FOREIGN BANK ENTRY IN CIS COUNTRIES

by

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Abstract

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The intent of this paper is to find which factors were crucial for foreign banks when they decided to enter markets of Commonwealth of Independent States. It was shown that economic reforms, wealth of the country, political risks and financial sector size were the main determinants which attracted foreign banks. Moreover, it was found that economic reforms enhanced financial sector efficiency in post-soviet countries.

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GLOSSARY

CIS – Commonwealth of Independent States

CEE - Central and Eastern European Countries

BIS – Bank for International Settlements

EBRD – European Bank for Reconstruction and Development

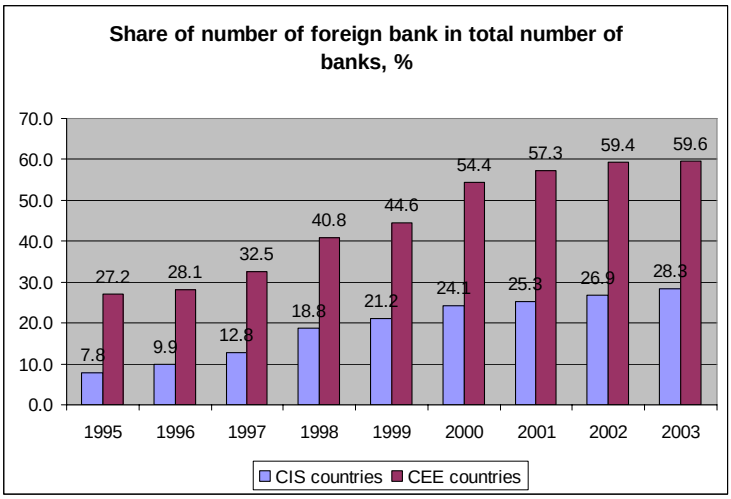
Chapter 1

INTRODUCTION

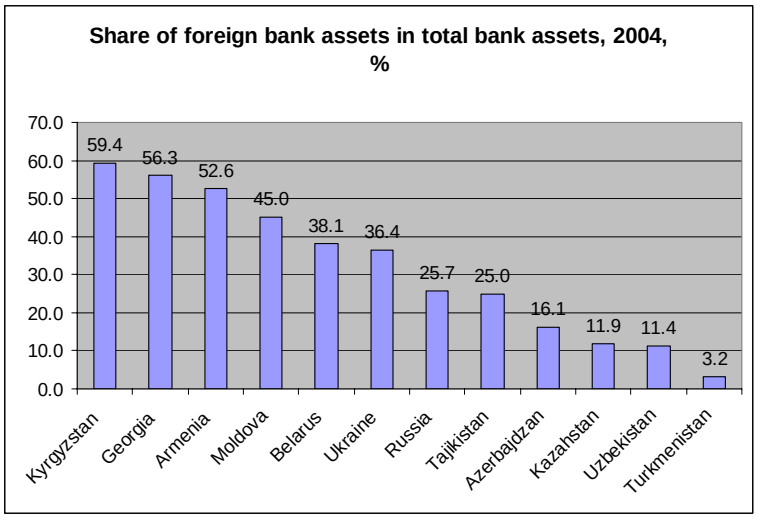
The financial systems of transition countries have changed dramatically over past decade. The growing presence of foreign-owned financial institutions during the 1990s is one of the most vivid structural changes.

After the fall of the communist regimes, Eastern Europe needed capital to restructure its real economy. In particular, state-owned enterprises had incentives to modernize to survive in competitive markets. Additionally, Eastern European economies felt shortage in small firms to provide basic consumer goods and services, and entrepreneurs from the very beginning lacked access to start-up capital. But the Eastern European banking sector initially seemed inadequately small to satisfy this demand for funds.

Unsatisfactory results of early domestic privatization schemes forced governments to rely on foreign resources to recapitalize their banking sectors, because largest banks suffered large losses. So, large-scale entry of foreign banks was a conscious decision made mostly not by banks and their owners but by governments who agreed to open their financial markets (Kraft, 2004). In other cases, the perceived benefits of a better capitalized banking system and fiscal constraints led the Central and Eastern European countries to privatize most of their banks in the late 1990s and permit foreign ownership. Currently, more than half of the banks in CEE are foreign-owned. In some countries the share of foreign banks assets relative to total assets of the banking system is more than 75% (Naaborg and etc, 2003). And if we look at graph, the share of foreign banks relative to total banks in CEE and CIS countries has tendency to rise during 1995-2002.



The same tendency was observed with foreign bank assets and by 2004 the average share of foreign bank assets in total bank assets in CIS countries achieved 24%. The leaders in foreign bank assets became Kyrgyzstan (59, 4%), Georgia (56,3%) and Armenia (52,6%).



The transformation of socialist banking systems in CIS countries was bound to be difficult. While ordinary soviet enterprises could still continue to produce their goods, the services of socialist banks were of little use in market economy. These institutions "were primarily bookkeepers for the planned

allocation of resources" and provided only monetary accounts for resource flows (Fries, Taci (2002)).

In the beginning of transformation, banking systems in the CIS countries were developed mainly through liberal entry of new banks in combination of breakup and privatization of state banks, and in some cases liquidation of old banks. The result was an explosion of the number of new banks that entered the system. Some of the banks were engaged mostly into financing existing inefficient enterprises. Many of them were small and undercapitalized, didn't have proper governance and didn't mobilize many deposits. Therefore, although many new banks were established, financial intermediation in these economies did not increase. By this reason, governments were able to respond to banking crises by closing the insolvent institutions without generating widespread effects on the economy.

So, the initial condition unique to the CIS and other transition economies was the lack of experience on the part of both enterprises and banks in operating under market conditions (Tang, et al, 2000). That is why, the entry of foreign banks appeared to have been a useful approach for strengthening the domestic banking sector (Bonin et al, 1999). An econometric study done by Claessens et al, (1998) found that foreign entry increased competition in the banking sector in 80 countries for the period 1988-1995 which is essential for improving the efficiency of financial intermediation.

So, the entry of multinational experienced banks may help these countries to build sound and modern financial system that is needed for economic development.

Nonetheless, the practice of several transition economies has shown that even after opening financial markets these countries were not flooded by foreign banks in first years (Svyatnenko (2005)). This can be explained by the fact that investors were very cautious about the situation in the countries and figured carefully all the pros and cons of their expansion. That is why the main issue

became to investigate the factors that are crucial for the location decisions of foreign banks. This problem is fundamental for the CIS countries that want to be members of WTO and should open their financial markets for international banks.

Most studies analyzed entry of foreign banks to developed economies and thus did not consider the distinctive framework concerning the process of transition. There are just a few studies that focus on transition economies where they only consider one country or a small group of countries though the CIS countries are not investigated at all. Another common limitation is that many studies used relatively dated time series and did not contain analysis of the changed financial market conditions after the Asian crisis.

This research intends to fill the niche of foreign bank entry to CIS countries and will allow discovering the main factors that the governments of CIS countries should pay attention to in order to make their economies attractive for foreign banks. Moreover, the research will test whether economic reforms attracted foreign banks to enter and whether these reforms influenced efficiency of a banking sector.

For my research I take 12 Commonwealth of Independent States: Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmen, Uzbekistan, and Ukraine. The sample period is 1994-2004 taking into account the fact that annual data for all explanatory variables for the CIS countries is available starting from 1994. To find determinants of foreign bank entry particularly to CIS countries I will test explanatory variables that are commonly agreed in the literature on bank entry and in addition include indicators of banking and enterprise reform as well as political risk.

The structure of the paper is following: in the beginning I look through existing literature on foreign bank entry then I describe the model and

methodology I will be using after this I stop on describing my data and estimation results and in the end there is a conclusion.

Chapter 2

LITERATURE REVIEW

The epoch of multinational banking started in the 1830s when British banks began to open their branches in their colonies. So the "first wave" of multinational banking accompanied and even facilitated the rise of colonialism in the nineteen century (Attiat, F. (2003)). The decades of war and depression ended this "first wave". In the 1970s local banks (primarily USA banks) launch their expansion into foreign markets following their multinational clients (USA companies). This was the "second wave" of financial institutions' international expansion, which began in the 1960s and concentrated in developed countries. "Third wave" is dated mid nineties when banks have started their operations in a large number of emerging markets, while others have renewed their foreign operations after the debt crisis of the 1980s.

Although multinational banking is not a new phenomenon the majority of researchers agreed that international banks is the least understood aspect of finance (Razanau, A. (2000)).

Strong inflow of foreign direct investment of banks during "second wave" to industrialized countries attracted the attention of researches and the mass of both empirical and theoretical studies has been accomplished in period 1970-1980. Main questions that researchers have attempted to address were the following:

1) What draws foreign banks to a country?

2) Which banks expand abroad?

3) How foreign bank presence affects economy of host country?

4) Whether foreign banks are more efficient than domestic banks?

It is obvious that the topic of multinational banking is vast, that is why in this review I will mainly focus on the papers dedicated to the determinants of foreign bank entry to a country and only briefly mention the effect of foreign

bank presence and their effectiveness comparing to domestic banks. I really think that the two latter aspects are worth to be described because they have their particular traits with regard to transition countries.

As I have already mentioned, the majority of literature deals with the "second wave" of international banking and that is why most studies analyze FDI by banks between developed economies and thus does not consider the distinctive framework of transition period and transition countries such as particular features of banking system of these countries, legal framework and several risks that do not usually prevail in developed economies. There are just a few studies that focus on transition economies where they only consider one country or a small group of countries though the CIS countries are not investigated at all. So while describing the literature on the determinants of foreign bank entry I will look at classical papers that deal mainly with developed countries and that is why establish commonly agreed determinants of foreign banks entry. Then I will switch to the recent studies mainly on emerging and transition economies which contribute new special explanatory factors and more deep understanding of foreign bank phenomena in these countries.

The relevance of my research in finding important factors that attract foreign banks to the CIS countries is proved by the outstanding effect that these banks on the economy of transition countries. The Working Group of BIS "Foreign Direct Investments in the Financial Sector" (BIS (2004)) accumulated all the investigations of researchers who previously studied foreign banks' phenomena either for developed or emerging countries. On the basis of this material they came to the understanding of the impact foreign banks made in the development of the host countries.

Firstly, foreign financial institutions may support the development of local financial markets in emerging markets. They have both experience and incentives to develop local markets especially particular segments such as funding, derivatives and securities markets in order to have more opportunities to earn

profits. They try to reduce their risk and by this reason develop hedging markets, local funding markets (interbank market) and management of interest rate, currency risk. Foreign banks as well contribute to improvements in legal practices and financial infrastructure, including accounting standards and auditing practices.

Secondly, foreign financial institutions contribute to financial stability in the host countries in the medium and long term by enhancing the capacity of the system to absorb shocks. Stronger capitalization and ability to manage risk together with access to parent or world funding and diversification of the parent's risks make foreign banks less sensitive to both home and host country business cycles. That is why lending to local clients tends to be more stable in times of stress. The reduced probability of failure for foreign banks allows the existence of banks that continue operating in a crisis. That fact increases the probability of the system as a whole remaining functioning. Moreover, foreign banks can absorb domestic capital flight within local financial market moderating capital outflow without the balance of payments effects that add to exchange rate and interest rate changes.

Thirdly, foreign banks bring transfer of ownership and managerial control that in medium and long-run can lead to ongoing transfer of know-how, the integration into the processes of the parent organization and the global market for corporate control through import of human capital on both managerial and the operational level. "Transfer" of reputation may be a guaranty for host countries that well-known foreign bank will commit to its obligations and make efforts to increase performance.

Another point that is described in recent research on transition and emerging countries is that unlisted companies in countries with underdeveloped equity markets and weak shareholder protection in many cases rely on debt and specifically on bank credit to fund investment (Giannetti M., Onega S. (2005)). Foreign banks may thus represent an invaluable source of capital for small firms and push the creation of new companies. Though Gianetti M. and Onega S.

found ambiguous effect of foreign bank entry on availability of credits for small and medium-sized enterprises (SMEs), in any case the Working Group found, that changes in lending policies by foreign-owned banks cannot be viewed in isolation when evaluating their effect on credit availability for SMEs. Even if foreign banks focus on specific market segments, increased competition in these markets appears to induce other domestic banks to channel resources to other parts of the economy while they begin to look for new creditworthy clients.

Finally, the problem of funds is even more crucial for many developing countries, where domestic banks often lend to related parties (La Porta et. al 2002). As a consequence companies owned by well-connected individuals obtain funding even if inefficient, while young and potentially highly profitable firms face credit rationing. On the other hand, foreign banks usually have less connection to local families and politicians. Therefore, foreign banks have more incentives to fund promising projects, rather than related or state-owned firms.

What concerns the efficiency of foreign banks versus domestic banks the studies on this issue contribute even more to the relevance of my research and the need for CIS governments to take actions to be more attractive to foreign banks. Clarke. et.al (2001) in their literature overview on foreign bank experience in host countries mention Berger et al. (2000) who by making comparative analysis found that in developed countries with advanced and strong banking system foreign banks are less efficient than domestic ones, though it is not the case for transition and developing countries. In addition they mention particular studies on Colombia from 1985 to 1998 (Barajas, Steiner and Salazar (2000)), Argentina in the late 1990s (Clark et al. (2001)) and India (Bhattacharya, Lovell, and Sahay (1997)) which also report that foreign banks are more productive than domestic ones.

All these findings support the suggestion of EBRD that foreign banks can contribute significantly to the banking development, particularly where confidence in domestic institutions remains low (Fries, Taci (2002)). That is why

it is necessary to distinguish factors that are crucial in location decisions of foreign banks.

The studies on determinants of foreign bank entry can be divided into theoretical articles explaining banking FDI and empirical papers which test different factors that attract or impede foreign entrants. Herrero and Simón (2003) made literature review on both theoretical and empirical articles that were written mainly on developed countries during "second wave" of international banking. I will follow their description while leaving literature on transition countries and the latest literature to be my responsibility.

Theoretical literature

Representing theoretical literature the authors distinguish microeconomic/behavioral and macroeconomic motives for banks to expand abroad. Microeconomic foundations of foreign banks to go abroad lie in the fact that all economic agents always compare costs and benefits from investing, that is why relating to foreign banks they consider expected gains that can come from (i) competitive advantage factors, (ii) efficiencies that cannot be attained operating exclusively in local markets; and (iii) geographical risk diversification.

Competitive advantage factors such as innovative products, better intermediation technologies or superior management quality are among the frequently cited (Dunning (1977) Gray and Gray (1981),Buckley and Casson (1991)). Though there was no consensus whether these factors could really be an advantage in financial sector especially banking which is highly competitive where management technologies can be easily transferred. These debates were relevant for highly developed economies and can not be justified by the experience from emerging and transition countries where the heritage of communist regime and the dominance of state-owned banks has resulted in the low competition in banking sector.

Another competitive advantage factor is information. Usually firms prefer to deal with reduced number of banks in order to limit the circle of people knowing their financial and business information as small as possible (Nigh, Cho and Krishnan (1986) ,Casson (1990)). That is why the bank chosen to service particular firm has competitive advantage in serving this firm in foreign markets. This implies very famous "follow the customer" motive when banks go abroad to these countries where their customers invest in order to provide them with relevant services and do not allow foreign banks to share the profits (Brimmer and Dahl (1975), Gray and Gray (1981), Ball and Tschoegl (1982)).

By the same reason there can appear a "defensive reaction" motive when foreign bank goes abroad to prevent the company to switch to the foreign bank even in its home countries which will lead to the lost of the market share in domestic market Grubel (1977).

Common origin can also be mentioned as competitive advantage factor due to the fact that common history and language can reduce the costs from operating abroad (Swoboda (1990), Guillén and Tschoegl (1999)). This motive is especially important for banks which go to transition countries where long years of communist regime resulted in significantly different business mentality. More over long dominance of state-owned banks lead to the less efficient banking system. To support this statement I refer to the article of Focarelli and Pozzolo (2000) where they found that foreign banks are more attracted with the countries with less efficient banking sector.

Efficiency factor is usually represented in the literature by the size of a bank, its degree of internalization and distribution channels. Large size allows banks to translate their efficiency of scale on international market and compete with local banks even taking into consideration high entry costs (Terrell (1979), Tschoegl (1983), and Sabi (1988)). The degree of internalization is also important because big network of customers can reduce transaction costs (Ursacki and Vertinsky (1992)).

Finally, Herrero, A. and Simón, D. (2003) mention risk diversification as one of the most important motive because banks can diversify their incomes among foreign countries (Aggarwal and Durnford (1989), and Berger and de Young (2001)). What concerns transition countries characterized by high riskiness foreign bank entrance can be explained by the fact that banks prefer to enter relatively riskier countries but with promising deposit base (Repullo (2000)).

What concerns macroeconomic motives for banks to expand abroad, Herrero, A. and Simón, D. (2003) tell that there is a lack of research in this area. But this is mostly explained by the fact that for "second wave" of international bank expansion these factors were not crucial because they invested in developed economies with strong economies and established financial markets. The existing literature deals with imperfect capital markets and exchange rate movements. Imperfect capital markets allow international credit to be more available to foreign banks than to local (Goldberg and Saunders (1981), Klein, Peek and Rosengren (2000)). This factor is very significant for transition and mainly to CIS countries where the price of credit is higher than the average price in the world and this fact lead foreign banks to be in a better position than domestic one. Local currency depreciation increases the wealth of foreign participants who can compete and win profitable projects from local competitors that is why exchange rate movements can also explain foreign bank entry. Most authors looked at the relation between bilateral trade and financial FDI, or FDI and financial FDI. It was found that both bilateral trade and non-bank FDI are relevant factors explaining financial FDI (Goldberg and Johnson (1990) for US bank, Yamori (1998) Japan, Buch (2000) for Germany banks, Focarelli and Pozzolo (2001) for all OECD countries). Though if we refer to the existing literature on transition and emerging markets there will be find a problem of causality. In emerging markets economies, non-financial FDI may have been limited by the lack of adequate financial services in the host countries. Thus, foreign bank entry may be a pre-requisite for non-financial FDI and not a consequence. Moreover, Miller

and Parkhe (1998) find that greater FDI to a host country is associated with foreign bank entry, except for developing countries. So "follow the customer" hypothesis might have more limited applicability than previously speculated. In my research I test whether FDI and trade are important for foreign bank entry in CIS countries.

Particularly for transition countries there was found that foreign-owned banks do not necessarily have an informational advantage in assessing the credit-worthiness of local lending opportunities relative to domestic banks (Fries, Taci (2002)). This may be particularly true for lending to small and medium-sized enterprises, which are a key source of economic growth in transition economies.

There is a broad consensus that common origin as comparative advantage plays significant role in expanding abroad. Colonial links and language explain why some banks go to one group of countries but not in others (Galindo, Micco and Serra (2003)). This tendency is even more evident on the experience of transition countries which have common soviet experience and remained production links that is why in CIS countries foreign banks are represented by the banks from CIS and Baltic countries. Razanau (2002) in his study on foreign bank entry in Belarus and Ukraine found distance to be significant for both countries.

It should be mentioned, that there is also growing consensus about the importance of economies of scale as efficiencies factor to expand abroad. Most studies find that bank **size** is significant in determining a bank's decision to invest abroad [Grosse and Golberg (1991), Ursacki and Vertinsky (1992), Williams (1996, 1998), Berger et al. (1999)). This evidence is reinforced by numerous studies showing that the size of the host country and the size of its financial system are also relevant (Grosse and Golberg (1991)). In my research I use constructed variables that are proxies for country and its financial sector size to test whether they were important for foreign bank entry.

The risk sharing hypothesis is supported by a number of studies. Buch and DeLong (2001) show that geographical distance is a key determinant of financial FDI for most G7 countries, except the US.

Empirical literature

The lack of macroeconomic theories on financial FDI explains the shortage of empirical studies in this area especially for developed countries, though there are a growing number of articles dedicated to emerging and transition markets.

The host country's (expected) economic growth is found to be a driving force of international banking (Focarelli and Pozzolo (2001)). Another related variable is the development of the financial system in the host country. The same authors show that foreign banks prefer to operate in countries with a relatively developed and not too concentrated financial system. Macroeconomic volatility**,** in turn, appears to hamper financial FDI (Grosse and Goldberg (1991), Fisher and Molyneux (1996) and Yamori (1998)). Others pull factors are specific of investment in industrial countries, such as ensuring a stable deposit base [Walter and Gray (1983)].By this reason I included margin (lending minus deposit rate) and inflation as explanatory variables for foreign bank entry in CIS countries.

There are also a number of institutional factors which appear to determine financial FDI. A very relevant one is the existence of domestic restrictions limiting banks' operations (Buch and DeLong (2001)) and openness of the host country to the establishment of new foreign branches and subsidiaries **(**Nigh, Cho and Krishnan (1986), Goldberg and Johnson (1990), Golberg and Grosse (1994), Sagari (1992), Barth et al. (2001), and Milher and Parkhe (1998)). In my research I included 4 EBRD indicators that represent institutional changes and economic reforms in CIS countries.

High per capita income in the host country, used as a proxy for profit opportunities, fosters financial FDI (Brealey and Kaplanis (1996), Yamori (1998) and Buch (2000)). In the same vein Claessens et al. (2000) show, for a large number of countries, that banks are attracted to markets with high profitability

and income per capita, as well as low taxes. Based on the survey among banks, Kraft (2004) concludes that high interest margins were the strongest reason for foreign bank entry in Croatia at the moment of entry. Mathienson and Rodols (2001) in their study on 15 emerging countries, including the Czech Republic, Hungary and Poland showed that the rate of return on equity, non-performing loans and banking crises are taken into account by foreign banks to enter these countries. Wesel, (2004) in his study of German banks to invest in emerging markets proposed to include the indicator of early prediction of banking crises (M2/Reserves) and found it to be highly significant especially for data series after Asian crises.

A number of studies on transition economies found that the level of economic reforms and political freedom, the protection of creditor rights and the quality of bankruptcy procedures affect foreign bank entry a lot, that is why they included such explanatory variables as country and political risk (Clarke et al.2001, Fries,Taci (2002), Wesel, (2004), Lensik, Haan (2004)). I also include political risk indicator as explanatory variable for foreign bank entry in CIS countries.

As a conclusion of the literature review on foreign bank entry I want to notice that looking at studies on transition literature practically all authors point the idea that this topic should be further studied in order to understand this "third wave" of international banking to transition countries with the focus on investigating macroeconomic and risk factors.

Chapter 3

MODEL AND METHODOLOGY

My regression will look in the following way:

$$FBANK_{i,t} = \alpha_{i,t} + \sum_{j=1}^{J} \beta_j REFORM_{j,i,t} + \sum_{k=1}^{K} \gamma_k FINSIZE_{k,i,t} + \sum_{l=1}^{L} \delta_l EFFECT_{l.i.t} + \sum_{m=1}^{M} \ell_m WEALTH_{m,i,t}$$

$$+ \sum_{n=1}^{N} \eta_n INVEST_{n,i,t} + \varpi_{i,t} POLITICS_{i,t} + \varepsilon_{i,t}$$

FBANK – foreign bank entry indicator - a dependent variable which shows foreign bank presence in a country and is proxied by:

1. Ratio of number of foreign banks to all banks
2. Ratio of foreign banks assets to total banks assets

On the basis of both indicators I will construct an overall indicator for foreign bank entry based on principal component analysis.

REFORM- comprises the vector of up to j variables that represent economic reforms in a country

1. Level of banking/enterprise sector reform (3 EBRD indicators)
2. Share of the private sector relative to the public sector

On the basis of these indicators I will construct an overall indicator for economic reform based on factor analysis.

FINSIZE - comprises the vector of up to k variables that represent the attractiveness of a country to foreign banks and is a financial sector size indicator

1. Private credit by deposit money banks divided by GDP
2. Deposit money bank assets divided by GDP
3. Deposit money bank assets divided by the sum of central bank assets and deposit money bank assets
4. M2 divided by GDP

On the basis of these indicators I will construct an overall indicator for financial sector size based on factor analysis

EFFECT - comprises the vector of up to *l* variables that represent financial sector efficiency of a particular CIS country.

1. Margin (lending minus deposit rate)
2. Rate of inflation

On the basis of these indicators I will construct an overall indicator for efficiency of financial sector based on factor analysis

WEALTH - comprises the vector of up to *m* variables that represent wealth of a particular CIS country

1. GDP per capita of host country
2. The size of population
3. Tariff revenues divided by imports.
4. Trade divided by GDP

On the basis of these indicators I will construct an overall indicator for wealth based on factor analysis

INVEST - comprises the vector of up to *n* variables that represent investment climate of a particular CIS country

1. Foreign direct investments divided by GDP
2. Private domestic investments to GDP.

On the basis of these indicators I will construct an overall indicator for investment climate based on factor analysis

POLITICS- political risk indicator of a particular CIS country.

In order to estimate the model I use panel data which has various advantages and Baltagi (2005) lists the following:

1) Panel data can be used to deal with heterogeneity in the micro units, allowing controlling for omitted variables that are persistent over time. In our case, country-specific variables affect foreign bank entry and not accounting for this country heterogeneity causes serious misspecification.

2) Panel data contains more information, more variability and that is why smoothes multicollinearity problem. In addition, it brings more degrees of freedom and more efficiency.
3) Panel data better deal with dynamics adjustment and that is why more attractive comparing with cross-sectional data that looks relatively stable hide a multitude of changes.
4) Panel data identify and measure effects that are simply not detectable in pure cross-section and time-series data.

Though there exist limitations on its use, such as unbalancedness and difficulties in its collection, modern econometrics techniques allow the use of unbalanced data and give tools to fight with heteroskedasticity.

Doing estimation on panel data I need to decide whether fixed effects, random effect or simple OLS should be used and F-test and Breusch-Pagan test will help me to identify it. Moreover Hausman test will discriminate between fixed or random effects.

In order to construct new variables on the basis of all available data I will use both factor analysis and principal factor analysis.

Factor analysis represents a complex array of structure-analyzing procedures used to identify the interrelationships among a large set of observed variables and then, through data reduction, to group a smaller set of these variables into dimensions or factors that have common characteristics (Nunnally, Bernstein, 1994). Factor analysis can be used for theory and instrument development and assessing construct validity of an established instrument when administred to a specific population (Nunnally, Bernstein, 1994).

Factor analysis can be used when the researcher does not know how many factors are nessesary to explain the interrelationships among a set of characteristics, indicators or items, though in principal factor analysis the number of factors is fixed from the start.

My primarily sources of description of factor and principal component analysis comes from the Hardle and Simar (2003) and Chartfield and Collins (1980) where they give the techniques of undertaking the analysis.

The main objective of principal components analysis (PC) is to reduce the dimension of the observations without losing too much information. In result, we have smaller number of variables which explain most of the variation in the original variables. The simplest way of dimension reduction is to take just one element of the observed vector and to discard all others. But Hardle and Simar (2003) argue that it is not a very reasonable approach, since strength may be lost in interpreting the data. An alternative method is to weight all variables equally, i.e., to consider the simple average of all the elements in the vector. This again is undesirable, since all of the elements are considered with equal importance (weight). A more flexible approach is to study a weighted average

$$\delta^T X = \sum_{j=1}^{p} \delta_j X_j \text{ so that } \quad \sum_{j=1}^{p} \delta_j^2 = 1 \tag{1}$$

which is called a standardized linear combination (SLC)

The first principal component Y_1 is obtained by taking such δ_1 that X_1 has the largest variance.

$$\max_{\{\delta:\|\delta\|=1\}} Var(\delta^T X) = \max_{\{\delta:\|\delta\|=1\}} \delta^T Var(X)\delta = \delta^T \sum \delta$$

(2)

The second principal component is found in such a way that Y_2 has the largest possible variance but is not correlated with Y_1.

So in order to find first principal component we maximise our objective function (2) subject to $\delta_1^T \delta_1 = 1$ or

$$L(\delta_1) = \delta_1^T \sum \delta_1 - \lambda(\delta_1^T \delta_1 - 1)$$

$$\frac{\partial L}{\partial \delta_1} = 2\sum \delta_1 - 2\lambda\delta_1$$

Setting it equal to zero, we have

$$(\sum - \lambda I)\delta_1 = 0$$

A non-zero solution exists if and only if λ is an eigenvalue of $\sum$ which has n eigenvalues that are nonnegative as $\sum$ is positive semidefinite. So we have $\lambda_1 \rangle \lambda_2 \rangle ... \rangle \lambda_n \geq 0$.

To find first principal component

$$Var(\delta_1^T X) = \delta_1^T \sum \delta_1 = \delta_1^T \lambda I \delta_1 = \lambda \qquad (3)$$

To maximize the variance we should choose λ to be the highest and that is why it will be λ_1. So our δ_1 using equation (3) will be eigenvector of $\sum$ corresponding to the largest eigenvalue.

The second principal component is obtained in the same fashion though we have one more additional constraint that Y_2 should be uncorrelated with Y_1 or

$$Cov(Y_2, Y_1) = Cov(\delta_2^T X, \delta_1^T X) = E[\delta_2^T (X - \mu)(X - \mu)^T \delta_1] = \delta_2^T \sum \delta_1$$

4)

So the additional constraint is $\delta_2^T \sum \delta_1 = 0$ and taking into account that $\sum \delta_1 = \lambda_1 \delta_1$ we have that it must be equal to $\delta_2^T \delta_1 = 0.$ We now have the following objective function

$$L(\delta_2) = \delta_2^T \sum \delta_2 - \lambda(\delta_2^T \delta_2 - 1) - \beta \delta_2^T \delta_1$$

$$\frac{\partial L}{\partial \delta_2} = 2(\sum - \lambda I)\delta_2 - \beta \delta_1 = 0 \qquad (5)$$

If we multiply this equation by δ_1^T and since $\delta_2^T \delta_1 = 0.$ we obtain

$$2\delta_1^T \sum \delta_2 - \beta = 0$$

but as covariance from (4) equals to zero , so our $\beta = 0$ and from (5)

$$(\sum - \lambda I)\delta_2 = 0$$

This time we choose λ to be the second largest eigenvalue of $\sum$ with δ_2 to be the corresponding eigenvector. Preceding in the same way the jth principal component is associated with the jth largest eigenvalue.

Let present the results in matrices:

1) matrix of eigenvectors $(n \times n)$ $\delta = [\delta_1, ... \delta_n]$

2) vector of principal components $(n \times 1)$ Y= $A^T X$

3) covariance matrix of Y $(n \times n)$

$$\Lambda = \begin{matrix} \lambda_1 & 0 & .. & 0 \\ 0 & \lambda_2 & .. & 0 \\ .. & .. & & \\ 0 & .. & .. & \lambda_n \end{matrix}$$

as Var(Y)= $A^T \sum A$ that is why $\Lambda = A^T \sum A$ and $\sum = A \Lambda A^T$

Eigenvalues can be interpreted as the respective variances of different principal components. The sum of these variances is given by

$$\sum_{i=1}^{n} Var(Y_i) = \sum_{i=1}^{n} \lambda_i = trace(\Lambda) = trace(A^T \sum A) = trace(\sum AA^T) =$$

$$= trace(\sum) = \sum_{i=1}^{n} Var(X_i)$$

So the sums of the variances of the original variables and of their principal components are the same.

The main feature of principal component analysis is that it is very sensitive to the scale of measurement. The solution to this problem will be in standardization of original variables. The covariance of the standardized variables $X_1^*, X_2^*, ..., X_n^*$ is the correlation matrix of the original variables for which all diagonal terms equal 1. That is why the sum of the diagonal terms (the sum of the variances of the standardized variables) will be equal to n. As the sum of eigenvalues of

correlation matrix will also be equal to n, so that the proportion of the total variation by the jth component is λ_j / n.

D A T A

My set of countries includes all countries of Commonwealth of Independent States: Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmen, Uzbekistan, and Ukraine. The data refer to 1994-2004 period. Since the years for which data are available differ per country, the estimates will be done on unbalanced data.

The appendix 1 provides details on definition of all variables and my data sources that come mainly from EBRD Transition Reports and International Financial Statistics. In Appendix 2 summary statistics for all variables can be found. Appendix 3 contains a matrix of correlation between all variables I consider. The matrix identifies high degree of correlation between variables which can lead to multicollinearity problem that I plan to eliminate by using factor analysis which combines a set of variables into variable(s) that best reflect(s) the original data using all information available in the indicators.

I considered two dependent variables (foreign assets to total banking (**fas_tasset**) and number of foreign banks to total number of banks (**fbank_tbank**)) in logarithm to avoid possible heterogeneity problems and tried to construct an overall indicator for foreign bank entry with the use of principal factor analysis. As both foreign bank indicators exist for 1999-2004, I constructed common foreign bank indicator only for these years. Principal factor analysis suggests that there is no one dominant factor (the proportion of the total variance explained by one component factor equals only 0.54). So, while testing my model I will be looking at both variables.

If we look at a table and compare these two indicators of foreign bank presence for CIS countries in 2004 we will find that they tell different story about foreign banks presence and assign different ratings to countries. For example, if we take share of number of foreign banks in total banks then Belarus will be the leader in foreign bank presence. This explained by the fact that the country can have a lot

of small foreign banks and they do not play very high role in the country though significant foreign asset share shows foreign bank expansion in the country. Nonetheless, both factors represent foreign bank presence and should be used for comparison. Moreover, indicator of foreign bank assets to total banks assets of the country available only starting from 1999 till 2004 in contrast to indicator of number of foreign banks to total number of banks that I have for the entire period 1994-2004, so I will have more observations for my investigation while doing my regressions for the whole period.

Table 1: Foreign bank presence indicators

Country	Assets of foreign banks (%) 2004	Country	Number of foreign banks (%) 2004
Kyrgyzstan	70	Belarus	59.4
Georgia	58	Moldova	56.3
Armenia	57	Kyrgyzstan	52.6
Moldova	34	Armenia	45.0
Belarus	20	Georgia	38.1
Ukraine	12	Turkmenistan	36.4
Russia	11	Kazakhstan	25.7
Tajikistan	6	Tajikistan	25.0
Azerbaijan	5.8	Uzbekistan	16.1
Kazakhstan	6	Ukraine	11.9
Uzbekistan	4.4	Azerbaijan	11.4
Turkmenistan	2	Russia	3.2

Source: EBRD Transition Report, 2005.

The number of my explanatory variables is pretty big (17) which can lately cause the problem of shortage of degrees of freedom and most of them are highly correlated with each other (Appendix 3). I can also refer to the technique of factor analysis to find major explanatory variables in condensed form by using all available data

In my dataset I have 4 indicators of economic reforms:

ebrdbankr

Reforms in the banking sector and interest rate liberalization are represented by the appropriate EBRD indicator. The lowest score (1) indicates little progress beyond establishment of the two-tier system. The highest value (4) implies full convergence of banking laws and regulations with BIS standards such as provision of a full set of competitive banking service.

ebrdtrader

The transition of trade and foreign exchange system is another EBRD indicator. The lowest score (1) indicates wide import and/or export controls or very limited legimate access to foreign exchange. The highest value (4) is given when the standards and norms of industrial countries are in place like removal of most tariff barriers and membership of WTO.

ebrdinterpr

The extent of transition within enterprises in EBRD indicator takes the lowest score (1) when there are soft budget constraints and few other reforms to promote corporate governance. The highest score (4) is received when the standards and performance are typical of advanced industrial economies.

privat_gdp

The extent to which the economy has changed from public to private, measured by the share of private sector relative to the public sector.

These indicators are highly correlated because represent from different sides the level of economic reforms in a country, so with the use of factor analysis we can construct one or two indicator.

I applied factor analysis to examine whether the correlation between four indicators can be explained in terms of unobservable factor. The factor analysis suggests that the four indicators can be decomposed into one economic reform factor (REFORM). The factor loadings of the factor are given in table 4. Banks are usually attracted by positive changes in economic policies of countries that is

why I expect positive impact of economic reform indicator on foreign bank presence.

Table 2. Factor loadings for REFORM

Variable	REFORM	Uniqueness
ebrdbankr	0.84220	0.25653
ebrdtrader	0.79786	0.32527
ebrdinterpr	0.90054	0.15042
privat_gdp	0.93179	0.11091

In my econometric analysis I also control for variables that are mentioned in the literature and traditionally are important for foreign bank entry such as financial sector size and its efficiency. My dataset includes six indicators that measure different aspects of financial sector size development. These variables are: private credit by deposit money banks over GDP (**credit_gdp**); deposit money ank assets over GDP (**depasset_gdp**); deposit money bank assets over the sum of central bank assets and deposit money bank assets (**depas_totas**); broad money to GDP (**m2_gdp**); interest rate margin (**margin**: lending minus deposit rate); and the rate of inflation (**inflation**). Some of these variables are also highly correlated and I used factor analysis to find whether they have common underlying factors. The result was that my 6 variables can be decomposed into two factors. A closer look to factor loadings shows that first factor has mostly to do with financial sector size (FINSIZE) as credit_gdp, depasset_gdp, depas_totas, m2_gdp are mostly important while second factor reflect financial sector efficiency (EFFECT) as margin and inflation contribute the largest part. I expect that the smaller the financial sector of the country the more it attractive for foreign banks to enter the country. It should be noted that as margin and inflation decreases effectiveness of the financial sector increases. In early stages of transition countries suffered from high inflation and unstable policies and high banking margins reflected all the risks. Time passed and stable, competitive economies have now moderate margins. So the lower this factor the higher rate

of banking presence is expected as higher margins reflect inefficiences in banking sector.

Table 3.Factor loadings for FINSIZE and EFFECT

	FINSIZE	EFFECT	Uniqueness
credit_gdp	0.81993	-0.39091	0.14195
depasset_gdp	0.95784	-0.03491	0.06738
depas_totas	0.69033	0.37876	0.32777
m2_gdp	0.87484	0.08061	0.15726
margin	-0.19381	0.59154	0.56489
inflation	0.09701	0.47033	0.68998

I also control for variables that are traditionally considered to be important indicators for "follow the customer" and "attractiveness of the market" reasons. I have chosen the following variables: GDP per capita (**gdpcap**); the private domestic investments to GDP ratio (**inv_gdp**); the size of the population (popul); the ratio of foreign direct investments over GDP (**fdi_gdp**); tariff revenues as a percentage of imports (**tariff_imp**); trade to GDP (**trade_gdp**). Factor analysis showed that these six variables could be decomposed into two factors. The first factor is mainly composed of gdpcap,popul and tarif_imp and reflects wealth of the country (WEALTH), while inv_gdp and fdi_gdp mostly contribute for the second factor which reflect investment climate in the country (INVEST). The main motive for foreign bank entry is usually to follow their customers so if the country has high rate of both internal and external investments it should be expected that foreign banks will soon come. The higher the wealth of the country the more it is attractive for foreign banks.

Table 4. Factor loadings for WEALTH and INVEST

Variable	Wealth	INVEST	Uniqueness
gdpcap	0.72450	0.09276	0.43108
inv_gdp	0.02749	0.79960	0.34500
popul	0.84611	-0.22682	0.22396
fdi_gdp	-0.14127	0.78674	0.34811
trade_gdp	-0.41389	-0.00785	0.68141
tarif_imp	0.88816	0.01416	0.20369

I have one indicator of political reforms in the country (POLITICS) that is represented by Polity score, the lowest value (-10) of which identifies strongly democratic countries and the highest score (+10) tells about strong autocracy. Foreign banks consider very carefully political situation of the country that is why as far as country is democratic it will be much more attractive than dictatorship.
So the lower the polity score, the more country is attractive to foreign banks.
If we look at our constructed variables we can find that there is no correlation between factors (see Table). Thus I avoided multicollinearity problem between explanatory variables.
One important shortcoming of constructed variables is that while trying to interpret regression it would be practically impossible or incorrect to do sensitivity analysis. The reason lies in the whole procedure of construction where the same variables constitute two independent factors and that is why if we want to increase one factor and to see its influence on the change in dependent variable, the second factor constructed from the same variables as the first will also change. So we cannot discriminate change in dependent variable due to pure change in one factor. Nonetheless, we will be able to find which factors attracted foreign banks in CIS countries.

Table 5. Correlation between constructed dependent variables

```
corr  FINSIZE REFORM INVEST EFFECT WEALTH POLITICS
(obs=96)

             |   FINSIZE    REFORM    INVEST    EFFECT    WEALTH
POLITICS
-------------+------------------------------------------------
-----
     FINSIZE |    1.0000
      REFORM |   -0.0037    1.0000
      INVEST |    0.0129    0.0131    1.0000
      EFFECT |   -0.0111    0.0143   -0.0231    1.0000
      WEALTH |   -0.0173   -0.0023    0.0120   -0.0049    1.0000
    POLITICS |    0.0162    0.0206   -0.0511   -0.0600   -0.0113
1.0000
```

Chapter 5

EMPIRICAL RESULTS

Now, on the basis of constructed factors and dependent variable we can test which factors are important for foreign bank entry. My investigation will include the following steps:

1) I will consider the period of 1999-2004 and test which factors were crucial for foreign bank entry by taking foreign bank assets to total banks assets as dependent variable;
2) Taking into account that I have data on the number of foreign banks to total number of banks for the period of 1994-2004, I will test which factors were important for foreign banks during all available period.
3) On the basis of obtained variables for economic reforms (REFORM) and financial sector efficiency (EFFECT) I will test whether economic reforms influenced financial sector efficiency. For this purpose I will be using system of two equations with number of foreign banks to total number of banks and efficiency of financial sector as endogenous variables.

Firstly, I take 1999-2004 period and logarithm of share of foreign bank assets to total banking assets (logfas_tasset) as dependent variable. Breusch-Pagan / Cook-Weisberg test shows that there is no problem of heteroskedasticity and Breusch and Pagan Lagrangian multiplier test for random effects tells in favor of simple OLS should be used.

Table 6. Regression results for 1999-2004, foreign bank assets to total banks assets as dependent variable.

Source	SS	df	MS	Number of obs =	48
Model	21.34438	6	3.55739667	F(6, 41) =	5.46
Residual	26.7098059	41	.651458679	Prob > F =	0.0003
				R-squared =	0.4442
Total	48.0541859	47	1.02242949	Adj R-squared =	0.3628
				Root MSE =	.80713

logfas_tas~t	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
FINSIZE	-.286591	.148754	-1.93	0.061	-.5870059	.0138238
REFORM	.2514089	.1158384	2.17	0.036	.0174685	.4853494
INVEST	-.1005433	.1308497	-0.77	0.447	-.3647996	.163713
EFFECT	.0516936	.1282424	0.40	0.689	-.2072972	.3106844
WEALTH	1.341619	.3773568	3.56	0.001	.5795311	2.103706
POLITICS	-.019901	.141376	-0.14	0.889	-.3054157	.2656137
_cons	2.455708	.1768225	13.89	0.000	2.098608	2.812808

In table we can see estimation results where financial sector size negatively affects foreign bank entry which is in accordance with my expectations because small and undeveloped financial markets possess good prospects for foreign banks. Economic reforms in the country attract banks and my estimation proved this empirical fact. The richer the country more foreign banks want to participate in serving customers with growing incomes and rising consumer needs as well as exporters which need finance to be involved in international trading. While unexpected, investment climate, efficiency of financial sector and political situation appeared to be insignificant for foreign bank entry.

Secondly, I take 1994-2004 period and logarithm of share of number of foreign banks to total number of banks (logfbank_tbank) as dependent variable. Breusch-Pagan / Cook-Weisberg test shows that there is also no problem of heteroskedasticity and Breusch and Pagan Lagrangian multiplier test for random effects tells in favor of simple OLS should be used.

Table 7. Regression results for 1994-2004, number of foreign banks to total number of banks as dependent variable.

```
      Source |       SS       df       MS              Number of obs =      96
-------------+------------------------------           F(  6,    89) =   19.49
       Model |  64.2824318     6  10.7137386           Prob > F      =  0.0000
    Residual |  48.9195541    89  .549657911           R-squared     =  0.5679
-------------+------------------------------           Adj R-squared =  0.5387
       Total |  113.201986    95  1.19159985           Root MSE      =  .74139

------------------------------------------------------------------------------
logfbank_t~k |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      REFORM |   .4529647   .1216773     3.72   0.000     .2111945    .6947349
     FINSIZE |  -.0547758   .1029933    -0.53   0.596    -.2594214    .1498697
      EFFECT |  -.6720102   .1365263    -4.92   0.000    -.9432851   -.4007353
      WEALTH |  -.4173205   .0928923    -4.49   0.000    -.6018955   -.2327455
      INVEST |  -.1583556   .1094919    -1.45   0.152    -.3759137    .0592025
    POLITICS |  -.0869977   .0171774    -5.06   0.000    -.1211287   -.0528667
       _cons |   2.216962   .0825227    26.86   0.000     2.052992    2.380933
------------------------------------------------------------------------------
```

With the change of dependent variable I received a little bit different results where political situation in the country started to play role for foreign bank entry, while financial sector size is not important. As in the previous regression, economic reforms attract foreign banks while investment climate is not taken into consideration. Interesting result is obtained for wealth of the country indicator, in this regression it negatively affect number of foreign banks to total number of banks in the country in contrast to its positive influence on foreign bank assets to total banks assets indicator. I can explain this result in the way that usually in the countries with small population and low incomes foreign banks prefer to open representative offices but avoid to create branches and subsidiaries that is why the number of foreign banks in these countries is pretty big but assets of these banks are not significantly large.

Comparative results of both regressions can be seen in Table.

Thirdly, in order to test whether economic reforms influenced financial sector size efficiency during 1994-2004 I solve system of two equations with number of foreign banks to total number of banks and efficiency of financial sector as dependent variables with the use of three-stage least square regression. Regression results can be seen in Table and proved that economic reforms

positively affected financial sector size efficiency. It should be mentioned once again, that the main contributors to EFFECT indicator are inflation and margins, so when these variables start to increase efficiency of financial sector decreases.

Table 8. Summary of estimation results

	logfas_tasset 1999-2004	**logfbank_tbank 1994-2004**	**Expected**
FINSIZE	-	Insignificant	-
REFORM	+	+	+
INVEST	Insignificant	Insignificant	+
EFFECT	Insignificant	-	-
WEALTH	+	-	+
POLITICS	Insignificant	-	–

Table 9. Three-stage least squares regression, 1994-2004

```
Three-stage least squares regression
------------------------------------------------------------------------------
Equation          Obs  Parms        RMSE    "R-sq"       chi2        P
------------------------------------------------------------------------------
logfbank_t~k       96      5    1.179573   -0.1800      54.08   0.0000
EFFECT             96      2    .5499586    0.1708      12.80   0.0017
------------------------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
logfbank_t~k |
     FINSIZE |   -.097483   .1025996    -0.95   0.342    -.2985745    .1036085
      INVEST |  -.1317241   .0991989    -1.33   0.184    -.3261503    .0627022
      WEALTH |  -.3510494   .1015843    -3.46   0.001    -.5501509   -.1519479
    POLITICS |  -.0775267   .0180536    -4.29   0.000     -.112911   -.0421423
      EFFECT |  -2.331464   .4568529    -5.10   0.000    -3.226879   -1.436048
       _cons |    2.33536   .1083409    21.56   0.000     2.123016    2.547704
-------------+----------------------------------------------------------------
EFFECT       |
      REFORM |  -.2251199   .0752443    -2.99   0.003     -.372596   -.0776438
logfbank_t~k |  -.0585976   .0830131    -0.71   0.480    -.2213003    .1041051
       _cons |   .1978281   .1901208     1.04   0.298    -.1748019    .5704581
------------------------------------------------------------------------------
Endogenous variables:  logfbank_tbank EFFECT
Exogenous variables:   FINSIZE INVEST WEALTH POLITICS REFORM
```

Chapter 6

CONCLUSIONS

The development of a financially sound and market-oriented banking system thought to be fundamental to a successful transition from a communist to a market-based economy. Foreign banks can contribute a lot in financial sector development and that is why they are of significant importance for the governments which should make a lot in order to make their economies attractive for foreign bank entry.

This research has found that level of economic reforms, wealth of the country; political risks and financial sector size were the determinants of foreign bank entrance in CIS countries within 1994-2004.

Practically all CIS countries are still lagging behind in foreign bank presence and do not have experienced banks to help their financial sectors to improve. That is why this research is policy oriented as it explains that government should enforce economic reforms and reduce political risks in order to be attractive for foreign banks. Moreover, research has shown that economic reforms positively influenced efficiency of financial sector in CIS countries during observed period, so governments can make their best in improving financial sector by implementing economic reforms.

European Bank for Reconstruction and Development (EBRD) conducted a research on banking reform and development in transition countries. They found that the progress in banking and enterprise reform became the main contributors in banking development. They also made a comparative analysis on the level of reforms for 3 groups of transition countries (Central Eastern Europe and the Baltic States; South-eastern Europe; Commonwealth of independent States) and made a conclusion that the CIS countries are still lagging behind. Moreover, EBRD believes that mainly foreign banks can contribute significantly

to the banking development, particularly where confidence in domestic institutions remains low.

So my findings support EBRD recommendations that CIS governments should proceed with economic reforms as they enhance financial sector efficiency. Also, there was found evidence that foreign banks may play crucial role. For example, Working Group "Foreign Direct Investments in the Financial Sector" established under the initiative of the Committee on The Global Financial System (Bank for International Settlements) which started to explore issues related to foreign direct investment primarily in the financial sectors of emerging market countries (BIS, 2004).

The Working Group found that the presence of foreign financial institutions in these countries is permanent and as there exist high entry and exist costs of operations in transition countries. Therefore, the decision of foreign banks' to enter the transition countries is deliberate and long perspective and not explained by speculative motives.

The Working Group accumulated all the investigations of researchers who previously studied foreign banks' phenomena either for developed or emerging countries, reports of central banks from host and home countries as well as interviews with 40 financial institutions who entered the countries of particular interest. On the basis of this material they came to the understanding of the impact foreign banks made in the development of the host countries. Foreign financial institutions may support the development of local financial markets in emerging markets; foreign banks contribute to financial stability in the host countries in the medium and long term by enhancing the capacity of the system to absorb shocks; these banks bring transfer of ownership and managerial control. Moreover, foreign banks may represent an invaluable source of capital for small firms and push the creation of new companies (Giannetti , Onega (2005)) and even help in resolution of "related parties" lending problem (La Porta, et. al 2002).

Foreign banks may be a powerful tool for development of financial sector and economic growth that is governments of CIS countries should use the possibility and make their countries attractive for foreign bank entry.

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Appendix 1: Description of the variables

Variable	Definition	Source
fas_tasset	Value of assets of foreign deposit money banks divided by the value of assets of all banks	EBRD Transition report (various issues)
fbank_tbank	Total number of foreign banks divided by total number of banks	EBRD Transition report (various issues)
ebrdbankr	Reform in the banking sector and interest rate liberalization. Dummy variable with range 1-4	EBRD Transition report (various issues)
ebrdtrader	The transition of trade and the foreign exchange system. Dummy variable with range 1-4	EBRD Transition report (various issues)
ebrdinterpr	Extent of transition within enterprise. Dummy variable with range 1-4	EBRD Transition report (various issues)
privat_gdp	Share of the private sector relative to the public sector	EBRD Transition report (various issues)
POLITICS	Degree of democracy. Dummy variable (-10-+10)	www.cidcm.umd.edu/inscr/**polity**/
credit_gdp	Private credit by deposit money banks divided by GDP	International Financial statistics, IMF (various issues)
depasset_gdp	Deposit money bank assets divided by GDP	International Financial statistics, IMF (various issues)
depas_totas	Deposit money bank assets divided by the sum of central bank assets and deposit money bank assets	International Financial statistics, IMF (various issues)
m2_gdp	M2 divided by GDP	International Financial statistics, IMF (various issues)
margin	Lending minus deposit	International Financial statistics, IMF

	rate	(various issues)
inflation	Rate of inflation	EBRD Transition report (various issues)
gdpcap	GDP per capita, in US dollars	EBRD Transition report (various issues)
inv_gdp	Investment rate divided by GDP	EBRD Transition report (various issues)
popul	The size of population, in millions	EBRD Transition report (various issues)
fdi_gdp	Foreign direct investments divided by GDP	EBRD Transition report (various issues)
trade_gdp	Trade divided by GDP	EBRD Transition report (various issues)
tarif_imp	Tariff revenues divided by imports	EBRD Transition report (various issues)
crisk	Country risk	World Development Indicators
M2_res	M2 divided by reserves	International Financial statistics, IMF (various issues)

Appendix 2: Summary statistics of variables

Belarus

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	6	10.5	7.635444	3	20
fbank_tbank	10	23.87119	22.17705	2.380952	59.375
ebrdbankr	11	1.281818	.3995452	1	2
ebrdtrader	11	1.690909	.575247	1	2.3
ebrdinterpr	11	1.127273	.283164	1	1.7
ebrdnonbank	11	2	0	2	2
privat_gdp	11	20	3.872983	15	25
polity	11	-5.090909	4.526689	-7	7
credit_gdp	11	10.20785	3.671546	6.142906	17.55262
depasset_gdp	11	27.27761	13.69884	17.56404	61.42577
depas_totas	11	69.44121	5.516476	60.42954	77.01924
m2_gdp	11	19.27962	8.022699	14.32111	38.95594
margin	11	26.27273	21.82013	6.6	74.2
inflation	11	339.3636	655.9556	18.1	2221
gdpcap	11	1324.909	465.8316	472	2324
inv_gdp	11	25.54545	3.07778	22	33
popul	11	10.08182	.1834023	9.8	10.3
fdi_gdp	11	1.804591	1.464962	.1439744	4.744661
trade_gdp	11	111.6364	15.66699	89	136
tarif_imp	11	3.454545	.8201995	2	5

Armenia

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	6	51.83333	5.741661	44	58
fbank_tbank	11	28.39581	16.09826	2.439024	46.66667
ebrdbankr	11	2.127273	.3926599	1	2.3
ebrdtrader	11	3.781818	.6823756	2	4.3
ebrdinterpr	11	1.990909	.356243	1	2.3
ebrdnonbank	11	1.636364	.504525	1	2
privat_gdp	11	58.63636	10.74498	40	75
polity	11	3	4.538722	-6	7
credit_gdp	11	7.874215	1.839968	5.623261	11.07322
depasset_gdp	11	14.31248	3.228679	8.624168	18.62987
depas_totas	11	45.35151	5.70022	35.22918	54.81423
m2_gdp	11	11.75583	2.765899	7.706491	15.55698
margin	11	19.06636	13.53981	0	48.68
inflation	11	500.6273	1583.652	-.8	5273
gdpcap	11	604.4455	263.4189	172.7	1104
inv_gdp	11	19.45455	2.504541	16	24
popul	11	3.354545	.3559878	3	3.8
fdi_gdp	11	4.639582	3.052842	1.184401	12.07473
trade_gdp	11	140.5455	267.5449	53	947
tarif_imp	11	2	.6324555	1	3

Azerbajdjan

Variable	Obs	Mean	Std. Dev.	Min	Max

fas_tasset	5	4.82	.6797059	4.1	5.8
fbank_tbank	11	6.642923	3.118354	.952381	11.36364
ebrdbankr	11	1.927273	.4797727	1	2.3
ebrdtrader	11	2.845455	.8925958	1	3.7
ebrdinterpr	11	1.827273	.3608072	1	2.3
ebrdnonbank	11	1.445455	.3531675	1	1.7
privat_gdp	11	44.09091	15.30003	20	60
polity	11	-6.363636	1.206045	-7	-3
credit_gdp	11	3.989681	2.067263	1.166069	6.85542
depasset_gdp	11	21.99527	16.96628	12.75284	71.92846
depas_totas	11	48.88419	10.10477	33.79831	69.64645
m2_gdp	11	16.91378	13.0338	10.72912	55.93219
margin	11	9.954545	5.908361	0	20
inflation	11	191.3636	503.6226	-8.5	1664
gdpcap	11	593.4545	249.9209	171	1032
inv_gdp	11	31.88182	11.47962	15.6	50.2
popul	11	7.990909	.2300198	7.6	8.3
fdi_gdp	11	16.67963	10.13192	2.883239	32.41771
trade_gdp	11	69.50909	18.28341	53.7	116.8
tarif_imp	11	5.736364	3.533065	1.1	12.5

Georgia

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	6	25.5	17.89693	12	58
fbank_tbank	11	6.272727	2.493628	1	9
ebrdbankr	11	2.163636	.4272534	1	2.7
ebrdtrader	11	3.590909	1.122902	1	4.3
ebrdinterpr	11	1.909091	.3015113	1	2
ebrdnonbank	11	1.318182	.3655631	1	1.7
privat_gdp	11	53.63636	15.01514	20	65
polity	11	4.909091	.3015113	4	5
credit_gdp	10	6.034041	2.0335	3.322069	8.685698
depasset_gdp	10	9.404594	3.366395	5.268781	13.81821
depas_totas	10	24.15733	9.156031	14.47365	37.95945
m2_gdp	10	9.166599	2.683507	4.962371	12.47928
margin	10	27.959	9.995547	18.84	51.9
inflation	11	1442.182	4698.173	3.6	15607
gdpcap	11	690.6364	226.1001	232	1124
inv_gdp	11	15.09091	9.512671	2	27
popul	11	5.036364	.4177865	4.6	5.4
fdi_gdp	11	4.227903	3.104401	.1997834	9.705155
trade_gdp	11	51	14.97331	37	90
tarif_imp	11	5	2.932576	0	8

Kazahstan

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	1	6	.	6	6
fbank_tbank	11	26.34447	14.19618	4.347826	44.73684
ebrdbankr	11	2.327273	.5623005	1	3
ebrdtrader	11	3.318182	.5776126	2	4
ebrdinterpr	11	1.818182	.4045199	1	2

ebrdnonbank	11	2.027273	.2831639	1.7	2.3
privat_gdp	11	51.81818	16.16674	20	65
polity	11	-4.454545	1.035725	-6	-3
credit_gdp	11	10.78837	6.928482	.0264177	21.84287
depasset_gdp	11	17.52472	9.697356	5.657387	34.2768
depas_totas	11	45.39743	11.83332	19.23311	57.72428
m2_gdp	11	14.37647	4.166985	8.57184	20.29096
margin	10	6.61	4.788052	2.5	15
inflation	11	198.2818	563.9676	5.8	1892
gdpcap	11	1478.636	534.0396	721	2703
inv_gdp	11	20.81818	4.996362	12	27
popul	11	15.29091	.4867333	14.8	16.2
fdi_gdp	11	8.310571	2.891455	5.527028	13.65977
trade_gdp	11	70.81818	10.04807	57	90
tarif_imp	11	2.818182	1.250454	2	6

Kyrgyzstan

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	6	42.83333	21.05627	17	70
fbank_tbank	11	25.55125	10.86241	15	52.63158
ebrdbankr	11	2.290909	.242712	2	2.7
ebrdtrader	11	3.990909	.3562431	3	4.3
ebrdinterpr	11	2	0	2	2
ebrdnonbank	11	1.881818	.3060006	1	2
privat_gdp	11	56.81818	12.50454	30	75
polity	11	-3	0	-3	-3
credit_gdp	10	5.460874	2.340868	3.378182	11.07282
depasset_gdp	10	9.897159	2.433396	7.001611	13.34318
depas_totas	10	25.92948	5.817564	19.21207	34.67444
m2_gdp	10	14.07044	2.130598	11.14465	17.5279
margin	9	22.63333	9.770107	9.8	37.6
inflation	11	37.02727	65.06037	2	228.7
gdpcap	11	340.7727	58.11862	249.1	433
inv_gdp	11	15.54545	5.260487	6	23
popul	11	4.727273	.1902152	4.5	5.1
fdi_gdp	11	3.237219	2.602015	-.5173047	7.366064
trade_gdp	11	69	7.416198	56	81
tarif_imp	11	1.454545	.522233	1	2

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Moldova

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	6	35.83333	2.316607	34	40
fbank_tbank	7	9.428571	1.272418	7	11
ebrdbankr	11	2.227273	.2148996	2	2.7
ebrdtrader	11	3.927273	.6558825	2	4.3
ebrdinterpr	11	1.945455	.121356	1.7	2
ebrdnonbank	11	2	0	2	2
privat_gdp	11	45	11.18034	20	55
polity	11	7.363636	.504525	7	8

credit_gdp	11	11.76296	5.583401	3.689888	20.29784
depasset_gdp	11	24.4697	5.625987	18.0702	33.88059
depas_totas	11	47.58469	7.842249	39.1219	61.4192
m2_gdp	11	21.14324	6.305472	14.35545	31.76074
margin	9	8.541111	1.605214	6.03	11.3
inflation	11	46.57273	94.56723	5.2	329.7
gdpcap	11	434.2727	141.819	268	766
inv_gdp	11	21.45455	2.65946	16	25
popul	11	4.309091	.0301511	4.3	4.4
fdi_gdp	11	6.185294	4.088819	1.216421	14.48515
trade_gdp	11	99.45455	8.054361	87	113
tarif_imp	11	2	.7745967	1	4

Russia

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	0				
fbank_tbank	10	2.22083	.8093696	.9142359	3.233256
ebrdbankr	11	1.945455	.1809068	1.7	2.3
ebrdtrader	11	3.018182	.611258	2.3	4
ebrdinterpr	11	2.054545	.2252271	1.7	2.3
ebrdnonbank	11	2.2	.5549775	1.7	3
privat_gdp	11	65.90909	7.354652	50	70
polity	11	5.363636	1.566699	4	7
credit_gdp	11	13.46007	4.581741	7.33164	20.93529
depasset_gdp	11	31.74008	5.559819	22.27234	39.19091
depas_totas	11	60.17506	3.528515	51.87958	63.85181
m2_gdp	11	22.42831	4.160936	16.6507	29.91833
margin	10	43.17	66.26635	6.2	218
inflation	11	69.82727	97.23744	11	311.4
gdpcap	11	2403	750.8013	1347	4012
inv_gdp	11	19.81818	2.040499	15	22
popul	11	146.2545	1.522081	144.4	148.4
fdi_gdp	11	.3456925	.4652054	-.3933931	1.142797
trade_gdp	11	47.72727	6.943931	38	59
tarif_imp	11	14.36364	6.297186	7	25

Tajikistan

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	6	35.83333	35.09083	2	72
fbank_tbank	8	18.11115	6.045912	9.090909	25
ebrdbankr	11	1.218182	.3816233	1	2
ebrdtrader	11	2.627273	.7811413	1	3.3
ebrdinterpr	11	1.445455	.3531675	1	1.7
ebrdnonbank	11	1	0	1	1
privat_gdp	11	36.81818	11.67748	15	50
polity	11	-3.090909	2.256304	-6	-1
credit_gdp	7	12.65377	1.628439	10.56506	14.31131
depasset_gdp	7	14.51956	1.875489	11.76952	16.66401
depas_totas	7	.4188422	.0612759	.3499889	.5232459
m2_gdp	11	15.71818	22.23505	6.7	81.7
margin	11	39.30909	120.6332	-23	400
inflation	11	149.3545	208.8396	7.1	609

gdpcap	11	189.9182	54.59401	104.6	319
inv_gdp	11	18.45455	4.844866	13	29
popul	11	6.163636	.2460598	5.8	6.5
fdi_gdp	11	3.360327	3.397249	.8598726	13.25106
trade_gdp	11	141.3636	43.93011	99	261
tarif_imp	11	2.727273	1.420627	1	6

Turkmenistan

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	6	1.666667	.5163978	1	2
fbank_tbank	10	23.73091	12.74327	4.477612	36.36364
ebrdbankr	11	1	0	1	1
ebrdtrader	11	1	0	1	1
ebrdinterpr	11	1.190909	.3269696	1	1.7
ebrdnonbank	11	1	0	1	1
privat_gdp	11	22.72727	4.100998	15	25
polity	11	-9	0	-9	-9
credit_gdp	0				
depasset_gdp	0				
depas_totas	0				
m2_gdp	11	16.86364	4.923063	8.1	25.6
margin	11	21.95455	31.91239	-10	94
inflation	11	356.0636	605.2545	6.5	1748
gdpcap	11	569.2273	110.3915	387	765
inv_gdp	8	37	4.690416	32	46
popul	11	5.2	.746994	4	6.5
fdi_gdp	11	5.498645	1.612103	2.436584	8.576687
trade_gdp	11	130	33.79349	68	185
tarif_imp	5	.2	.4472136	0	1

Ukraine

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	6	11.66667	.5163978	11	12
fbank_tbank	11	7.093219	4.311803	.4347826	12.02532
ebrdbankr	11	1.990909	.356243	1	2.3
ebrdtrader	11	2.790909	.6007571	1	3
ebrdinterpr	11	1.909091	.3015113	1	2
ebrdnonbank	11	2	.1341641	1.7	2.3
privat_gdp	11	55.90909	8.312094	40	65
polity	11	6.818182	.4045199	6	7
credit_gdp	11	10.43921	8.262873	1.39284	24.58117
depasset_gdp	11	21.17772	8.51795	11.68951	35.095
depas_totas	11	51.97957	6.732635	43.21122	63.27699
m2_gdp	11	21.27492	8.513249	11.55556	35.78106
margin	11	28.00909	13.15496	9.6	53
inflation	11	132.0273	274.3343	.8	891
gdpcap	11	860.2091	214.4121	631	1370
inv_gdp	11	20.81818	2.182576	18	26
popul	11	49.75455	1.497574	47.3	51.7
fdi_gdp	11	1.824582	.6514206	.8538111	2.848723
trade_gdp	11	85.18182	9.432054	70	98
tarif_imp	11	2.181818	.7507572	1	3

Uzbekistan

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	6	3.083333	1.062858	2	4.4
fbank_tbank	11	12.53422	5.514478	3.225806	17.85714
ebrdbankr	11	1.636364	.211058	1	1.7
ebrdtrader	11	1.654545	.3503245	1	2
ebrdinterpr	11	1.772727	.2969542	1	2
ebrdnonbank	11	2	0	2	2
privat_gdp	11	40.90909	8.312094	20	45
polity	11	-9	0	-9	-9
credit_gdp	0				
depasset_gdp	0				
depas_totas	0				
m2_gdp	11	16.19091	7.007062	10.3	34.7
margin	9	16.85556	10.36112	6.4	40
inflation	11	206.0273	458.7547	8.8	1568
gdpcap	11	389.2	80.01261	255.4	521.1
inv_gdp	8	21.5625	4.395431	17.1	29.3
popul	11	24.29091	1.28721	22.3	26
fdi_gdp	11	1.00259	.5298136	-.2622516	1.545092
trade_gdp	11	65.76364	12.92357	52.2	99.6
tarif_imp	11	2.336364	.7513624	1.3	3.8

.Consolidated

Variable	Obs	Mean	Std. Dev.	Min	Max
fas_tasset	60	22.37667	22.00454	1	72
fbank_tbank	122	15.98606	13.76571	.4347826	59.375
ebrdbankr	132	1.844697	.551793	1	3
ebrdtrader	132	2.85303	1.126532	1	4.3
ebrdinterpr	132	1.749242	.4176445	1	2.3
ebrdnonbank	132	1.709091	.4904359	1	3
privat_gdp	132	46.02273	17.24032	15	75
polity	132	-1.045455	6.236881	-9	8
credit_gdp	104	9.204533	5.367554	.0264177	24.58117
depasset_gdp	104	19.59738	11.00079	5.268781	71.92846
depas_totas	104	43.85337	18.93826	.3499889	77.01924
m2_gdp	130	16.67511	9.454793	4.962371	81.7
margin	123	22.76333	42.58469	-23	400
inflation	132	305.7265	1464.078	-8.5	15607
gdpcap	132	823.2235	682.8275	104.6	4012
inv_gdp	126	21.95397	7.941523	2	50.2
popul	132	23.53788	39.26023	3	148.4
fdi_gdp	132	4.759719	5.558443	-.5173047	32.41771
trade_gdp	132	90.16667	82.76175	37	947
tarif_imp	126	3.855556	4.226063	0	25

	fas_tasset	fbank_tbank	ebrdbankr	ebrdtrader	ebrdinterpr	ebrdnonbank	privat_gdp	polity	credit_gdp	depasset_gdp	depas_totas	m2_gdp	margin	inflation	gdpcap	inv_gdp	popul	fdi_gdp	trade_gdp	tarif_imp
fas_tasset	1																			
fbank_tbank	0.3948	1																		
ebrdbankr	0.0153	-0.0928	1																	
ebrdtrader	0.468	-0.0961	0.7241	1																
ebrdinterpr	0.2489	-0.2702	0.6923	0.7709	1															
ebrdnonbank	-0.0442	0.2777	0.4227	0.0162	0.0433	1														
privat_gdp	0.2728	-0.1277	0.7749	0.7777	0.9095	0.1306	1													
polity	0.301	-0.2949	0.4016	0.4931	0.4652	0.157	0.4769	1												
credit_gdp	-0.1017	-0.237	0.0033	-0.1791	-0.1336	0.0589	-0.0806	0.4196	1											
depasset_gdp	-0.1547	-0.0963	0.0072	-0.2857	-0.2843	0.4089	-0.2677	0.2856	0.8359	1										
depas_totas	-0.2774	0.2792	0.0436	-0.4059	-0.3399	0.7368	-0.3108	-0.0559	0.2297	0.6423	1									
m2_gdp	-0.1301	-0.1526	0.2936	-0.061	0.018	0.6146	0.0989	0.3928	0.6761	0.8196	0.62	1								
margin	-0.1984	-0.1257	0.1534	-0.041	0.041	0.3676	0.1202	0.1334	-0.3884	-0.2792	0.077	-0.0043	1							
inflation	-0.2203	-0.0629	-0.5995	-0.6786	-0.6108	0.0633	-0.637	-0.3093	-0.0283	0.1813	0.2775	0.0032	0.2422	1						
gdpcap	-0.3294	0.3418	0.1031	-0.4211	-0.3505	0.4616	-0.2222	-0.2753	0.1865	0.3759	0.6344	0.2589	0.0242	0.126	1					
inv_gdp	-0.2906	-0.1674	0.1106	-0.0624	0.0773	0.1131	-0.0924	-0.2321	-0.0892	0.065	0.3743	0.053	-0.0785	0.0381	0.364	1				
popul	-0.3674	-0.2479	-0.001	-0.3788	0.0523	0.2558	0.1014	0.2826	0.4485	0.3432	0.2846	0.5181	0.2301	-0.0096	0.2026	-0.0659	1			
fdi_gdp	-0.1731	-0.2256	0.3272	0.2038	0.3593	-0.016	0.1834	-0.1576	-0.0474	0.0046	0.0878	-0.028	-0.232	-0.1251	0.1035	0.7542	-0.1759	1		
trade_gdp	-0.0501	0.0494	-0.6975	-0.5993	-0.6571	-0.2766	-0.6977	-0.25	0.4921	0.4387	0.1084	0.1252	-0.4549	0.3464	0.0577	-0.0328	0.1329	-0.1548	1	
tarif_imp	-0.3768	-0.4313	0.1585	0.0392	0.1135	-0.2453	0.0573	-0.1713	-0.2484	-0.2178	-0.0976	-0.2067	0.0386	-0.0888	0.1357	0.3573	-0.0978	0.2747	-0.3791	1

Appendix3