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Determinants of Foreign

Direct Investment in Georgia

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Abstract

Foreign direct investment (FDI) brings host countries capital, productive facilities, and technology transfers, as well as new jobs and management expertise. Thus it is important to understand why in many countries FDI inflow is lower than it would be expected. The goal of this study is to investigate factors determining flow of FDI in Georgia. The key point of the analysis is the impact of stability of economic and legal environment on the pattern of FDI. In particular, we show that (i) the variability of basic macroeconomic fundamentals decreases the flow of FDI, (ii) high volatility of fiscal, business regulations makes FDI smaller, (iii) unstable economic environment does not attract long term investors but mainly speculative capital. Based on theoretical findings we formulate clear message to policy makers stating that in order to expect significant flow of long term and non-speculative foreign capital, first of all, a stable economic and legal environment is needed.

I. Introduction

The increasing openness of former Soviet Union (FSU) countries has led not only to expanded trade but also to significant increase in foreign direct investment (FDI). Currently, FDI is at the forefront of economic policy decisions in most of these countries, as it is expected to aid in the successful transition to a market economy, improve economic growth prospects, bring modern technology to the economy and to accelerate enterprise restructuring. In fact, among the developing and transition countries of both Europe and Asia, the fastest growing ones are the biggest recipients of FDI. The empirical evidence suggests that for emerging economies, a one percentage point increase in FDI (measured as a proportion of GDP) leads, *ceteris paribus*, to an extra 0.8 percentage point increase in per-capita income (Bergsman, Broadman, Drebentsov, 2000). Moreover, FDI brings at least four things of value: financial capital, management skills, technology, and access to export markets, and therefore sustains growth.

FDI differs from other forms of international capital movement in the manner and duration of the commitment it involves. In particular, its purpose is to establish permanent commercial relations, and at the same time to exert a noticeable managerial influence over an enterprise. It is widely agreed that FDI takes place when three sets of determining factors exist simultaneously (Dunning, 1993, Rugman, 1998):

- *Ownership specific advantages* (of property rights and intangible assets). They arise from the firm's size and access to markets and resources, the firm's ability to co-ordinate complementary activities, such as manufacturing and distribution, and the ability to exploit differences between countries.

- *Internalization incentive advantages*, which arise from exploiting imperfections in external markets. These include the reduction of uncertainty and transactions costs in order to generate knowledge more efficiently; and the reduction of state-generated imperfections such as tariffs, foreign exchange controls, and subsidies.

- *Location specific advantages*, which include differences in country natural endowments, transport costs, macroeconomic stability¹, cultural factors and government regulations. They determine which countries are host to multinational enterprises foreign production.

If only the first condition is met, firms will rely on exports, licensing or the sale of patents to service a foreign market. In the presence of internalization incentives (e.g.

¹ See e.g., Bailey and Tavlas (1991), Cukrowski (2001), Cushman (1985), Goldberg and Kolstad (1995), Sung and Lapan (2000).

protection from supply disruptions and price hikes, lack of suitable licensee, and economies of common governance) FDI becomes the preferred mode of servicing foreign markets, but only if location-specific advantages are present. Within the trinity of conditions for FDI to occur, *locational determinants* are the only ones that host governments can influence directly².

Whereas it has not been possible to arrange firms' locational-specific decisions into a uniform theoretical pattern so far, the literature cites a large number of very different factors that impact on business potential and the risks associated with individual locations. They can be grouped into three broad categories:

– *National policy framework for FDI*. Without specific foreign investment legislation no FDI will take place in a particular country. However, it has to be acknowledged, that while the investment policy restrictions are very important in discouraging foreign investment, investment policy incentives are only one variable attracting such investment³.

– *Business facilitation*. The set of measures that facilitate business transactions includes business promotion, investment incentives, after-investment services, improvements in amenities, and measures that reduce the "hassle" cost (related to corruption and administrative efficiency) of doing business. Financial or fiscal incentives are also used to attract investors, even though they typically figure into investor' location decisions only when the economic determinants are in place⁴.

– *Economic motives*. The most important determinants for the location of FDI are economic considerations. They come into full play once an enabling FDI policy framework is in place. Following from the principal motivations for investing in foreign countries, economic determinants can be grouped into three clusters, such as resource-seeking, market-seeking and efficiency-seeking, as showed in Table I.

Availability of natural resources, cheap unskilled or semi-skilled labor, creative assets and physical infrastructure promotes *resource-seeking activities*. Historically, the most important host country determinant of FDI has been the availability of natural resources, e.g. minerals, raw materials and agricultural products. In the nineteenth century "much of the FDI by European and United States firms was prompted by the need to secure an economic and reliable source of minerals, primary products for the investing industrializing nations of Europe and North America" (Dunning, 1993). Up to the Second World War, about 60% of the world stock of FDI was in natural resources. However, even when it was prominent as an FDI determinant, the presence of natural resources by itself was not sufficient for FDI to take place. Comparative advantage in natural resources

² World Investment Report: Trends and Determinants (1998).

³ See Survey of OECD Work on International Investment (1998).

⁴ See Mallampally and Sauvart (1999).

usually gave rise to trade rather than to FDI. Investment took place when resource-abundant countries either lacked the large amounts of capital typically required for resource-extraction or did not have the technical skills needed to extract or sell raw materials to the rest of the world. In addition, infrastructure facilities for getting the raw materials out of the host country and to its final destination had to be in place or needed to be created⁵.

Table I. Host country determinants of FDI

Host country determinants	Type of FDI classified by motives of firms	Principal economic determinants in host countries
<p>Policy framework for FDI Economic, political, and social stability Rules regarding entry and operations Standards of treatment of foreign affiliates Policies on functioning and structure of markets (especially competition and policies governing mergers and acquisitions) International agreements on FDI Privatization policy Trade policy (tariffs and nontariff barriers) and coherence of FDI and trade policies Tax policy</p>	<p>Market-seeking</p>	<p>Market size and per capita income Market growth Access to regional and global markets Country-specific consumer preferences Structure of markets</p>
<p>Economic determinants</p>		<p>Resource/asset-seeking</p>
<p>Business facilitation Investment promotion (including image-building and investment-generating activities and investment-facilitation services) Investment incentives Hassle costs (related to corruption and administrative efficiency) Social amenities (for example, bilingual schools, quality of life) After-investment services</p>	<p>Efficiency seeking</p>	

Source: UNCTAD, World Investment Report 1998: Trends and Determinants. Table IV.1. p.91.

⁵ See World Investment Report: Trends and Determinants (1998).

Labor-seeking investment is usually undertaken by manufacturing and service multinational enterprises from countries with high real labor costs, which set up or acquire subsidiaries in countries with lower real labor costs to supply labor intensive intermediate or final products. Frequently, to attract such production, host countries have set up free trade or export processing zones (Dunning, 1993). Another highly important group of economic determinants of FDI is called *market factors*, which are market size, in absolute terms as well as in relation to the size and income of its population, and market growth. For firms, new markets provide a chance to stay competitive and grow within the industry as well as achieve scale and scope economies.

The motivation of *efficiency seeking* FDI is to rationalize the structure of established resource based or market-seeking investment in such a way that the investing company can gain from the common governance of geographically dispersed activities. The intention of the efficiency seeking firms is to take advantage of different factor endowments, cultures, institutional arrangements, economic systems and policies, and market structures by concentrating production in a limited number of locations to supply multiple markets. Moreover, in order for efficiency seeking foreign production to take place, macroeconomic and political situation has to be stable, cross-border markets must be both well developed and open.

In the analysis presented in this paper we will focus on the link between macroeconomic and legal stability and inflow of FDI. These factors seem to be of great importance when multinational enterprises have to choose investment location, and when several countries offer similar conditions to attract FDI. Furthermore, we intend to show that macroeconomic and legal instability leads to adverse selection of the investors and prove that in order to expect significant inflow of long term and non-speculative foreign capital a stable economic and legal environment is needed.

The paper is organized as follows. Section 2 characterizes inflow of FDI to Georgia. Section 3 focuses on FDI environment in Georgia. In particular we discuss development of legislative framework, and variability of macroeconomic conditions. In Section 4 we present and analyze a simple model of FDI decision making under uncertainty of economic and legal environment. Section 5 presents international experience in reforming FDI regime and Section 6 concludes.

2. Inflow of FDI to Georgia

Georgia should take full advantage of benefits associated with FDI inflow. Given the country's geographical location, endowment, natural conditions and skilled labor force, as

well as potential access to large markets, this might seem as not too difficult task. Yet the FDI record is rather discouraging. In spite of explicit efforts by government to attract investors, Georgia has received far less FDI than it could. Since 1996, cumulative FDI inflows to Georgia has been equal only to US\$ 720.8 million. This level is very low in light of Georgia's economic potential. It is also very low relative to other transition countries of the region. On per capita basis FDI in Georgia (in 1999) was about US\$ 20, compared to US\$ 91 in Azerbaijan and US\$ 28 in Armenia. The amount of FDI inflow as a share of

Table 2. Indicators of FDI in selected transition economies in 1998 and 1999

	FDI inflow (million US\$)		FDI inflow per capita (US\$)		(FDI inflow)/GDP (percent)	
	1998	1999	1998	1999	1998	1999
<i>Eastern Europe*</i>	14162	17245**	132	162**	3,7	4,7**
Czech Republic	2720	5108	265	498	4,9	9,6
Hungary	2036	1944	201	193	4,3	4,0
Poland	5129	6757	132	174	3,3	4,4
<i>Baltic states</i>	1863	981**	247	131**	8,3	4,4**
Estonia	581	361**	406	256**	11,2	7,1**
Latvia	357	270**	147	113**	5,6	4,1**
Lithuania	926	350**	251	95**	8,6	3,3**
<i>CIS</i>	6791	5539	24	19	1,8	2,0
Armenia	232	100	66	28	12,3	5,4
Azerbaijan	1023	700	133	91	24,8	17,5
Belarus	149	250	14	24	1,3	2,3
Georgia	265	100	52	20	5,4	3,7
Kazakhstan	1158	950	71	58	5,2	6,0
Kyrgyzstan	109	5	24	1	6,8	0,4
Moldova	86	49	20	11	5,1	4,2
Russian Federation	2761	2600	19	18	1,0	1,4
Tajikistan	24	15	4	3	1,8	1,9
Turkmenistan	64	80	15	18	2,3	2,4
Ukraine	743	500	15	10	1,8	1,6
Uzbekistan	176	184	7	8	1,2	1,1

* Average data for: Albania, Bosnia and Hercegovina, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia, The former Yugoslav Republic of Macedonia.

** Extrapolations of January-September rates were used.

Source: Economic Survey of Europe 200. No.1. United Nations, New York and Geneva (Table 4.3.4. p.143)

GDP (in 1999) in Georgia was about 3,7 per cent what is much smaller than in neighbor countries (17,5 percent of GDP in Azerbaijan and 5,4 per cent of GDP in Armenia). Indicators of FDI in selected transition economies are presented in Table 2.

As it follows from Table 2 in last several years FDI inflow to Georgia is far from being stable. In particular in 1998, FDI increased from US\$ 236 million in 1997 to US\$ 265 million in 1998 while in the next year fell significantly (to 100 million US\$). Much of the FDI was due to the work on oil pipeline linking Sanachal in Azerbaijan and Supsa in Georgia (completed in early 1999). In 1998 investment in the oil pipeline was estimated to be around US\$ 174 million. Other major areas for FDI include energy and light industry (e.g., food, glass, and pharmaceuticals).

The largest source of FDI flows was the United States, World Bank, Great Britain, Turkey and Russia (see Table 3).

Table 3. Sources of foreign investment in Georgia (in percentage of total by year)

	1995	1996	1997	1998	1999	2000
Australia	--	--	5.0	0.4	13.3	0.7
USA	1.2	1.2	16.1	32.7	30.7	19.5
UK	58.2	3.8	18.9	13.0	12.5	0.03
Germany	--	25.9	6.1	4.3	0.8	0.6
Turkey	0.3	9.8	5.4	6.6	5.7	28.3
Japan	--	--	--	--	--	3.0
Canada	--	--	--	--	--	17.3
Russia	5.2	0.8	0.7	0.8	0.1	10.1
Greece	--	0.9	3.8	6.5	6.2	--
France	--	--	1.3	4.6	4.2	1.1
Switzerland	12.1	22.1	11.9	0.4	--	0.1
China	--	--	--	--	--	1.9
EBRD	--	16.5	--	2.9	--	1.2
World Bank	22.9	9.3	2.5	11.3	0.9	15.9

Source: Investment Opportunities in Georgia 2001, Ministry of State Property Management of Georgia (p.11)

When one examines the countries of origin of foreign direct investment, very different patterns are revealed. In Table 3 it can be seen that the share of total FDI accounted for by UK, for example, has dropped dramatically: in 1995 British's share was over 58 per cent but the share for the 2000s was only about 0.03 per cent. The opposite general pattern has characterized FDI inflow from USA (1.2 per cent of total in 1995 and

19.5 per cent of total in 2000), and from the Russian Federation (5.2 per cent in 1995, less than 1 per cent in 1996–1999 and 10.1 per cent in 2000).

3. FDI Environment in Georgia

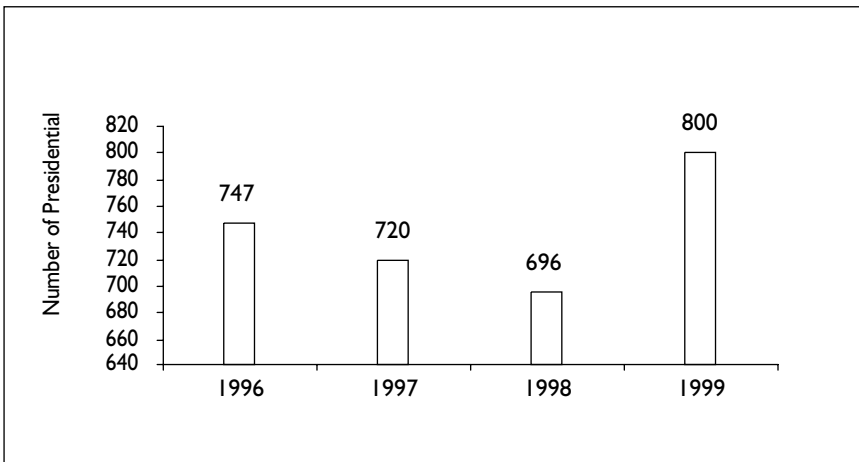
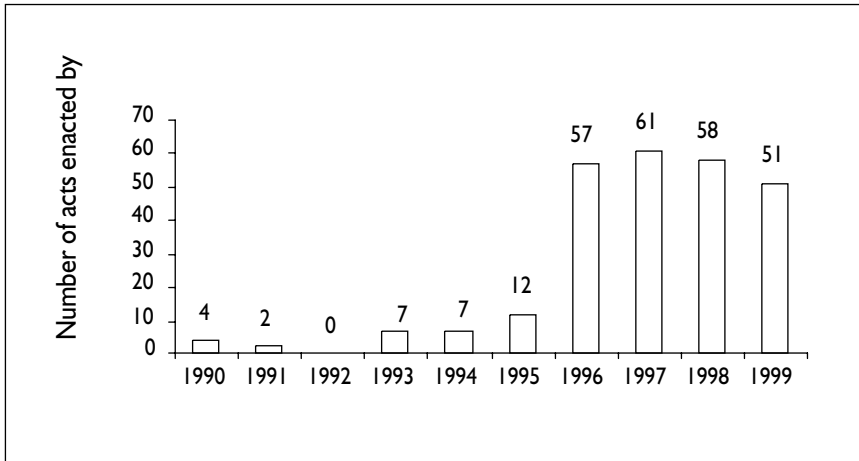
3.1. Development of the Legislative Framework

During last decade Georgia was in the permanent process of the development of new legislative framework, and it has to be acknowledged that significant progress in establishing the rule of law (i.e., the application of the due process of law, without regards to the circumstances or individuals involved) has been achieved. Since 1995, laws enacted by parliament (Figure 1.a) have increasingly displaced Presidential decrees as the main vehicle of creation of legal environment (the number of Presidential decrees still remain numerous (Figure 1.b), however, they are mainly used to instruct the executive to take specified administrative actions rather than legislative actions).

In 1997, important legislative codes were approved for (i) a tax system, (ii) a custom system, (iii) a civil code. During 1998–1999, the parliament passed Criminal Procedure Code, Administrative Code (1998), Criminal Code, and Forest Code (1999). It has to be acknowledged, however, that almost all of legal acts specified above have been periodically amended (e.g., only in 1998 the tax code was amended in January, May, June, and November).

Certain progress has been made in adopting legislation that regulates a market economy and gives basis for foreign economic activity in Georgia. In particular, the "Law on Entrepreneurs" defines the basic framework for entrepreneurship in Georgia; the "Law on General Courts" provides a basis for comprehensive judicial reform of the court system; the "Law on Bankruptcy Proceedings" regulates bankruptcy proceedings held in Georgia and rules of recognitions of bankruptcy proceedings held abroad; the "Law on declaration of private ownership of nonagricultural land in use of physical and private legal persons" permits sales of privately owned land; the "Law on administration and disposition of state owned nonagricultural land" regulates the procedure of privatization and leasing of state land; the "Law on Securities Market" creates a legal basis for securities market in Georgia; the "Law on Accounting and Reporting" determines new accounting standards consistent with internationally established principles; the "Law on State Property Privatization" determines legal, organizational and social principles, as well as, the basic terms of privatization of state property in Georgia; the "Law on Legal Status of Foreigners" regulates the main principles of the legal status of foreigners in Georgia, including the rights to work, and regulations concerning property and personal non-property rights.

Figure 1. Number of new laws and codes approved by Parliament (a) and Presidential decrees (b)



Notes: a – in 1999 only until September.

The current Georgian investment law ("Law of Georgia on the Investment Activity Promotion and Guarantees") guarantees that foreign investor's rights shall not be less than the rights and guarantees enjoyed by Georgian natural and legal person. The law defines registration requirements (in particular, license requirements for the following activities: manufacture and sale of weapons and explosives; preparation and sale of medicines and

substances that are subject to special control; use of forest resources and entrails; setting up of casinos and other gambling houses which provide for arranging games and lotteries; banking activity; insurance activity; issue of securities for public circulation; wireless communication service and TV and radio channels' creation; and "other activities defined by the effective Georgian legislation") and procedures. Furthermore, it states explicitly rights of foreign investors to convert the profit (income) gained from investments at the market rate of exchange in Georgian banking institutions and rights to unlimited repatriation abroad. Licensing with the National Bank of Georgia is not required for repatriation of interest payments on loans and profits from foreign investments; transfer from Georgia, upon termination of investment activities, of hard currency previously invested in Georgia; payments abroad for imported goods, services, works etc.

It has to be stressed, however, that new regulations are far from being perfect, and most of new laws has already undergone a number of amendments, and future reforms of the legal environment are in progress. Moreover, enforcement of legislation is hampered by ambiguity in many of the legal texts. Legal problems take a number of forms including: imprecise definition of terms in laws; imprecise drafting of laws which makes two or more interpretations possible; contradictory drafting in different laws; technical errors, and subsidiary implementing regulations not consistent with governing law. All of the above creates uncertainty of present legal environment in Georgia and definitely do not support business activity in the country.

A weak rule of law is an important obstacle to FDI in Georgia. Investors often discover debts not known at the time of due diligence and courts are often of little assistance in resolving these kind of problems. In several cases, a court decisions have lead to changes of control of enterprises. For example, a court decision reversed the privatization to foreign investors of *Chateau Zegaani Winery*, and the investors have been unable to reverse decision or obtain compensation. Moreover, other investors face continuous interference by the judiciary in areas usually regarded as a commercial prerogative, e.g., orders to reinstate workers fired for corrupt practices.

To summarize, investment regulations and enforcement of new laws are often problematic, and the overall impact of ongoing judicial reforms on private investors is not yet markedly positive.

3.2. Macroeconomic Conditions

In the aftermath of the breakdown of the Soviet Union, internal armed conflict and the war in Abkhazia, during the first years of independence Georgia experienced significant economic crisis. In 1992–1993 GDP reduced almost by 70 per cent. The

economy shifted to the shadow sector. The government unable to collect taxes had to get external debt resulting in significant foreign outstanding arrears. In the same time huge monetary emissions caused hyperinflation (percentage change in end-year consumer prices amounted about 7488 per cent in 1993 and 6474 per cent in 1994).

In 1994 government initiated the process of intensive system transformation based on, in general terms, a transition to a market economy and involved economic liberalization accompanied by the privatization of the state-owned sector. In 1995 national currency – lari (GEL) was introduced and a number of reforms were implemented to stabilize and liberalize the Georgian economy. Subsequent macroeconomic reforms aimed at strengthening the budget, enforcing national currency stability, reducing inflation rate and ensuring economic growth.

In the following years significant progress has been achieved in establishing relative macroeconomic stability (see Table 4). Inflation has sharply fallen and reached the level of 4.5 per cent in 2000. After a massive output decline, real GDP started to increase, showed solid growth in 1996 and 1997 (11.2 percent and 10.7 percent, respectively), stabilized at the level of about 3 percent in 1998 and 1999, and decreased to 1.9 per cent in 2000. Deficit of the state budget decreased from 6.6 per cent of GDP in 1996 to 4.5 per cent of GDP in 1999 (3.7 percent of GDP in 1998) and 3.5 percent in 2000. However, as presented in Table 4, most of basic macroeconomic indicators experience significant fluctuations.

Georgia has adopted a managed floating exchange rate regime, which has risen confidence in the lari. The National Bank of Georgia strategy has been to intervene in the foreign exchange market if necessary to prevent a depreciation of lari.

Table 4. Basic macroeconomic indicators

	1996	1997	1998	1999	2000
Nominal GDP (million lari)	3768.0	4504.7	4794.6	5593.8	5955.1
Real GDP growth (% Y to Y)	11.2	10.7	2.9	3.0	1.8
Inflation (CPI)	41.6	7.0	3.5	19.3	4.1
Budget deficit (% GDP)	6.6	5.9	3.7	4.5	3.5
International reserves (USD billion-end of period)	190.2	200.3	123.6	132.9	112.9
Export (USD billion)	309.9	376.5	299.9	329.6	459.4
Import (USD billion)	897.5	1162.8	994.5	863.4	965.5
Trade balance (USD billion)	-587.5	-786.3	-694.6	-533.8	-506.1
Balance of payments (USD billion)	-569.5	-513.8	-275.6	-195.1	-262.4
Exchange rate (period average)	1.2621	1.2975	1.3915	2.0194	1.98

Reforms of tax legislation, and as a result, improvement of the tax base played a substantial role in realization of tax and fiscal program. However, notwithstanding the rate of improvement in budgetary revenue collection, there are still serious difficulties. The main reasons for budget revenues shortfall are: The shadow economy, tax evasion, low level of registration, as well as the poor financial conditions of enterprises and organizations. To summarize: fiscal difficulties continue from year to year.

Deficit financing in Georgia is carried out mainly through loans from the National Bank of Georgia (by direct borrowing) and loans from abroad (mainly from international organizations). Persistent relatively large budget deficits and problems with their financing as well as obligations of debt service give impetus for exchange rate fluctuations and increases the probability of exchange rate crisis.

The labor market in Georgia is relatively free and open. Minimum wage is binding for both private and public sector employees. Wage negotiations take place between employees and employers. Trade unions are not politically powerful (the major reason for this is that they represent workers in formal economy, and hence exclude the sizable number of workers in the informal economy (estimated in 1997 at 750000). Some local and small scale strikes have taken place among teachers, pensioners, and workers in the energy and transport sectors due to lack of payment of wages. The unemployment rate (based on LFS definition) which was at 17.6 in 1999 decreased to about 15.2 percent in 2000 (Table 5). It is likely that under-employment and hidden employment remain widespread.

Real wages in the formal sector after some increase in 1997 and 1998 contracted reflecting impact of higher inflation at the end of 1998. Despite the gains made earlier years, monthly wages remain very low at about US\$ 30 (as in 1999).

Table 5. Labor market indicators

	1996	1997	1998	1999	2000
Nominal average wages (lari)	29.0	42.5	55.4	63.4	76.5
Unemployment rate (LFS-end of period)	16.8	8.8	13.7	17.6	15.9

To summarize. Since mid-1994, the Georgian authorities has been implementing stabilization and structural reform program, however, observed persistence of relatively large budget deficits, problems with their financing, and vulnerable exchange reserves position, suggests that macroeconomic environment in Georgia still cannot be considered as stable.

4. FDI in Unstable Economic Environment

In this section we present a simple formal model describing the process of decision making concerning FDI in unstable macroeconomic and legal environment. The purpose of the model is to show the impact of business uncertainty on the decisions of foreign firms concerning direct investment in the country. Therefore, in order to focus directly on the problem we do not include explicitly to the model a number of issues related to underdeveloped infrastructure and banking system, bureaucracy or widespread corruption, which are undoubtedly taken into account in the process of FDI decision making.

4.1. The Model

Consider a single commodity market in a given country. For the sake of simplicity assume that this particular commodity is not produced in this country, but demand is satisfied by import. Suppose that the unit price of this commodity is determined in the world market and equals P_{world} (assume also that world price is determined in US dollars). Market demand for this commodity in the country under study is described by inverse demand function $P(x)$, where x denotes the volume of the commodity supplied to the market ($x \geq 0$), $P(x)$ is a market price in national currency (we suppose that inverse demand function is continuous and twice differentiable, so that $dP(x)/dx < 0$, $d^2P(x)/dx^2 \geq 0$).

Suppose, now, that there exists a foreign company, which considers the possibility to produce the commodity under consideration inside the country. To make a decision the company has to analyze profitability of the investment. In particular, if there is no uncertainty in the market, the decision makers have to compare discounted stream of future profits yield by the investment with the cost of the investment in the present (both future profits and the investment cost in the present have to be expressed in foreign currency, e.g., in US dollars). Furthermore, assume that if the production process is already established, marginal production cost does not depend on the volume of output (i.e., is constant), and the cost function is specified as $C(x) = cx + F$, where c denotes constant marginal cost, F stands for fixed costs. For simplicity suppose that all costs are expressed in national currency and do not depend on the exchange rate (i.e., assume, that only local resources are used in the production process).

Since the commodity can be imported at the world price, then if the production of the commodity is established inside the country, the company can sell the volume

produced at market price not exceeding eP_{world} , where e denotes exchange rate of the foreign currency (US dollar) in the country considered (expressed as a number of units of local currency for one unit of foreign currency). Furthermore, suppose that price of import (in terms of local currency) eP_{world} restrict the possibility to fully exploit the monopoly power on the domestic market which the company could have (i.e., $c < eP_{world} < P_m$, where P_m denotes monopolistic price in local currency), and consequently, that investing company will not be able to earn monopolistic profit (see Fig. 1).

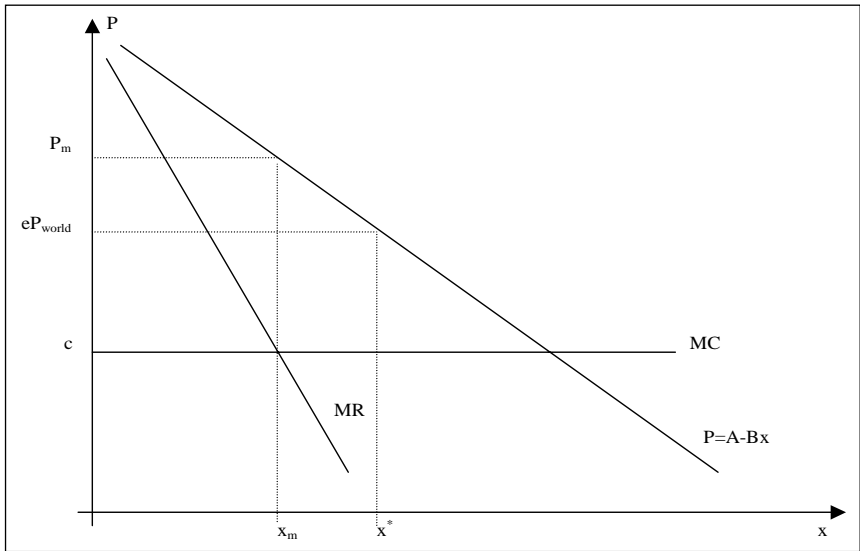
Consequently, in fully deterministic case in each particular period (for example, a year) profit of the company is determined as $\pi(x) = ePx - cx - F$, where x is the volume of output produced and supplied to the market, P – is the market price in local currency of the unit of commodity ($P \leq eP_{world}$).

Obviously, in order to determine firm's profit in subsequent periods (knowing demand curve and price of commodity unit in the world market) one has to know estimations of exchange rate and production cost. It has to be stressed, however, that both exchange rate and cost of production, in general, depend on a number of macroeconomic indicators and contemporary legal regulations. In particular, exchange rate can be influenced by the value of budget deficit, level of foreign reserves, balance of payments deficit, inflation, etc. Tax code and other judicial regulations determine a number of items included in the calculation of the cost of production, such as for example:

- costs incurred in the start-up and implementation of production;
- costs incurred in connection with the production process (materials, tooling, current maintenance etc.);
- costs for environmental protection measures;
- expenses associated with the management of the production process (e.g. mandatory audits, certification of products and business trips (within the limits stipulated by law));
- expenses for salaries and wages;
- expenses for training and retraining of employees;
- expenses for mandatory social security and pension payments and for voluntary social benefits provided to employees (e.g. cafeterias, transportation services);
- depreciation of fixed and intangible assets;
- costs incurred in marketing and selling products;
- payments for banking services.

Usually, values of macroeconomic indicators (or data required for the estimation of these indicators) are determined based on official forecasts of Ministry of Finance, National Statistical Committee, National Bank, predictions of investment banks and organizations involved into economic research, and own intuition of analysts and decision

Figure. I. General characteristics of the domestic market



Notes: P_m , x_m – monopolistic price and output, respectively; eP_{world} world price expressed in local currency (maximum possible price for domestically produced commodity unit); x^* – optimal output; MC – marginal cost; MR – marginal revenue.

makers. An important issue is that, typically, all these forecasts differ from each other (often significantly). Moreover, legal framework in most of transition economies is not stable as well. Therefore, the decision concerning FDI is made in uncertain environment (i.e., based on the number of predictions and forecasts). In the present model, we assume that in each subsequent period the firm faces only exchange rate uncertainty (resulted from unstable macroeconomic environment), and uncertainty about marginal cost of production (resulted from unstable legislation). Since for each forecast there exists certain probability that it will be a true value, exchange rate and marginal cost of production are considered as random variables, described by certain probability distribution (known at the moment of decision making).

In the simplest case, each period firm's expectations concerning exchange rate and marginal cost of production are specified in the form of two probability distributions:

- (1) exchange rate probability distribution,
 - (2) marginal cost probability distribution,
- (in general, these distribution can change from period to period).

For simplicity assume, that both random variables under consideration (exchange

rate and marginal cost) are independent, and in each of the distributions only two outcomes are possible, i.e., that each random variable with certain probability can take higher value and with certain probability – lower value. In particular, assume that

- probability that the exchange rate of the national currency versus foreign currency (US dollar) will be low (i.e., exchange rate will be equal to \underline{e}) equals r ($0 < r < 1$), and probability that the exchange rate of the national currency versus foreign currency (US dollar) will be high (i.e., exchange rate will be equal to \bar{e}) equals $(1-r)$;
- probability that marginal cost of production will be low (equal to \underline{c}) equals q ($0 < q < 1$), and probability that marginal cost of production will be high (equal to \bar{c}) equals $(1-q)$.

Consequently, in each period of time the following four different outcomes are possible:

- (1) Low exchange rate and high marginal cost of production (probability: $r(1-q)$),
- (2) Low exchange rate and low marginal cost of production (probability: $r q$),
- (3) High exchange rate and high marginal cost of production (probability: $(1-r)(1-q)$),
- (4) High exchange rate and low marginal cost of production (probability: $(1-r) q$).

In each of the possible outcomes profit of the firm specified in units of national currency is determined as

$$\begin{aligned}\pi_1(x) &= \underline{e}Px - \bar{c}x - F \\ \pi_2(x) &= \underline{e}Px - \underline{c}x - F \\ \pi_3(x) &= \bar{e}Px - \bar{c}x - F \\ \pi_4(x) &= \bar{e}Px - \underline{c}x - F.\end{aligned}$$

Moreover, assume that firms are managed according to the wishes of their owners who are typical asset holders, and the decisions in each firm are made by a group of decision-makers with sufficiently similar preferences to guarantee the existence of a group-preference function, representable by a von Neuman-Morgenstern utility function⁶. Given these conditions we assume risk aversion, so that utility function of each firm (U) is strictly concave⁷. To simplify the analysis assume that the exact shape of the utility function U is specified as follows:

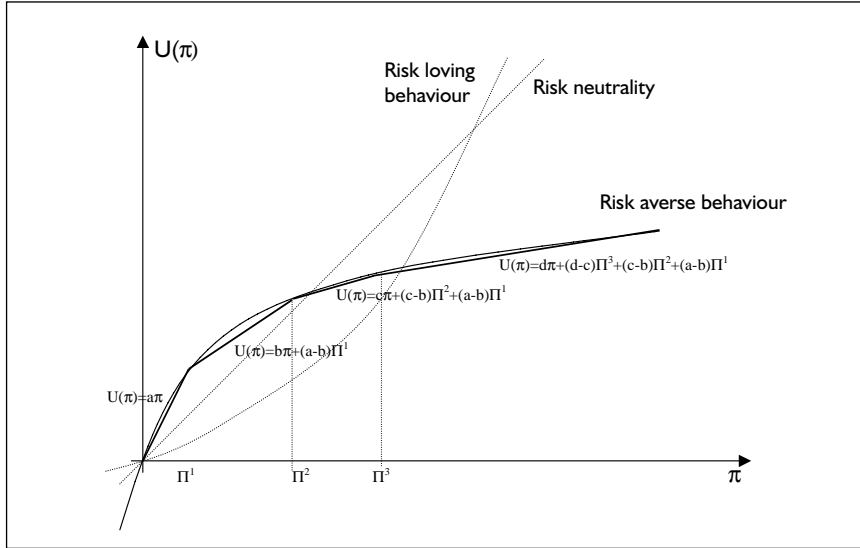
$$U(\pi) = \begin{cases} a\pi, & \text{if } \pi < \Pi^1 \\ b\pi + (a-b)\Pi^1, & \text{if } \Pi^1 < \pi < \Pi^2 \\ c\pi + (b-c)\Pi^2 + (a-b)\Pi^1, & \text{if } \Pi^2 < \pi < \Pi^3 \\ d\pi + (c-d)\Pi^3 + (b-c)\Pi^2 + (a-b)\Pi^1, & \text{if } \Pi^3 < \pi \end{cases}$$

⁶ See Sandmo (1971) for discussion.

⁷ Sandmo (1971) and Leland (1972) provide detailed justifications for this assumption.

where $a > b > c > d > 0$, and the volume of output produced is such that $\pi_1 < \Pi^1 < \pi_2 < \Pi^2 < \pi_3 < \Pi^3 < \pi_4$ (see Figure 2). To simplify notation we denote: $b_0 = (a-b)\Pi^1$, $c_0 = (b-c)\Pi^2 + (a-b)\Pi^1$, and $d_0 = (c-d)\Pi^3 + (b-c)\Pi^2 + (a-b)\Pi^1$.

Figure 2. Formal description of the firm's attitude towards risk (risk averse utility function is represented using piecewise linear approximation)



Making decisions about the volume of output risk averse firm does not maximize profit, but instead it maximizes expected utility from profit (because lower profit with lower risk could be sometimes better for a firm than higher profit with higher risk). Therefore, making investment decisions the company has to compare discounted stream of expected utility from future profits from the investment (expressed in foreign currency) with the cost of the investment (expressed in foreign currency) at present. Formally, the firm analyses the value specified by the expression:

$$\max_{x_1, x_2, \dots, x_T \geq 0} \left\{ \frac{1}{I} \sum_{t=1}^{T \leq \infty} \beta^t E[U(\pi_t(x_t) / e_t)] \right\},$$

where: I – the cost of the investment in foreign currency at the present,

E – expectation operator,

β – discounting coefficient ($\beta \in (0, 1)$),

T – time horizon of the investment.

4.2. Analysis of the Model and Basic Results

In order to make a decision concerning location of the investment the firm has to estimate the value specified by the expression above and compare it with certain target value. If the value computed exceeds a target value then the firm makes decision about the investment in this location. Taking into account that discounting factor is an exogenous variable specific for each company, and time horizon and investment cost are specific for each particular investment, the value of discounted stream of expected utility from future profits yielded by the investment (expressed in foreign currency) depends only upon the value of expected utility from profit in each particular period of time. It is clear that the expected utility from profit in each particular period⁸

$$E[U(\pi e)] \equiv r(1-q)U(\pi_1 / e) + rqU(\pi_2 / e) + \\ + (1-r)(1-q)U(\pi_3 / \bar{e}) + (1-r)qU(\pi_4 / \bar{e})$$

increases if

- expected value of the exchange rate increases (local currency becomes cheaper)⁹,
- expected value of marginal cost of production decreases.

It is not obvious, however, how the expected utility from profit in each particular period depends (or if it depends at all) on the variability (i.e., on the variance or standard deviation) of the exchange rate and marginal cost of production. In Appendix, we present a formal proofs of the following propositions:

PROPOSITION 1. *In each particular period of time the expected utility from profit is inversely related to the variability of marginal production cost.*

PROPOSITION 2. *In each particular period of time the expected utility from profit is inversely related to the exchange rate variability.*

Propositions presented above describe the relationship between the expected utility from profit and the variance (or variability) of the exchange rate and marginal production cost. Since higher values of the expected utility from profit in each period of time makes the positive investment decision more likely the following conclusion can be made based on the propositions above:

Economic stability (reduction of the variability of forecasted variables) stimulate the inflow of foreign direct investment to the country¹⁰, and vice versa, economic instability reduces inflow of foreign direct investment to the country.

⁸ In order to simplify notation we skip subscript t .

⁹ Assuming that the exchange rate does not affect the cost of production.

¹⁰ Since it increases the value of the discounted stream of the expected utility from profit.

It has to be mentioned that in the simple model presented above we focused only on two possible probability distributions. However, it has to be taken into account that probability distribution of the exchange rate depends upon a number of macroeconomic variables (including forecasted variables), such as inflation, expected budget deficit, trade deficit, balance of payments deficit, etc. Similarly, probability distribution of marginal production cost depends upon expected distribution of tax burden, social payments, level of wage, corruption etc. Consequently, economic instability and increase in variability of each of forecasted factor leads, *ceteris paribus*, to the reduction of FDI inflow.

On the other hand, it is also necessary to take into account other factors that increase value of expected utility from profit, and consequently, affect the results of FDI decision making, such as:

- size of the market (increase in market size can be achieved by reduction of trade barriers, and participation in regional trade/custom unions),
- infrastructure (improvement in infrastructure may reduce production, transportation or communication costs),
- FDI legal framework (increase in transparency and reduction of the possibility of different understanding of legal regulations can reduce corruption, and consequently, cost of the investment as a whole),
- time requirements and complexity of bureaucratic procedures (extensive bureaucratic procedures lead to ineffective utilization of financial resources, and therefore, corresponding changes may decrease the cost of investment).

Another important issue is related to the problem of attracting investors, which are focused not on risky buying/selling operations, but, instead, on stable long term investments. As it has been argued in the model, in reality (and in advanced economic theory) firms are characterized by risk aversion. However, not all the firms are identical, some of them are less and the other are more risk averse. Taking into account that the value of the discounted stream of the expected utility from future profits depends on the attitude of the firm towards risk the following proposition can be proven (see Appendix for the formal proof):

PROPOSITION 3. *Under uncertainty the value of the expected utility from profit in each particular period is inversely related to the degree of risk aversion of the decision making firm.*

Consequently, it may happen that the value of the discounted stream of the expected utility from future profits could be too little for serious long-term investors (characterized by high risk aversion), but it could be satisfactory for less risk averse firms (or risk loving firms), which are more interested in speculative transactions than in long term investment. Finally, it can be concluded that:

Unstable economic situation may result in adverse selection of investors, i.e., it may happen that only firms interested in short run speculative transactions are ready to invest in the country.

Obviously, such an investment is not demanded by any country aiming to attract FDI.

5. International Experience in Reforming FDI Regime

According to the old paradigm of FDI seen over the world until end of sixties, there are essentially two motivations for foreign direct investment: access to some inputs for production (natural resource deposits, low-cost labor, etc.), and access to markets for outputs. The attraction of inputs continues to be important to this day although the importance of low-cost labor is decreasing. Countries that were strong in one or both of these attractions received a lot of FDI (e.g., Brazil during 1950s and 1960s). In contrary, countries without large and growing markets, or without natural resources or very cheap labor, were not important for FDI. Input-seeking FDI greatly increased trade and in fact was dependent upon it. Market-seeking FDI was a substitute for trade and in many cases dependent on trade restrictions. Moreover, most FDI in those days was "greenfield" investment, i.e., embodied in the construction of new factories.

In contrary to market-seeking and resource-seeking FDI, the last decade has seen the rise of a new kind of FDI called "globalizing" FDI (40–60% of total FDI during nineties). A significant part of it has not been connected with greenfield activities but instead with mergers and acquisitions. The dominant motivating force behind mergers and acquisition activity has been to rationalize and strengthen the competitive edge of the investing company by giving it facilities for global or regional strategies of creating interdependent production, administration, research and development, accounting, design, etc. Although mergers and acquisition are usually accompanied by some increase in physical capacity, the driving force is the search for worldwide efficiency and competitive advantage. The general trend is that countries try to create favorable conditions for foreign investors with bilateral agreements and regional trade packs. Only in 1997 more than 150 amendments were made in the investment codes of 76 countries, 86 per cent of which were positive for the investment climate, while only 16 per cent were negative. Many measures were aimed at opening up previously closed sectors like telecommunication, television and radio broadcasting, and energy. Other measures included simplifying licensing procedures and authorizing more special economic zones. The best example of the host countries for such kind of FDI is Brazil where only in one month in 1998 FDI amounted to 10 billion

USD. If former communist countries are concerned, Hungary is one of the world leaders in attracting FDI without natural resources or very cheap labor (it is estimated that about 50% of FDI inflow to transition countries of Central Europe was related to "globalizing" FDI). Another example is Mexico, which very successful FDI liberalization reform is shortly characterized below¹¹.

Mexico new regulations issued in 1989 liberalized FDI establishment in several ways, and were complemented by liberalization of regulatory practice (which was very important although informal). Formally, majority Mexican equity was no longer required, except in a few sectors (banking, oil, electricity) if the proposed investment met certain criteria. In practice virtually, every normal investment was deemed to met these criteria, and permission was given automatically and quickly (exceptions were undesirable activities such as toxic waste dumps, casinos gambling, weapons assembly, nuclear technology etc.). The regulations also simplified the registration procedures for foreign investors, and removed or simplified restrictions and red tape that had previously been involved in government approval of various aspects of technology transfers. Overall, the change in Mexico's attitude toward FDI went far beyond the change in regulations. It switched from suspicion and regulation, to promotion and facilitation. All of this together with some recovery in domestic demand increased FDI in 1989 to the amount of about 3 billion USD. However, in 1990 it fell by 10%. The response of Mexico to this was NAFTA, the free trade agreement with the US and Canada approved in 1994 and further formal liberalization of FDI (in particular, it reduced any uncertainty that investors might have about the future of FDI in the country). The results of such policy is presented in Table 5.

As the example of active measures to improve investment climate in former Soviet Union countries we can consider FDI liberalization in Russia and Kazakhstan.

Since the beginning of nineties the Russian government has been undertaking active measures to improve its investment climate. In particular, currently it is actively reducing taxes in order to stimulate growth of private income and development of domestic market. Proposed tax reforms should reduce taxes by 2 per cent of GDP. A flat 13 per cent income tax has been proposed that should increase transparency of company finances. Social fund payments will be reduced from 38.5 per cent to 36 per cent. To make up lost revenue, the package of measures includes reducing the number of tax deductions and exemptions (for private scientific organizations, housing construction, and personal charitable donations) and increasing excise taxes on petrol, cigarettes and alcohol. It has to be emphasized, however, that the reforms may have negative effects (increased petrol taxes may harm the competitiveness of some businesses).

¹¹ Based on Bergsman, Broadman, Drebebtsov (2000).

Table 5. FDI inflow to Mexico and policy changes

Year	FDI inflow (billion USD)	Share (%) of globalizing FDI	Policy change
1989	3.0	30	New FDI regulations – elimination of 51% of Mexican majority in most sectors
1990	2.6	40	Privatization of telephones, mining, steel, tourism, airlines
1991	4.8	50	NAFTA negotiation begin
1992	4.4	60	Privatization of banks, financial system reforms
1993	4.4	60	Imminent NAFTA approval, new FDI law codifying the 1989 regulations, more privatization
1993	11.0	70	NAFTA approval, relaxed FDI restrictions
1995	9.5	80	Economic crisis, deregulation in gas electricity
1996	7.6	90	Banking system opening FDI
1997	12.1	90	Long distance telephone, communications deregulations

Source: Bank of Mexico.

In Kazakhstan, the law "On State Support to Foreign Investments" provides the following privileges and preferences: state grants for in-kind assistance; 100% reduction the basic tax rate on income, land and property for up to the first five years and 50% for next five years; full or partial relief from customs duty for imported equipment, materials and raw materials used in the business. The degree of privileges and preferences is based on the amount of investment, sector and expected payback period. The law guarantees the right to: sell or transfer ownership, property, income and profit; open bank accounts and convert funds into hard currency; take advantage of special incentives in the customs regulations; receive protection of investments, profits, dividends, and legal rights, and noninterference of state bodies and officials in the company's management. In priority sectors of the economy Kazakhstan's State Committee on Foreign Investments determines the amount, nature and duration of the privileges and preferences based on their evaluation of the criteria, which may include the following: land tax, property tax, income tax, customs duties, and state grants for in-kind assistance. Income taxes may be reduced when, after other incentives are taken into account, an investment still does not provide an adequate rate of return. Temporary exemption or reductions in property taxes are granted for building new industrial capacity or investment in agriculture.

Exemptions or reduced tax rates are also available when a significant investment in new capital involves losses in initial years. Depending on the type of investment activity and its economic prospects, investors may be able to assume possession of existing production facilities free of charge together with their intangible assets, inventories and other properties. Investors are offered partial or full exemption from import duties on modern capital equipment, raw materials and components necessary for project implementation. Imported equipment, components and raw materials are fully exempt from import duties when used in newly built facilities engaged in production for export. The exemptions are granted based on two criteria: (i) the investment's pertinence to economy priorities; and (ii) the total investment does not exceed 10 million USD. The schedule of tax privileges used by the State Committee on Investment depends directly on the amount of investment and differs somewhat from privileges base on economic priorities.

It has to be stressed however that all these privileges and preferences do not help much to attract FDI if economic, political and legal situation is not stable.

Finally, we should mention that the empirical evidence from other foreign countries which shows that inflow of FDI is largely a consequence of previous economic growth. The People's Republic of China and Vietnam are examples of countries that have succeeded in attracting substantial amounts of FDI because they have maintained rapid rates of growth during their transitions. Crucial factors in achieving rapid growth have been domestic savings and investment. Gross domestic investment was 40 per cent of GDP in China in 1999, for example, but the savings rate was even higher, namely, 42 per cent of GDP. At the same time, official development assistance was a miniscule 0.3 per cent of GDP and external debt was only 15 per cent of GDP.

6. Conclusions and Policy Recommendations

It should be acknowledged that Georgia has been recently constantly and explicitly trying to attract FDI and hence make the FDI regime more attractive. However, a relatively small amount of accumulated FDI suggests that the government has not been very successful. Of course, the lack of political and economic stability has been an important stumbling block and even an excellent policy towards FDI would not suffice to outweigh that. The general political situation has also not been considered as stable. The democratic process has withstood several potential threats, including two assassination attempts against President Shevardnadze (September 1995 and January 1998). The Abkhazia region (and to lesser extend Ossetia) continues to contest Georgian sovereignty while the autonomous region

Ajara periodically challenges central authority. Moreover, the regional situation remains tense with Russian military activity in both Chechnya and Dagestan.

The other, and one of the most damaging elements is the tax system, in which instability, a heavy burden, and arbitrary enforcement are major deterrent to foreign investors. Moreover, there need to be stepped up efforts in dealing with crime, corruption, lack of security of property and persons, and enforcements of contracts. Even when appropriate legislation exists, the courts are unable to enforce procedures and outcomes. It is important to strengthen the legal/judicial framework to allow for credible property rights and adequate contract enforcement. It has to be acknowledged that Georgia (as many other CIS country) has paid increasing attention to the problem of corruption (there is ongoing debate on this issue). We have also to stress that there is no single solution to this problem, but recent insights suggests that corruption arises when institutions have monopoly positions, there is the ability to exercise discretion and incentives for accountability are weak. Therefore, additional laws are unlikely to bring about significant reduction in corruption, but instead effective reform must be directed to changing the system in the following directions (see Bergsman, Broadman and Drebentsov, 2000): (i) introduction of independent oversight of agencies; (ii) clarifying and making transparent how much official discretion can be exercised; and (iii) utilizing penalties and rewards for conduct.

To summarize, to be on the top of the list of countries for extended FDI and multinational production Georgian authorities have to take into account the following list of factors driving FDI inflow:

- political and economic stability (to reduce investment risk and provide reasonable predictability for making business decisions);
- government behavior that facilitates doing business, rather than harassing it;
- an FDI legal framework in line with the best international practice (with security of property and of persons and enforceability of contracts);
- an enabling environment for domestic market growth, including adequately developed infrastructure and human capital;
- the availability of all these conditions to all companies automatically and by law (without a need for a special treatment and discretionary decisions by officials or civil servants).

The most serious challenge Georgia faces at the moment is to switch from an obsolete approach towards attracting foreign investment to modern one. The former (old one), in case of Georgia, involves relatively high tariff protection of domestic market, and on top of that, specific privileges offered to FDI. The latter approach would require getting rid of both sticks and carrots, and providing foreign investors with a stable business environment and generic climate conducive for attracting capital.

Appendix

Proof of Proposition 1. Consider discrete probability distribution of random marginal production cost, such that only two outcomes are possible:

- low marginal cost (equal to \underline{c}) with probability q ($0 < q < 1$)
- high marginal cost (equal to \bar{c}) with probability $1-q$.

Expected value of the marginal cost equals $q\underline{c} + (1-q)\bar{c}$. Taking into account that utility function can be represented using its piecewise linear approximation (see Section 4.1) the expected utility from profit can be specified as

$$E[U(\pi/e)] \equiv \frac{r}{e} \left[(1-q)a(ePx - \bar{c}x - F) + qb(ePx - cx - F) + qb_0 \right] + \frac{1-r}{e} \left[(1-q)c(\bar{e}Px - \bar{c}x - F) + (1-q)c_0 + qd(\bar{e}Px - \underline{c}x - F) + qd_0 \right].$$

Assume now that standard deviation of marginal cost increases, but expected value of marginal cost remains constant, i.e., that if \bar{c} increases by $\bar{\xi}$, \underline{c} decreases by

$$\underline{\xi} = \frac{1-q}{q} \bar{\xi}$$

In this case, the expected utility from profit (denoted by superscript *) is represented as

$$E[U(\pi/e)^*] \equiv \frac{r}{e} \left\{ (1-q)a[ePx - (\bar{c} + \bar{\xi})x - F] + qb \left[ePx - \left(\underline{c} - \frac{1-q}{q} \bar{\xi} \right) x - F \right] + qb_0 \right\} + \frac{1-r}{e} \left\{ (1-q)c[\bar{e}Px - (\bar{c} + \bar{\xi})x - F] + (1-q)c_0 + qd \left[\bar{e}Px - \left(\underline{c} - \frac{1-q}{q} \bar{\xi} \right) x - F \right] + qd_0 \right\}.$$

Denote

$$M \equiv \frac{1}{e} \left[(1-q)a(ePx - \bar{c}x - F) + qb(ePx - cx - F) + qb_0 \right],$$

$$M^* \equiv \frac{1}{e} \left\{ (1-q)a[\bar{e}Px - (\bar{c} + \bar{\xi})x - F] + qb \left[ePx - \left(\underline{c} - \frac{1-q}{q} \bar{\xi} \right) x - F \right] + qb_0 \right\}$$

and

$$N \equiv \frac{1}{e} \left[(1-q)c(\bar{e}Px - \bar{c}x - F) + (1-q)c_0 + qb(\bar{e}Px - cx - F) + qd_0 \right],$$

$$N^* \equiv \frac{1}{e} \left\{ (1-q)c[\bar{e}Px - (\bar{c} + \bar{\xi})x - F] + (1-q)c_0 + qd \left[\bar{e}Px - \left(\underline{c} - \frac{1-q}{q} \bar{\xi} \right) x - F \right] + qd_0 \right\}.$$

It is straightforward from the expressions above that for any particular volume of output x : $M > M^*$, if $a > b$ and $N > N^*$, if $c > d$. Taking into account inequalities above and the fact that linear combination (with positive coefficients) of M and N is always greater than analogous linear combination of M^* and N^* , we can conclude that the expected utility from profit with bigger standard deviation of marginal cost $E[U(\pi/e)]^*$ is always smaller than the expected utility from profit with smaller standard deviation of marginal cost $E[U(\pi/e)]$, and, consequently, that the expected utility from profit is inversely related to the variability of marginal production cost (note that the result derived does not depend on the period of time, i.e., it is valid for any period of time).

Proof of Proposition 2. Consider discrete probability distribution of the exchange rate, such that only two outcomes are possible:

- low exchange rate (equal to \underline{e}) with probability r ($0 < r < 1$)
- high exchange rate (equal to \bar{e}) with probability $1-r$.

Expected value of the exchange rate equals $r\underline{e} + (1-r)\bar{e}$. Taking into account that utility function can be represented using its piecewise linear approximation (see Section 4.1.) the expected utility from profit can be specified as

$$E[U(\pi/e)] \equiv (1-q) \left[ra \left(Px - \frac{\bar{c}x + F}{\underline{e}} \right) + (1-r)c \left(Px - \frac{\bar{c}x + F}{\bar{e}} \right) + (1-r)c_0 \right] + q \left[rb \left(Px - \frac{cx + F}{\underline{e}} \right) + rb_0 + (1-r)d \left(Px - \frac{cx + F}{\bar{e}} \right) + (1-r)d_0 \right].$$

Assume now that standard deviation of the exchange rate increases, but its expected value remains constant, i.e., that if \bar{e} increases by $\bar{\xi}$, \underline{e} decreases by

$$\underline{\xi} = \frac{1-q}{q} \bar{\xi}.$$

In this case, the expected utility from profit (denoted by superscript $*$) can be represented as

$$E[U(\pi/e)] \equiv (1-q) \left[ra \left(Px - \frac{\bar{c}x + F}{\underline{e} - \bar{\xi}(1-r)/r} \right) + (1-r)c \left(Px - \frac{\bar{c}x + F}{\bar{e} + \bar{\xi}} \right) + (1-r)c_0 \right] + q \left[rb \left(Px - \frac{cx + F}{\underline{e} - \bar{\xi}(1-r)/r} \right) + rb_0 + (1-r)d \left(Px - \frac{cx + F}{\bar{e} + \bar{\xi}} \right) + (1-r)d_0 \right].$$

Denote

$$S \equiv ra\left(Px - \frac{\bar{c}x + F}{e}\right) + (1-r)c\left(Px - \frac{\bar{c}x + F}{e}\right) + (1-r)c_0 ,$$

$$S^* \equiv ra\left(Px - \frac{\bar{c}x + F}{e - \bar{\xi}(1-r)/r}\right) + (1-r)c\left(Px - \frac{\bar{c}x + F}{e + \bar{\xi}}\right) + (1-r)c_0$$

and

$$T \equiv rb\left(Px - \frac{cx + F}{e}\right) + rb_0 + (1-r)d\left(Px - \frac{cx + F}{e}\right) + (1-r)d_0 ,$$

$$T^* \equiv rb\left(Px - \frac{cx + F}{e - \bar{\xi}(1-r)/r}\right) + rb_0 + (1-r)d\left(Px - \frac{cx + F}{e + \bar{\xi}}\right) + (1-r)d_0 .$$

It is straightforward from the expressions above that $S > S^*$, if

$$\frac{(e + \bar{\xi})e}{[e - \bar{\xi}(1-r)/r]e} > \frac{c}{a} .$$

Since the right hand side of the inequality above is always smaller than one, and its left hand side is always greater than one, the inequality above is always satisfied. Similarly, one can show that $T > T^*$.

Taking into account that $S > S^*$ and $T > T^*$, and the fact that linear combination (with positive coefficients) of S and T is always greater than analogous linear combination of S^* and T^* , we can conclude that the expected utility from profit with bigger standard deviation of the exchange rate $E[U(\pi/e)]^*$ is always smaller than the expected utility from profit with smaller standard deviation of the exchange rate $E[U(\pi/e)]$, and, consequently, that the expected utility from profit is inversely related to the exchange rate variability (note that the result derived does not depend on the period of time, i.e., it is valid for any period of time).

Proof of Proposition 3. Consider discrete probability distribution of random marginal production cost, such that only two outcomes are possible:

- low marginal cost (equal to \underline{c}) with probability q ($0 < q < 1$)
- high marginal cost (equal to \bar{c}) with probability $1-q$.

Assume that utility function can be represented using its piecewise linear approximation (see Section 4.1). Furthermore, suppose that there are two potential firms-investors having different attitude towards risk:

- (1) long-term investor with strong risk aversion,

(2) short-run speculative investor almost neutral towards risk (i.e., with relatively small risk aversion).

Denote coefficients of the piecewise linear approximation of the utility functions of these two investors with the help of subscripts 1 and 2, respectively. It is clear that for two investors with the attitude towards risk described above the following is true:

$$a_1 \leq b_2, \quad b_1 \leq b_2, \quad c_1 \leq c_2, \quad d_1 \leq d_2,$$

$$b_{1,0} \leq b_{2,0}, \quad c_{1,0} \leq c_{2,0}, \quad d_{1,0} \leq d_{2,0},$$

and at least one, out of seven inequalities presented above, is strong. Consequently, the utility function of the investor 2 is less concave than the utility function of investor 1 (this corresponds to smaller risk aversion of the investor 2).

The expected utility form profit of investor 1, is specified as

$$E_1[U(\pi/e)] \equiv \frac{r}{e} \left[(1-q)a_1(ePx - \bar{c}x - F) + qb_1(ePx - cx - F) + qb_{1,0} \right] +$$

$$+ \frac{1-r}{e} \left[(1-q)c_1(\bar{e}Px - \bar{c}x - F) + (1-q)c_{1,0} + qd_1(\bar{e}Px - cx - F) + qd_{1,0} \right],$$

while the expected utility form profit of investor 2 can be represented as

$$E_2[U(\pi/e)] \equiv \frac{r}{e} \left[(1-q)a_2(ePx - \bar{c}x - F) + qb_2(ePx - cx - F) + qb_{2,0} \right] +$$

$$+ \frac{1-r}{e} \left[(1-q)c_2(\bar{e}Px - \bar{c}x - F) + (1-q)c_{2,0} + qd_2(\bar{e}Px - cx - F) + qd_{2,0} \right].$$

It is straightforward (assuming that the shapes of the utility functions are as described above) that $E_2[U(\pi/e)] < E_1[U(\pi/e)]$, and, consequently, that the expected utility from profit is inversely related to risk aversion of the investor (note that the result derived does not depend on the period of time, i.e., its is valid for any period of time).

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