between growth and FDI. Lucas' model (2003) shows that it is possible to lose welfare on short term due on unexpected shocks, but on long term we find consumption increased level. Martin and Roger (1997) and Blackburn (1999) models also shows how technological shocks affects growth and FDI.

To analyze the effects of FDI on Romanian growth we use a neoclassical model with Cobb-Douglas production functions. Our basic results show that Romanian economic growth was positively influenced by fiscal policy, FDI and also by adhesion to EU. Using Bohn reaction function we find also that economic growth are positively correlated with public debt level and FDI and negatively correlated with unemployment rate and Romanian political cycles.

Key words: FDI, growth, unemployment, consumption

1. INTRODUCTION

Economic growth, foreign direct investments and sustainability are basic issues in contemporary economies. Theoretical aspects on sustainability were developed especially after '80's, when debt rate as percent in GDP increases dramatically in developed countries.

One question difficult to answer is that foreign direct investments (FDI) must be

included in current account deficit sustainability level. FDI is more stable than financial flows due the fact that foreign investors have long term contracts. FDI also increase exports and improves external balance. In transition countries, dynamics of fiscal processes affected consumption, internal and foreign investments and growth.

In this context, it is interesting to study the relationship between foreign direct

investment and economic growth in transition countries, especially in Romania.

Central and Eastern Europe countries are looking for FDI as a critical component to solving capital deficit problem. Consequently, economic research identifies two different types of analysis: studies focused on growth financing capacity and studies focused on global impact of FDI on growth. Various results argued that FDI is a direct result of growth but other studies shows that FDI generate economic growth. It is a reality that countries with extended rates of FDI/ GDP had greater growth rates. Also, resources efficient allocation increase economic growth.

To analyze different advantages and disadvantages of foreign capital and banks on national economies we need to detect transmission channels of there activities on Central and East Europeans economies.

2. CHANNEL EFFICIENCY

Generally, banks efficiency gains at microeconomic level depend on managerial efficiency and on scale efficiency. FDI can increase managerial costs or profit efficiency by transferring banking managing systems from outside to national representatives or by transferring new banking technologies and products. At macroeconomic level, efficiency gains results from risks diversification, reducing transaction costs, efficient allocation and utilizing of financial resources, all this increasing banking system welfare and stability. An efficient banking system exists with a low profit rate depending on interest, so it is possible to intensify investments and increase economic growth. Central and East Europeans financial markets indicates high levels of foreign proprieties (Domanski, 2005) that crucially influence FDI and domestic banking structure. But it is obvious that “foreign” does not reflect necessary a greater efficiency. Bonin (2004) argue that privatized banks by endorsement was less efficient that other banks privatized by another methods. Domestic banks had competitive advantages due on local clients’ previous contacts. From economies of scales foreign banks are not more efficient than domestic ones. That

depends on modernizing expenses necessary to make viable purchased banks. Cost reduction will be effective only after a shortest or longest period.

Drakos (2003) shows that after Central and East European’s institutional reforms start a competition between national and foreign banks. Generally, new investors represent new competitors, so banks acquisitions increase competition by new policies applied by new owners. In national banks can resists to foreign banks competition then domestic market efficiency will be improved (Claessens, 2001). A negative effect of this type of competition is an increased level of financial market concentration. Mamatzakis (2005) shows that an increased countries monopolistic financial market from Central and East European’s (in 1998-2002 period) reduce efficiency growth. External shocks had also a negative effect on financial efficiency, especially due on restriction of foreign operations (contagious effect). Eller (2005) shows that privatization and foreign proprieties in Central and East European’s Countries improve capital allocation efficiency. If these gains are transmitted to clients by lower prices for products and services then interest rate will decrease and investments will increase. Following Levine (1997) greater financial sector efficiency will reduce transactional costs. If it is possible to quickly obtain reduced cost capital then companies increase development and growth.

Any case, FDI can improve financial market efficiency. Entire financial environment must improve efficiency, so interest rates decrease and national and foreign investments increase.

External financial flows increase especially after 1990’s. For examples, in 2003 for CEE’s -10 we find a FDI mean level at 19% in GDP.

There exists a paper Mencinger (2003) that shows a negative relationship between growth rate and FDI level for some Central and East Europeans countries. Even his result is incorrect, that shows it is possible to obtain for some periods a not increasing effect of FDI on growth for Central and East Europeans Countries.



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3. THE MODEL

We start with a standard neoclassical production function in perfect competition and constant return to scale:

$$Y = AK^\alpha H^\beta L^{1-\alpha-\beta} \quad (1)$$

where: Y is production level (GDP level), A is a total productivity index (or an index of global productivity), K represent physical capital, H is human capital and L is used labour force, α represent capital elasticity and β represent human capital elasticity. We can rewrite equation (1) by intermediary of labour productivity, $y = Y / L$, capital-labour ratio, $k = K / L$ and human capital-labour ratio, $h = H / L$:

$$y = Ak^\alpha h^\beta \quad (2)$$

Using a cross intertemporal section and first difference logarithmical equation we found equation (3) (i is country index and t is time index):

$$\Delta \ln(y_{it}) = \Delta \ln(A_{it}) + \alpha \Delta \ln(k_{it}) + \beta \Delta \ln(h_{it}) \quad (3)$$

But how is possible to include FDI in equation (3)? We have three theoretical points of view describing relationship between growth and FDI. First one include FDI in physical capital, K (positively or negatively, depending on flows direction). Second one includes FDI in human capital due on new knowledge added by foreign capital. Third one argues that global productivity, A , is positively influenced by FDI.

We suppose FDI influences global productivity especially, because financial capital does not affect directly physical capital or human capital. We suppose to have an exogenous component, (γ_{A0}) and also a direct influence of FDI:

$$\Delta \ln(A_{it}) = \gamma_{A0} + \gamma_{A1} \Delta \ln(FSFDI_{it}) \quad (4a)$$

$$\Delta \ln(A_{it}) = \gamma_{A0}^p + \gamma_{A1}^p FSFDI_{it} \quad (4b)$$

Replacing (4a) and (4b) in (3) we obtain two equations than can be tested. Equation (5a) describes FDI's temporal efficiency growth and equation (5b) describes permanent efficiency influence of FDI.

$$\ln(y_{it}) = \gamma_{A0} + \gamma_{A1} \ln(FSFDI_{it}) + \alpha \ln(k_{it}) + \beta \ln(h_{it}) \quad (5a)$$

$$\ln(y_{it}) = \gamma_{A0}^p + \gamma_{A1}^p FSFDI_{it} + \alpha \ln(k_{it}) + \beta \Delta \ln(h_{it}) \quad (5b)$$

Other instrumental variables that can be used to analyze growth are public sector dimension, inflation rate or trade openness.

Public sector dimension will be estimated by government consumption ratio in GDP (GC). Following Barro and Sala-i-Martin (1995) government consumption are a good proxy to estimate political measures and also direct effects of unproductive public expenses. Other studies show that government consumption had a negative relationship with economic growth. But there are a paper of Bassanini and Scarpetta (2001) showing that tax control and public investment control have a positive effect on growth.

Including inflation as conditional variable depend on Okun's law (that suggests an inverse relationship between growth and unemployment rate, or a direct and positive relationship with inflation). Other authors argue that transition economies are characterized by higher levels of inflation that negative influences growth, especially on restructuring debut. Higher inflation affects long term financial contracts so we obtain a negative relationship between inflation and growth. Khan and Senhadji (2000) and also Wachtel and Rousseau (2002) show that there exist a limit level of inflation that influence relationship growth-financing. As a consequence, empirical studies on finance-growth in transition economies include inflation and FDI flows as control variables

(Mamatzakakis, Cottarelli, 2005) (relationship (6a) and (6b) :

$$\ln(y_{it}) = \gamma_{A0} + \gamma_{A1} \ln(FSFDI_{it}) + \alpha \ln(k_{it}) + \beta \ln(h_{it}) + \phi_1 \ln(GC_{it}) + \phi_2 \pi_{it} \quad (6a)$$

$$\ln(y_{it}) = \gamma_{A0}^p + \gamma_{A1}^p FSFDI_{it} + \alpha \ln(k_{it}) + \beta \ln(h_{it}) + \phi_1 \ln(GC_{it}) + \phi_2 \pi_{it} \quad (6b)$$

These relationships represent our model's theoretical base. We expect γ , α , and β to be positive coefficients, ϕ_1 negative and ϕ_2 with ambiguous sign (due on fact that FDI's effects are lagged).

Efficiency and budget constraint

Previous models presents accumulation rate depending on trade goods sector profitability. In our model we consider the relationship between accumulation rate (I/K) and saving rate (depending on capital stock, S/K) and also on current account deficit.

$$I/K = S/K + TD/K \quad (7)$$

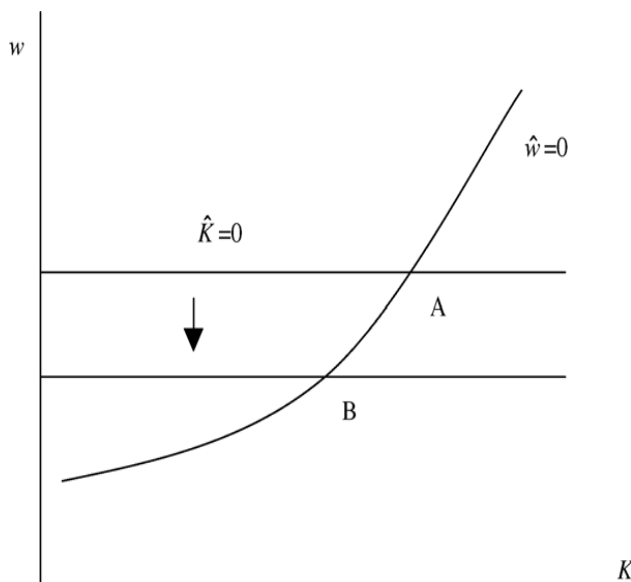


Figure 1. Currency overvaluation and equilibrium line.

A contraction of monetary policy over evaluates currency and equilibrium line goes down, with a reduction of capital stock growth rate. We obtain a reduction of export level and an increasing import level. As results, we obtain an increased trade deficit and a devaluation of exchange rate. Equilibrium line

$\hat{K}=0$ goes down and equilibrium level indicates salaries and capital reduction rate (see figure 1).

4. FOREIGN DIRECT INVESTMENTS IN ROMANIA

IMF, WB, OECD or UNCTAD consider *control* and *long term interest* as key word in FDI's evaluation and as source of foreign portfolio investments differentiation. One possible definition of FDI is:

“FDI represent a long-term investment relationship between a resident entity and a non-resident one; it usually implies a significant degree of influence from the investor on the management of the direct investment enterprise in which he/she invested.”

Conceptually, foreign direct investment supposes tangible or intangible actives internalization with some restrictions:

- Economic agents are from different national spaces: investor are from origin country and direct investment is made in host country;
- We found a long term interest of investor;
- Investor controls his investment.

There is not a common practice about FDI content. But, almost all authors and international organisms consider FDI flows the following: paid-up capital and the reserves related to a non-resident investor owning at least 10 percent in the subscribed share capital of a resident enterprise, the loans between this investor and the enterprise he/she invested in, as well as the reinvested earnings. So, FDI is not only from transnational companies, there are physical persons, investment funds or firms that are contributing to FDI flows. But transnational companies realize the majority of foreign direct investments especially by international mergers and acquisitions.

FDI's liberalization helps transnational expansion and increase industrial production in whole world. In this case FDI represents a market integration mechanism and also a link between national productive systems.



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In Romania, in 2005 FDI's level was at 5213 billions Euros, 51.6% represent social capital investments. There are especially money transfers (99.5%) and a reduced 0.5 % in nature. Also, credit level of foreign investors was at 1670 billions Euros in 2005. In Bucharest - Ilfov region was 60.6% level of total FDI, follow by South-East region (due on Constanta, Galati and Braila harbors).

Industry represents 48.8 % in total investments (in metallurgical industry 77.3% level). Investments in services sector represent 20% in total, 14.5% in Insurance and financial intermediation sector. (see Figure 2.)

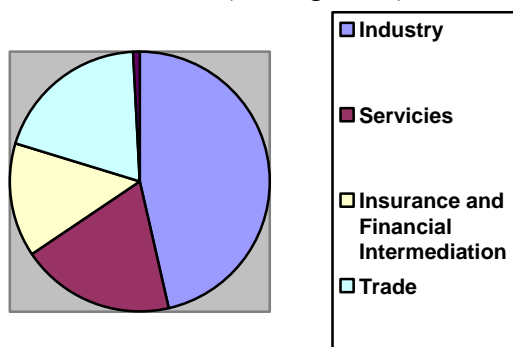


Figure 2. FDI's structure in 2005 year

The statistical survey conducted by the National Bank of Romania and the National Institute of Statistics in 2006 shows an increasing amount of FDI. Net FDI flows amounted to EUR 9,059 million, up 74 percent year on year, of which: equity stakes were worth EUR 4,159 million, accounting for 46 percent of net FDI flows; net reinvested earnings in amount of EUR 2,673 million, making up 30 percent of net flows; net credit received from foreign investors ran at EUR 2,227 million, holding 24 percent of net FDI flow.

The FDI stock at end-2006 reached EUR 34,512 million, up 58 percent year on year, of which: equity stakes in amount of EUR 27,016 million, making up 78 percent of the stock; net credit received from foreign direct

investors was EUR 7,496 million, i.e. 22 percent of the stock.

By economic activity (according to NACE Rev. 1), the bulk of FDI went to manufacturing (34.2 percent of total investment), with metallurgy (8.3 percent), food, beverages and tobacco (5.5 percent), oil processing, chemicals, rubber and plastics (4.5 percent), and transport means (4.1 percent) holding significant weights (see figure 3) .

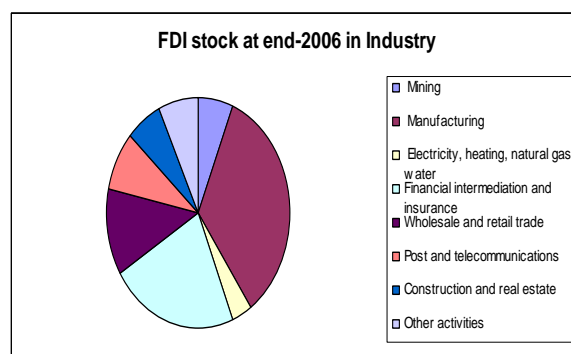


Figure 3.

Significant FDI was channeled into financial intermediation and insurance, banking and insurance included (22.2 percent of total FDI), wholesale and retail trade (12.2 percent), telecommunications (8.2 percent), construction and real estate (6.4 percent), and services rendered to enterprises (4.1 percent).

Tangible and intangible fixed assets, with a stock of EUR 17,174 million at end-2006, accounted for 50 percent of total FDI, thus inducing a considerable degree of foreign investment durability.

Substantial FDI in tangible and intangible fixed assets was recorded in: industry (28.9 percent of total FDI), namely manufacturing (22 percent of total FDI, special mention deserving metallurgy on 5.5 percent of total FDI), wholesale and retail trade (6.4 percent), telecommunications (4.8 percent), which largely overlap the fields benefiting

from most of FDI.

EUR million

| | Exports (FOB) | | Imports (CIF) | |
|----------------------------|---------------------------------------|---------------------------|---------------------------------------|---------------------------|
| | Foreign direct investment enterprises | % of total economy/sector | Foreign direct investment enterprises | % of total economy/sector |
| TOTAL, of which: | 18,733.8 | 72.5 | 23,767.9 | 58.6 |
| Industry, of which: | 16,999.9 | 75.9 | 15,895.8 | 76.3 |
| • Manufacturing | 15,839.7 | 75.2 | 14,914.6 | 76.3 |
| Wholesale and retail trade | 1,437.7 | 52.8 | 5,788.8 | 42.7 |
| Other activities | 296.3 | 41.8 | 2,083.3 | 33.8 |

Table 1. Exports and imports based on FDI enterprises

Turnover of foreign direct investment enterprises totaling EUR 74,309.9 million took 43.2 percent of turnover reported by Romanian enterprises. The activities that were accountable for the highest turnover figures were industry, namely manufacturing (55.4 percent and 59 percent respectively of the sector's turnover), post and telecommunications (77.5 percent), trade (39.9 percent) and services rendered to enterprises (36.9 percent).

The activity of foreign direct investment enterprises as a whole has a favorable impact on Romania's trade balance, its contribution to exports and imports being 72.5 percent and 58.6 percent respectively (see table 1).

The distribution took into account the country of origin of the direct holder of at least 10 percent in the resident foreign direct investment enterprises' share capital on an "immediate country" basis.

The top-five countries in order of their weights in FDI stock as at 31 December 2006 were the following: Austria (23 percent compared with only 15.4 percent a year earlier), the Netherlands (17.1 percent, down from 19.5 percent in 2005), Germany and France (10.1 percent and 8 percent respectively, staying flat on a year earlier), and Greece (7.8 percent, down slightly year on year).

| | Mn. Euros | % |
|--------------------------|---------------|--------------|
| TOTAL, of which: | 34,512 | 100.0 |
| Austria | 7,942 | 23.0 |
| The Netherlands | 5,887 | 17.1 |
| Germany | 3,473 | 10.1 |
| France | 2,766 | 8.0 |
| Greece | 2,680 | 7.8 |
| Switzerland | 2,372 | 6.9 |
| Italy | 2,322 | 6.7 |
| Cyprus | 1,674 | 4.8 |
| Hungary | 663 | 1.9 |
| United States of America | 628 | 1.8 |
| Other | 4,105 | 11.9 |

Table 2. FDI's distribution took into account origin country

From a territorial perspective, FDI went mainly to Bucharest-Ilfov region (64.3 percent); other development regions receiving significant FDI inflows were the SOUTH-EAST region (7.7 percent), the CENTRE region (7.4 percent), the SOUTH region and the WEST region (on 6.5 percent and 5.6 percent respectively).

In 2008, FDI growth up to 92.2% at the end of April, at 3.21 bilions Euros. Current account deficit from the first trimester was covered 66.5 % from FDI flow.

5. FDI AND ROMANIAN ECONOMIC GROWTH

Mathematical model starts with a neoclassical Cobb-Douglas production function:

$$Y = AK^\alpha H^\beta L^\delta \quad (1)$$

Where: Y is production level (GDP level), A is a total productivity index (or an index of global productivity), K represent physical capital, H is human capital and L is used labour force, α represent capital elasticity, β represent human capital elasticity and δ represent labour elasticity.

Data set covers the period 1990-2009 and the values are comparable, being expressed in 1990 prices.



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Physical capital (K) is represented by tangible fixed assets, human capital (H) is represented by Romanian population, labour force (L) is represented by average number of employees, FSFDI is foreign direct investments, GC is government consumption and Y is GDP level.

Estimating production function (using E-views program) we obtain:

$$Y = 32.02 \cdot K^{-9.199} \cdot H^{0.114} \cdot L^{1.111}$$

So, labor and human capital contribution to GDP dynamics are positives ones, but unexpected, capital contribution is negative. This result is based especially on reevaluation of physical capital in analyzed period. We can observe also the most important influence on GDP evolution is labor contribution, with 1.11 %.

Second estimated relationship is:

$$\ln(y_{it}) = \gamma_{A0} + \gamma_{A1} \ln(FSFDI_{it}) + \alpha \ln(k_{it}) + \beta \ln(h_{it})$$

Estimated equation is:

$$\ln(y_{it}) = 6.69 + 0.082 \cdot \ln(FSFDI_{it}) + 0.131 \cdot \ln(k_{it}) - 1.004 \cdot \ln(h_{it})$$

Analyzing results we can observe that FDI and labour endowment are positively correlated with GDP evolution, but human capital/labour ratio is negatively correlated with GDP evolution. This result depends especially on Romanian population reduction in analyzed period.

Third estimated relationship is:

$$\ln(y_{it}) = \gamma_{A0} + \gamma_{A1} \ln(FSFDI_{it}) + \alpha \ln(k_{it}) + \beta \ln(h_{it}) + \phi_1 \ln(GC_{it})$$

Estimated equation is:

$$\ln(y_{it}) = 2.425 + 0.078 \cdot \ln(FSFDI_{it}) + 0.0477 \cdot \ln(k_{it}) + 0.2004 \ln(h_{it}) + 0.7168 \cdot \ln(GC_{it})$$

In this equation all factors are positively correlated with GDP evolution. Government consumption had a positive influence on GDP growth with 0.716 percent, the greater influence on all factors. Unexpected, FDI's influence on GDP is small, with only 0.078%.

All equation are significant, t-tests are relevant with a 95% probability.

Prognosis

Using previous equations we conduct a three-scenario prognosis to evaluate future GDP evolution. The three scenarios are an optimistic one, a pessimistic one and a medium evolution scenario. Main hypothesis regarding our scenarios are described in table 3.

In optimistic scenario we suppose that population follow trend line in last 20 years and decline by 1%, physical capital rise with 15%, labour rise with 6%, FDI rise with 10% and government consumption rise with 5 % every year.

| Scenario | Variables (growth ratio) | | | | |
|-------------|--------------------------|------------------------|--------------|-------|-------------------------------|
| | Human Capital (H) % | Physical Capital (K) % | Labour (L) % | FDI % | Government consumption (GC) % |
| Optimistic | - 1 | 15 | 6 | 10 | 5 |
| Medium | -1 | 4 | 1 | 5 | 2 |
| Pessimistic | -.5 | 2 | -2 | -1 | -1 |

Table 3. Variable values from prognosis horizon

In medium scenario we suppose that also population follow decline by 1%, physical capital rise with 4%, labour rise with 1%, FDI rise with 5% and government consumption rise with 2 % every year. In pessimistic scenario we suppose that population decline by .5%, physical capital rise with only 2%, labour decline with 2%, FDI decline with 1% and government consumption decline with 1 % every year.

GDP evolutions for three analyzed models are depicted in Table 4.

We can observe that all three models offer practically same evolution of GDP.

| Year | Model 1 | | | Model 2 | | | Model 3 | | |
|------|---------|------|--------|---------|--------|--------|---------|--------|--------|
| | O S | MS | P S | OS | M S | P S | OS | M S | P S |
| 2011 | 8,75 | 5,8 | 1,33 | 7,12 | 2,29 | 0,29 | 8,12 | 4,51 | 0,80 |
| 2012 | 10,9 | 5,28 | 2,57 | 7,55 | 3,88 | 0,40 | 8,75 | 4,71 | 0,61 |
| 2013 | 8,80 | 4,80 | 3,79 | 6,98 | 4,16 | 0,79 | 7,96 | 4,78 | 1,11 |
| 2014 | 8,71 | 4,66 | 1,56 | 7,87 | 3,83 | 0,34 | 8,62 | 4,33 | 0,37 |
| 2015 | 8,57 | 5,95 | 2,33 | 8,27 | 4,47 | 0,18 | 8,02 | 4,17 | 0,77 |

Legend: OS = Optimistic Scenario, MS = Medium Scenario, PS = Pessimistic Scenario

Table 4. GDP dynamics in 2008-2012 periods (percent)

In optimistic scenarios we can observe GDP mean growth rates between 8 and 10%, with a peak in 2009 and practically stabilized levels in 2010-2012 periods.

Mean scenarios shows GDP mean growth rates at 4.5 percent, with variations between 2.29% and 5.8%.

In pessimistic scenario GDP growth is a disappointing one, with only a 1.12% mean rate, but it is possible to obtain even decreasing levels of GDP.

5. CONCLUSIONS

Foreign direct investments are a dynamic source of GDP growth in emerging countries and an important source of financial support.

Most countries developed faster and better based on cash-flows and direct foreign investments, but also due on new technologies, restructuring national sectors and increased productivity and efficiency. FDI can constitute at this moment a possible way to develop emerging countries and to reduce differences between developing countries and developed ones. Capital flows are influenced not only by country risk, but also from global and international factors. Actual financial international crisis have a negative influence on global economy. We expect to find a reduction of foreign direct investments in any country and any possible way to invest.

Our models suggest importance of labor, capital and FDI flows for Romanian economy. Our scenarios shows that it is

possible, due on bad national and international conditions, to reduce GDP growth rate to a disappointing 1% level after 9 years of development. If political and economical decisions will be appropriate ones, then it will be possible to obtain for next 5 years a 4.5 % GDP rate increase.

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