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FOREIGN BANK PARTICIPATION AND BANKING CRISES IN TRANSITION ECONOMIES

ABSTRACT

Using a fixed effect multivariate panel logit econometric model and taking possible endogenity problem into account, we test the hypothesis that foreign bank participation contributes to decrease in banking crises in transition economies in 1990-2006. The results suggest that foreign bank participation decreases the possibility of banking crises, controlling for other factors that may cause banking crises. This paper contributes to the literature by presenting the first empirical evidence on the negative relationship between the actual level of foreign bank presence (or foreign bank concentration) and banking crises for transition countries.

Keywords: *Financial Crises, Banks, Capital and Ownership Structure, Transitional Economies, Panel Study.*
JEL codes: *G01, G21, G32, P2, C2;*

I. INTRODUCTION

Banking crises have proliferated throughout the world in recent decades as documented by the comprehensive studies of Caprio and Klingebeil (1996 and 2003), Lindergen, Garcia and Saal (1996), Dizoebek and Pazarbasioglu (1997), Demirguc and Detragiache (1998), Kaminsky and Reinhart (1999), Demirguc-Kunt and Kane (2002), and Laeven and Fabian (2008). Lindergen, Garcia and Saal (1996) report that 133 of 181 IMF members had experienced noteworthy banking distress over the period of 1980-1996. Demirguc-Kunt and Kane (2002) document 112 incidences of systemic crises in 93 countries and 51 incidences of borderline crisis in 46 countries. Caprio and Klingebeil (2003) identify 77 financial crises episodes have taken place in 72 developing countries since the mid-1990's. Laeven and Fabian (2008) report 42 systemic banking crises from 37 countries for the period 1970 to 2007.

Acquisition and ownership of banks by foreigners in emerging markets have also increased significantly in the last decade. This trend has been more dramatic for Eastern Europe and Latin America than for East Asia, Africa, and the Middle East. In most countries in Latin America and Eastern Europe, foreign controlled banks at present dominate the banking system, controlling more than 50 percent of total banking assets. Foreigners on

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average control more than 80 percent of total banking assets in sixteen transition economies in Central and Eastern Europe.

Greater foreign bank participation may be associated with a reduced probability of banking crises. However, theoretical relationship between foreign bank participation and banking crises is ambiguous. On the one hand, the presence of foreign banks may enhance financial stability through promoting the stability of the domestic deposit base, making banking system more robust to adverse domestic or external shocks, stabilizing credit supply during a negative shock, improving prudential supervision and regulation of the domestic financial system, and enhancing the transparency in the banking sector and efficiency of the macroeconomic policies. On the other hand, foreign banks can bring financial instability through stimulating capital flight and importing shocks from their home countries or from other countries where they operate.

There is a possibility of reverse causality between foreign bank participation and banking crises. In some countries, foreign banks enter the host country following financial crises. In the aftermath of banking crises, banking authorities in the host countries reduce entry restriction to recapitalize their banking sector. Foreign banks viewed this sort of policies as opportunities to acquire domestic banks or expand their existing subsidiaries.

At the empirical level, there are two main cross-country studies on the impact of foreign bank participation on banking crises in developing countries. Using time series cross country data over the 1988-1995 time period, Demirguc-Kunt et al. (1999) find that increase in the number of foreign banks is negatively associated with the incidence of banking system fragility. However,

1) This study ignores the potential endogeneity of foreign bank participation, i.e. reverse causality between foreign bank participation and crisis.
2) They use FOREIGN ASSET (The ratio of foreign bank assets to bank assets in the economy) and FOREIGN BANKS (The number of foreign bank divided by the total number of banks in the economy) variables to study the effect of foreign bank participation on the likelihood of banking crises. In their study, the coefficient on the FOREIGN ASSET variable is statistically insignificant while the coefficient on the FOREIGN BANKS variable is negatively and significantly correlated with the likelihood of experiencing a banking crisis. Thus, their results suggest that foreign banks reduce domestic bank fragility as they enter the economy rather than as they banks gain market share.
3) Their sample includes 5 transition economies. None of transition countries in their sample had experienced banking crisis during the estimation period.

Using cross-country data, Bart et al. (2002) find that the likelihood of a major banking crisis is positively associated with greater limitations on foreign-bank participation (Limitations on Foreign Bank Entry/Ownership). Consistent with Demirguç-Kunt et al. (1999), they find that the actual level of foreign bank presence (or foreign bank concentration) and foreign-bank ownership per se is not critically linked to the likelihood of a crisis. However,

1) Their banking crises study ignores the potential endogeneity of foreign bank participation.
2) Their banking crisis data is taken from Caprio-Klingebiel (1999); however the regulatory and supervisory variables including foreign bank participation variables are measured over the 1998-2000 period. Thus, as they state in their paper, their crises regressions should be interpreted in an especially circumspect manner.
3) Their sample for banking crises regressions includes 40 countries. Their sample does not include any transition economies and banking crises in transition economies.
4) They use Limitations on Foreign Bank Entry/Ownership and Entry into Banking Requirements variables to study the link between banking crises and foreign bank participation. Limitations on Foreign Bank Entry/Ownership variable takes the value of 1 if there are any limitations or restrictions placed on the ownership of domestic banks by foreign banks and there are any limitations placed on the ability of foreign banks to enter the

domestic banking industry and takes the value of 0 otherwise. Entry into Banking Requirements variable measures the specific legal requirements for obtaining a license to operate as a bank.

Unlike the studies mentioned above, our paper takes the potential endogeneity of foreign bank participation (reverse causality between foreign bank participation and crisis) into account. Therefore, we used one period lagged values of foreign bank participation to account for any possible endogeneity problem. Contrary to Demirguç-Kunt et al. (1999) and Bart et al. (2002), we find that the actual level of foreign bank presence (or foreign bank concentration) is significantly linked to the likelihood of a crisis by using a fixed effect multivariate logit econometric model and panel data between 1990 and 2006.

None of the limited number of studies on the relationship between foreign bank participation and banking crises focuses on transition economies separately. The case of transition countries needs to be analyzed separately since the initial conditions in these countries are different from developed and developing countries. First, these countries started their privatization process with high levels of state ownership. Most of the entry of foreign banks has resulted from the privatization of state-owned banks. Second, private sector was absent or negligible when privatization process began. Third, privatizations were implemented around the same time. Finally, economic designs of the transition policies were the same. Hence, empirically verifying the existence of the relationship between foreign bank participation and banking crises in transition economies requires a separate analysis.

In present study, we explore the impact of foreign bank participation on banking crises in transition countries. Using fixed effect multivariate models and taking endogeneity problem into account, we found highly statistically significant negative relationship between foreign bank participation and banking crises across transition economies between 1990 and 2006. This paper contributes to the literature by presenting the first empirical evidence on the negative relationship between the actual level of foreign bank presence (or foreign bank concentration) and banking crises for transition countries.

The paper is organized as follows. In the next two sections, we analyze the pros and cons of foreign bank participation in terms of its impact on financial stability. We provide data and methodology in section 4. In section 5, we report and discuss estimation results. Finally, we conclude in section 6.

II. FOREIGN BANK PARTICIPATION AND FINANCIAL STABILITY

The presence of foreign banks may enhance financial stability through promoting the stability of the domestic deposit base, making banking systems more robust to adverse domestic or external shocks, stabilizing credit supply during a negative shock, improving prudential supervision and regulation of the domestic financial system, and enhancing the transparency in the banking sector and efficiency of the macroeconomic policies.

1) The presence of well-capitalized foreign banks can promote the stability of the domestic deposit base during banking crises in the host country. A bank run is the most disruptive if it takes the form of flight to currency, i.e. people hold their money in cash outside the banking system or they remove their foreign exchange funds from the country. In the case of anticipated trouble in the financial system, depositors in emerging markets often engage in capital flight. They not only try to buy foreign exchange with their domestic currency funds but also keep their funds out of the banking system. This causes stress on foreign exchange rates and the liquidity of domestic banks. Depositors generally perceive foreign banks more safer than domestic banks since foreign banks have external support of parent bank. At the presence of foreign banks, depositors may reshuffle their deposits from domestic banks to foreign banks instead of engaging in flight to currency or capital flight. As long as the foreign bank branches and subsidiaries do not have different reserve ratios than domestic banks, reshuffling deposits from domestic banks to foreign banks will not change

aggregate bank deposits, reserves or the money supply. Thus, this behavior of depositors may stabilize aggregate deposits during economic distress.

In their IMF mission to Indonesia, Malaysia, Philippines, Thailand and Korea after the Asian financial crises, Domac and Ferri (1999) observed that depositors transferred their funds from small and local domestic banks to large and nationwide domestic private and state owned banks, and from domestic banks to foreign banks. In all the countries under observation, foreign banks benefited from "the flight to quality" by depositors, and they increased their market share considerably. Similarly the IMF (2000, 42) reports that "rumors of financial difficulties at Postabank - the second largest retail bank in Hungary - led to a run by depositors that benefited in part foreign institutions". The expansion of foreign banks' presence in Argentina coincided with the phenomenon of the deposit base stability during the subsequent Asian, Russian, and Brazilian crises of late 1990s. Noting that "during more recent crises, deposits remained remarkably stable", Mathison and Roldos (2001, 42) attribute the greater stability of the deposit base to growing share of foreign banks in the Argentine financial system. Large presence of foreign banks in Pacific Islands (Fiji, Nauru, Papua New Guinea, the Solomon Islands and Vanuatu) and Jamaica have stabilized the domestic deposit base during banking crises (Tschoegl, 2003).

2) The presence of foreign banks can make banking systems of host countries more robust to adverse domestic or external shocks. Because international foreign banks have internationally diversified portfolios and only some part of their asset portfolio includes the local market exposure, they will be less affected by the host country-specific adverse shocks. Also, the branches and subsidiaries of large international banks usually have access to additional liquidity, foreign exchange and capital from their parents abroad in case of financial crises or difficulties.

Many developing countries have dollarized their financial markets in order to integrate themselves with international capital markets through liberalizing their capital accounts and financial markets. However, during financial crises, governments of those countries often found themselves lacking enough international reserves to function as a lender of last resort because a central bank cannot perform as a lender of last resort in a currency other than its own currency. During the crises, domestic banks in many emerging markets lost their access to international capital markets. Most of the domestic banks were not able to roll over their outstanding debt. The ones, who were able to renew their credit lines, had to commit very high interest rates. Because foreign international banks have better access to international financial markets and foreign exchange than domestic banks, the presence of subsidiaries and branches of international foreign banks may ease this problem by transferring liquidity at low rates into the host country in times of economic distress. By analyzing the responses of domestic banks and subsidiaries of foreign banks in the case of financial distress in Mexico during the period from December of 1997 to November of 1999, Reynoso (2002, p.26) concludes that subsidiaries of foreign banks have a better access to funding in foreign exchange in times of stress when there are weak domestic banks.

3) Foreign banks may contribute to greater stability of credit during the periods of crisis in the host country. Because foreign banks have better access to external funding sources they may be more stable lenders than domestic banks during a negative shock in the host country.

Examining the behavior of foreign and domestic banks in Latin American countries during crisis periods, Dages et al. (2000) and Cyrstal et al. (2002) find that foreign banks on average exhibited higher and more stable credit growth than domestic banks. Martinez Peria et al. (2005) find that foreign banks did not contract their credit supply during crisis in the host country. Detragiache and Gupta (2006) find no evidence that foreign banks abandoned the host country during the 1997-98 Asian crisis in Malaysia. De Haas and Van Lelyveld (2006) find evidence that while domestic banks contracted their credit supply, greenfield foreign banks did not reduce their credit supply during crisis periods in ten Central and Eastern Europe countries.

4) The presence of branches and subsidiaries of healthy international banks belonging to well-regulated financial systems can also improve prudential supervision and regulation of the host country. This is so since branches are not only supervised by supervisory authority of the host country, but also they are supervised on a consolidated basis with the parent bank by the home country's supervisory authority according to principles of the Basel committee on bank supervision. Because activities of the branches and subsidiaries of international banks are also supervised by the headquarters or supervisory authorities of the parent bank, they will bring internationally accepted disclosure, accounting, and auditing standards. As foreign banks transfer their risk management practices and internal control systems to domestic banks, the stability of financial system in the host country will improve. Analyzing the effects of foreign bank entry by evaluating the financial conditions and performance of foreign and domestic banks in seven Latin American countries over the 1995-2000 period Crystal et al. (2002) conclude that foreign banks on average sustained higher average risk-based capital ratios, followed a more aggressive provision policy against bad loans, and had better loan recovery rates reflecting their stricter loan classification standards and practices.

5) A strong presence of foreign banks can enhance the transparency in the banking sector and efficiency of the macroeconomic policies followed by the countries with weak domestic banking system and fiscal institutions. This in turn may reduce the probability of self-fulfilling currency crises and costly government rescue operations.

In emerging market economies and transition economies, it has been observed that domestic banks, whether owned by the private or government sector, are under heavy government pressure to lend directly or indirectly to the government. Since the wealth is also concentrated, there are also some special interest politics between banks and politicians. It is often the case that large banks with large bad debts are bailed out by the government since they are considered to be too big to fail. Lack of transparency in the regulatory and supervisory system allows these banks to hide and accumulate these large bad debts until they become real problem. In general, demands for bailing out coincide with the economic crises when the government most needs funds. Thus countries with weak financial systems tend to accumulate more public debt because the government has to bail out banks. Governments often finance this bail-out through higher taxes and inflation (i.e., by printing money), causing a welfare loss to the society. This in turn can result in a self-fulfilling speculative attack on domestic currency by inducing people to expect that government have to abandon its stabilization policy.

Foreign ownership of formerly government-owned banks and family-owned banks may reduce the likelihood of banking crisis. By privatizing government-owned banks, the governments in Czech Republic and Hungary removed them from their own direct control (Tschoegl, 2003). This brings a change in lending policy, risk management, and competition. Because a foreign bank knows that it is hard for the government to convince the public to bail out a foreign bank, it will be more cautious in its loan policy and credit risk underwriting. Thus, as the number of joint ventures with foreign banks increase in a domestic economy, one can expect a smaller shock to public debt generated by the banking system.

III. FOREIGN BANK PARTICIPATION AND FINANCIAL INSTABILITY

Foreing banks can bring financial instability through stimulating capital flight and importing shocks from their home countries or from other countries where they operate.

1) Foreign banks may facilitate financial instability when faced with problems in the host country. Because foreign banks have more alternative investment opportunities outside the particular host country, foreign banks may be more sensitive to adverse conditions in the host country. When host country conditions worsen, the funds of foreign banks can be reallocated outside the host country to seek external investment opportunities. In the extreme case, they may abandon the host country during the crisis.

While North American and European banks shifted their lending from Asia to Latin America and Europe during the Asian crisis, they reduced their holdings in all three regions during the Russian crisis (Van Rijckeghem and Weder, 2003). Examining the behavior of foreign banks in the US and other countries, Morgan and Strahan (2004) find that there is a positive association between foreign bank presence and business volatility. During Argentine crisis in 2001, Scotia Bank of Canada, Credit Agricole of France and Intesa of Italy refused to pump in more capital and walked away from their subsidiaries (Galindo et al., 2005; Tschoegl, 2003).

2) Foreign banks may also import shocks from their home countries or from other countries where they operate. In the extreme situation, foreign banks may abandon the host country when faced problems caused by their home country's economic conditions.

If the parent bank's financial condition is unhealthy, capital constrained parent bank may reduce activities of subsidiaries and allocate less capital to its foreign subsidiaries. On the other hand financially healthy parent banks may react in an opposite way. Financially healthy parent banks may expand their activities abroad when economic conditions in home country worsen and reduce their activities abroad when economic conditions in home country improves (Moshirian, 2001; De Haas and Van Lelyveld, 2006).

Peek and Rosengren (2000) report that subsidiaries of Japanese banks in the U.S. cut back lending in the U.S. during the banking crisis in Japan. This negatively affected construction and real estate sectors in the U.S. By analyzing the U.S. bank lending to emerging markets, Goldberg (2001) and Palmer (2000) conclude that the U.S. bank exposure to emerging markets are correlated with the U.S. economic conditions rather than economic fluctuations in the host countries. Jeanneau and Micu (2002) find that credit supply to emerging countries is positively correlated with the economic conditions in the major industrial countries. Examining foreign and domestic banks in ten Central and Eastern Europe, De Haas and Van Lelyveld (2006) find evidence that there is a significant negative relationship between home country economic growth and host country credit by greenfields. Martinez Peria et al. (2005) find that while Japanese banks reduce their lending to Latin America when economic conditions in their home countries worsened, other foreign banks increase their lending to Latin America when home country's economic conditions worsened.

IV. EMPIRICAL FRAMEWORK

In order to identify the determinants of banking crises in transition economies, the probability of banking crises is estimated as a function of a set of explanatory variables identified by the empirical literature as useful indicators of a bank's failure (macroeconomic factors, financial factors, and institutional factors) by using a logit model in an unbalanced panel data context. The period under study is between 1990 and 2006. Our sample includes 26 transition economies. We estimate the following fixed effect logit model specifications:

$$\Pr ob\left(y_{it}=1\right)=\frac{\exp\left(x_{it}'\beta+\alpha_i\right)}{1+\exp\left(x_{it}'\beta+\alpha_i\right)}\equiv\Lambda\left(x_{it}'\beta+\alpha_i\right)$$

where with its the largest presentation:

$$x_{it}'=\beta_1+\beta_2 Growth_{it}+\beta_3 Inflation_{it}+\beta_4\ Depreciation_{it}+\beta_5\ Interest_{it}+$$
$$\beta_6 Surplus/GDP_{it}+\beta_7 \Pr ivate/GDP_{it}+\beta_8 Creditgrowth_{it}+\beta_8 Cash/Bank_{it}+$$
$$\beta_{10} M2/\mathrm{Re}serves_{it}+\beta_{11} Foreignlag_{it}+\beta_{12} Bankreform_{it}$$

$y_{it}=1$ when a banking crisis takes place in *i-th* country at time *t*, otherwise $y_{it}=0$. α_i represents country specific effect for *i-th* country.

The theoretical and empirical literature has identified a vast array of variables potentially associated with banking crisis. The variables used in our analysis were chosen in light of the theory on the determinants of banking crises, previous studies found in the literature, country specific factors, and the availability of data. The explanatory variables

capturing macroeconomic factors, bank specific factors, external factors and institutional factors are defined below. Definitions and sources of variables are given in Table 1.

Table 1

Description of the Explanatory Variables and Sources

Variable Name	Definition	Source
GROWTH	Rate of Growth of Real GDP	IFS where available. Otherwise WDI
INFLATION	Rate of Change of the GNP Deflator	IFS
INTEREST	Real interest rate: Nominal Interest Rate minus the Contemporaneous Rate of Inflation	IFS, WDI
DEPRECIATION	Rate Of Depreciation of Local Currency Against the US Dollar	IFS
SURPLUS/GDP	Ratio of Central Government Budget Surplus to GDP	IFS
CASH/BANK	Ratio of Bank Liquid Reserves to Bank Assets	IFS
M2/RESERVES	Ratio of M2 to Foreign Exchange Reserves of the Central Bank	IFS where available. Otherwise WDI
PRIVATE/GDP	Ratio of Domestic Credit to the Private Sector to GDP	IFS
CREDITGROWTH	Rate of Growth of Real Domestic Credit	IFS
BANKREFORM	EBRD Index Of Banking Sector Reform	Selected Economic Indicators of EBRD
FOREIGNLAG	One Period Lagged Value of Asset Share of Foreign Banks (In Percent)	Selected Economic Indicators of EBRD

The dependet variable of our model is a dummy variable for crisis an it is equal to one if a country experienced a systemic banking crises at any point during the period of study as defined by Gerard Caprio and Daniella Kliengebiel (2003) and Luc Laeven and Valencia Fabian (2008), otherwise it is equal to zero. Table 2 shows crisis episodes as identified by Gerard Caprio and Daniella Kliengebiel (2003) and Luc Laeven and Valencia Fabian (2008).

Table 2

Banking Crises

Country	Crises Years	Country	Crises Years
Albania	1992-1997	Kyrgyz Republic	1990-1999
Armenia	1994-1996	Latvia	1995-1997
Azerbaijan	1995	Lithuania	1995-1996
Belarus	1995	Moldova	1994
Bosnia and Herzegovina	1992-2003	Montenegro	
Bulgaria	1995-1997	Poland	1990-1999
Croatia	1996-1998	Romania	1990-1999
Czech Republic	1991-1995	Russia	1995;1998
Estonia	1992-1995; 1998	Slovak Republic	1991-2000
FYR Macedonia	1993-1994; 1997	Slovenia	1992-1994
Georgia	1991-1996	Serbia	
Hungary	1991-1997	Tajikistan	1996
Kazakhstan	1991-1994	Ukraine	1997-1998

Macro Economic Variables

GROWTH: is the Rate of Growth of Real GDP. Negative macroeconomic shocks deteriorate the balance sheets of banks and banks' borrowers. The effects of adverse macroeconomic shocks on banking crises are captured by the rate of growth of real GDP.

INTEREST: is Real Interest Rate. Real interest rate is calculated as Nominal Interest Rate minus the Contemporaneous Rate of Inflation. Since one of the main functions of banks is maturity transformation, i.e. financing long term investments with short term borrowing, banks are subject to interest rate risk. One of the external macro economic conditions that have played a role in the banking crises especially in emerging markets is a sudden and sharp increase in world interest rates. A sharp rise in industrial country interest rates can curtail the flow of foreign funds to emerging markets and raise the cost of the foreign funds for domestic banks and firms. Thus, a large increase in short-term interest rates is likely to be a major source of systemic banking sector problems.

INFLATION: is the Rate of Change of the GNP Deflator. High inflation is associated with high net interest margins and profitability in the banking sector due to increase in the volume of banking transactions and banking activity as a result of high inflation. Hence, banking sectors of countries with a history of high inflation may face with problems after a successful stabilization program. On the other hand, a successful stabilization program also provides financial stability. Thus, in our model the expected sign for the coefficient on the rate of growth of inflation rate (the GNP deflator) is ambiguous.

DEPRECIATION: is the Rate of Depreciation of Local Currency Against the US Dollar. The rate of depreciation of the local currency is used in the model in order to test the hypothesis that bank failure may be driven by foreign exchange risk. Exchange rate shifts and foreign currency loans have been a source of banking problems in almost all financial crises in emerging markets. Unexpected exchange rate depreciations can negatively affect the banking sector directly when banks have sizeable un-hedged foreign liabilities and/or there is a maturity mismatch between bank assets and liabilities. Exchange rate depreciations can also indirectly affect the banking sector when large depreciation creates deterioration in the balance sheets of bank borrowers.

SURPLUS/GDP: is the Ratio of Central Government Budget Surplus to GDP. Measures to be taken to deal with problems in the balance sheets of banking sector may be delayed due to the budgetary difficulties of the central government. In turn, the initial problems may grow to systemic proportions and turn in to a full-fledged crisis. Thus, in our model the expected sign for the coefficient on the ratio of central government budget surplus to GDP is positive.

Financial Variables

CASH/BANK: is the Ratio of Bank Liquid Reserves to Bank Assets. If the banking system is illiquid and fragile, adverse macroeconomic conditions may affect bank balance sheets negatively and lead to banking crises. The ratio of bank cash and reserves to bank assets are used to capture liquidity in our model. The expected sign for the coefficient on the ratio of bank cash and reserves to bank assets is negative.

M2/RESERVES: is The Ratio of M2 to Foreign Exchange Reserves of the Central Bank. The ratio of M2 to foreign exchange rate reserves is used to test bank vulnerability to sudden capital outflows. Reversal of capital inflows has similar effects as bank runs by domestic depositors. When foreign investors lose their confidence, they withdraw their funds unexpectedly and refuse to roll-over existing debt stock. As domestic banks are unable to roll over their debts that are falling due, they will try to restore their liquidity by calling in domestic credits and selling their assets at fire-sale prices. This leads to financial crises and systemic crises in the market.

PRIVATE/GDP: is the Ratio of Domestic Credit to the Private Sector to GDP. In our model, the ratio of credit to the private sector to GDP is used to capture the extent to which financial liberalization has progressed. Inadequate preparation for financial liberalization has often preceded financial crises. Experiences of many countries indicates that the banking

crises occurred in countries where inadequate internal controls and inadequate prudential regulation and supervision existed when financial liberalization took place. Deregulation of a financial system and rapid credit growth can be disastrous if banking institutions and their regulators do not have adequate expertise, resources and training to monitor and evaluate risk taking. In many of the countries that have experienced financial liberalization, a significant rise in bank lending and risk taking has been observed.

CREDITGROWTH: is the Rate of Growth of Real Domestic Credit. Banking crises have often been preceded by both bank lending booms and boom-bust cycles. Lending booms, financed either by expansionary monetary and fiscal policies or large capital inflows, have often resulted in overinvestment in real assets, which leads to sharp rises in equity and real estate prices. Banks make loans to construction companies and the real estate sector since these sectors are thought to offer the best collateral. Initially, asset prices went up as borrowers bid up the price of real estate, and thus projects were seen as profitable. With this optimism, banks continue to over-lend to the projects. However, the debt servicing capacity of these sectors depends on continuous rise in property prices and strong demand, thereby creating vulnerability to an economic slowdown. A slowdown in economic growth may lead to a collapse of real estate market. When the bubble burst and real estate and equity prices decline sharply, banks face rising levels of non-performing loans and declining collateral values.

Institutional Variables

BANKREFORM: is the EBRD Index of Banking Sector Reform. Banking sector reform index is taken from EBRD which reports a yearly assessment of the level of banking restrictions in a country. The index ranges from 1 to 5 with higher values indicating greater restrictions. In constructing this index, EBRD considers the ease with which foreign banks can open branches and subsidiaries; government interference in the allocation of credit, including government ownership of banks; the ability of private banks to operate without government regulation such as deposit insurance; and the ability of banks to provide a wide range of financial services including real estate and securities transactions, and insurance. We would expect that countries that have experienced crises would have more restrictive banking environments.

FOREIGNLAG: is the lag of Asset Share of Foreign Banks (in percent). The relationship between foreign bank participation and banking crisis is ambiguous. On the one hand, the participation of foreign banks can enhance the stability of domestic banking and financial system through promoting the stability of the domestic deposit base, making banking systems more robust to adverse domestic or external shocks, stabilizing credit supply during a negative shock, improving prudential supervision and regulation of the domestic financial system, and enhancing the transparency in the banking sector and efficiency of the macroeconomic policies. On the other hand, foreign banks can bring financial instability through stimulating capital flight and importing shocks from their home countries or from other countries where they operate. The lagged value of the variable is used to account for any possible endogeneity problem.

V. ESTIMATION RESULTS

The main results of the econometric study are provided in Table 3. Table 3 presents the estimated coefficients for a number of alternative model specifications due to multicollinearity problems. The quality of the model specification is assessed based on Akaike's Information Criterion (AIC). The marginal effects are presented in Table 4.

Table 3

Selected Models

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Macroeconomic Variables						
GROWTH	-0.1708	-0.1397	0.1076	0.0124	0.2296	0.3622
	0.1008	0.1192	0.1496	0.1115	0.1813	0.2434
	[0.0903]	[0.2410]	[0.4721]	[0.9109]	[0.2054]	[0.1367]
INFLATION			0.0857	0.05903	0.0509	-0.1471
			0.0465	0.0385	0.0881	0.15709
			[0.0652]	[0.1252]	[0.5631]	[0.3489]
DEPRECIATION			0.0815	0.0545		0.1155
			0.0251	0.0212		0.0742
			[0.0012]	[0.0101]		[0.1197]
INTEREST					0.1459	0.0453
					0.1015	0.1125
					[0.1505]	[0.6873]
SURPLUS/GDP					-8.1770	-7.9732
					14.7061	16.0018
					[0.5782]	[0.6183]
Financial Variables						
PRIVATE/GDP	-0.0121	-0.0134	-0.0183			
	0.0041	0.0048	0.0052			
	[0.0033]	[0.0053]	[0.0004]			
CREDITGROWTH	-0.0040	-0.0031	-0.0065	-0.0042	-0.0119	-0.0314
	0.0018	0.0016	0.0029	0.0021	0.0094	0.0186
	[0.0316]	[0.0629]	[0.0275]	[0.0490]	[0.2065]	[0.0906]
CASH/BANK	-29.5790					
	14.6855					
	[0.0440]					
M2/RESERVES		0.0005	0.0009		0.0025	0.0043
		0.0010	0.0015		0.0039	0.0056
		[0.5930]	[0.5155]		[0.5142]	[0.4442]
Institutional Variables						
FOREIGNLAG	-0.0767	-0.0678	-0.0769	-0.0516	-0.0971	-0.1627
	0.0154	0.0185	0.0200	0.0146	0.0432	0.0806
	[0.0000]	[0.0002]	[0.0001]	[0.0004]	[0.0246]	[0.0437]
BANKREFORM		0.0666	-0.6647			
		0.8746	0.9893			
		[0.9392]	[0.5017]			
Number of observations	124	124	124	124	64	64
Number of Countries	11	11	11	11	7	7
Log likelihood	-23.813	-25.421	-16.545	-24.859	-9.610	-7.797
AIC	28.8	31.4	24.5	29.8	16.6	15.7

Note: Coefficient estimations are in bold-faces; standard deviations are in italic forms; p-values are in brackets.

Table 4

Marginal Effects

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Macroeconomic Variables						
GROWTH	-0.042	-0.0349	0.0269	0.0030	0.0574	0.0905
INFLATION			0.0214	0.0147	0.0127	-0.0367
DEPRECIATION			0.0203	0.0136	0.0365	0.0288
INTEREST						0.0113
SURPLUS/GDP					-2.0442	-1.9933
Financial Variables						
PRIVATE/GDP	-0.003	-0.0033	-0.0045			
CREDITGROWTH	-0.001	-0.0007	-0.0016	-0.0010	-0.0029	
CASH/BANK	-7.394				0.0006	-0.0078
M2/RESERVES		0.0001	0.0002			0.0010
Institutional Variables						
FOREIGNLAG	-0.019	-0.0169	-0.0192	-0.0129	-0.0242	-0.0406
BANKREFORM		0.0166	-0.1661			

As shown by results in Table 3, GDP growth, inflation and depreciation variables are significant in some specifications. In regard to financial variables, while the ratio of M2 to reserves is not significant in all specifications, the ratio of domestic credit to the private sector to GDP and the ratio of bank liquid reserves to bank assets variables are significant in all models including these particular variables. On the other hand, the rate of growth of real domestic credit is significant in some specifications.

The coefficient of the banking sector reform variable is insignificant in all models including this particular variable. Foreign bank participation variable has a significant and negative sign in all specifications. Thus, the presence of foreign banks appears to reduce the incidence of banking crisis. In terms of marginal effects, a one percentage point increase in foreign bank participation reduces the probability of banking crises in transition economies, at least by 1.29 percent and at most by 4.06, depending on the model examined. This result may be taken as evidence that the presence of foreign banks is preferable from the point of view of minimizing banking sector fragility.

We have also estimated the model using the full sample but without fixed effects (pooled logit regression model) to confirm the robustness of our findings. The results remain the same. These results are available upon request.

V. CONCLUSION

Using a multivariate fixed effect logit econometric model and taking possible endogenity problem into account, we test the hypothesis that foreign bank participation contributes to decrease in banking crises in transition economies in 1990-2006. The sample includes 26 transition economies and the data is unbalanced. The obtained results proved to be robust to different model specifications, demonstrating that there is a negative relation between foreign bank presence and banking crisis in a country during the estimation period. Thus, the results suggest that foreign bank participation decreases the possibility of banking crises in transition economies, controlling for other factors that may cause banking crises.

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PARTICIPACIJA STRANIH BANAKA I BANKARSKE KRIZE U TRANZICIJSKIM GOSPODARSTVIMA

SAŽETAK

Koristeći multivarijatni panelni logit ekonometrijski model s fiksnim učinkom i uzimajući u obzir mogući problem endogenosti, testirali smo hipotezu da participacija stranih banaka doprinosi smanjenju bankarskih kriza u tranzicijskim gospodarstvima u periodu od 1990-2006. Rezultati ukazuju na to da participacija stranih banaka umanjuje mogućnost za bankarske krize kontrolirajući ostale faktore koji takve krize mogu uzrokovati. Ovaj rad doprinosi literaturi tako što predstavlja prve empirijske dokaze negativnog odnosa stvarne razine prisustva stranih banaka (koncentracije stranih banaka) i bankarskih kriza u tranzicijskim gospodarstvima.

***Ključne riječi**: financijske krize, banke, struktura kapitala i vlasništva, tranzicijska gospodarstva, panel istraživanje*