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# Does business networking boost firms' external financing opportunities? Evidence from Central and Eastern Europe

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This article argues that networked firms are likely to have an advantage in securing bank finance in countries with weak legal and judicial institutions since it helps banks and other financial institutions to minimize the underlying agency costs of lending. An analysis of recent Business Environment and Enterprise Performance Survey (BEEPS) data from 15 Central and Eastern European (CEE) countries lends some support to this hypothesis. Even after controlling for other factors, firms affiliated to Business Associations (BA) are more likely to secure bank finance. Further, the importance of business networking is particularly evident among firms who borrow from private domestic banks, as these new banks attempt to minimize costs of adverse selection. There is also some confirmation that the significance of networking disappears with improvement in institutional quality.

**Keywords:** business networks; agency costs; external firm financing; bank loans; transition economies; endogeneity

**JEL Classification:** G21; G30; L14; M20; P31

## I. Introduction

Problems of contract enforcement are common in countries with weak institutions because there is no guarantee that contractual obligations will be upheld by the local institutions. Networks and informal relationships may thus emerge to facilitate functioning of many organizations in transition and emerging economies with weak legal and judicial institutions (e.g. Kandori, 1992; Boisot and Child, 1996; Guiso *et al.*, 2004; Grief, 2006; Ayyagari *et al.*, 2010).

In this context, this article examines the role of firms' affiliation to business networks on access to bank loans and other external corporate financing opportunities.

Recent empirical studies in the organizational behaviour literature (e.g. Boisot and Child, 1996) suggest that informal networks are often a response to inadequate institutional support. These networks usually involve an exchange of favours, making businesses easier for the members. While exchange within the networks does not rely on explicit written

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contracts, relationships between the members are guided by norms/conventions. Norms are nothing but the desirable behaviour subject to sanctions in a community (Kandori, 1992). Duvanova (2007) argues that prevalent corruption and bureaucratic pressure on businesses in post-communist societies may encourage collective action to combat corruption, especially when a single firm is no longer able to carry the burden of high bureaucratic corruption. By organizing in associations, firms can better protect themselves from corrupt officials, as Business Associations (BAs) become a medium of coordination, information transfer and representation. We go beyond this literature to argue that BAs may help affiliated firms to access external financing, especially when there is corruption and weak legal and judicial institutions as well as weak enforcement of laws. This is because the weak legal/judicial structure that guarantees written contracts and private property may render difficult credit enforcement. Accordingly, our first hypothesis is that a firm's affiliation to a BA could enhance its external financing opportunities in general and bank finance in particular. Possible causes of this link would include, among others, the following: first, the adverse selection problems of screening potential borrowers are alleviated if a firm belongs to a BA as it may allow a lender to obtain information regarding a firm's creditworthiness at lower costs than otherwise. In other words, networking may lower the information asymmetry between the lender and borrower. A further possibility would be that BAs explicitly monitor their members and ensure better repayment for banks, thus alleviating the moral hazard problems of contract enforcement. It, however, seems unlikely that BAs in our sample countries do explicitly perform this monitoring/supervisory role (see further discussion in Section II). It could still be the case that a firm's affiliation to a BA could minimize the potential moral hazard problems of strategic default because of the reputation factor within a close-knit business network. Clearly, the need for networking is greater in countries with weak institutions<sup>1</sup> and as such, the quality of institutions plays an important role in the analysis of business networking in this article. A second and a related hypothesis is therefore to examine whether the role of business networks vanishes when institutional quality improves over time.

Our analysis focuses on a group of Central and Eastern European (CEE) countries, which constitute an important case in this article. Even after a decade of reform, there is an increasing feeling that the reforms have failed to spur adequately the development of banking in the CEE countries. Despite widespread reforms, the use of external finance remains rather limited (only 20% of our sample firms had access to some bank finance), even by the standard of other developing and emerging economies. Further, among those firms with outstanding bank loans, many tend to have very high, potentially excessive, leverage (Coricelli *et al.*, 2012). This necessitates a further investigation of firms' external financing opportunities in the region. In this respect, this article highlights the role of firms' affiliations to business networks.

The analysis is developed in two steps. We primarily use 2005 European Bank for Reconstruction and Development (EBRD) Business Environment and Enterprise Performance Survey (BEEPS) data to test our central hypotheses, distinguishing between internal finance, bank finance, nonbank finance and equity finance. While a test of our first hypothesis pertains to the sign and significance of firm's affiliation to a BA, a test of our second hypothesis requires us to include an interaction term between firm's BA membership and country's institutional quality. Since there is limited time variation in institutional quality for the 3-year period 2002–2005, we can only exploit cross-country variation in institutional quality to test the validity of the second hypothesis in our sample.

Note, however, that a firm's affiliation to a business network is unlikely to be exogenous as networked firms are unlikely to be a random sample of all sample firms. Hence, one needs to correct for the underlying estimation bias arising from this selection issue. We adopt two possible approaches: first, we obtain the predicted value of BA membership using a first-stage regression (with some exclusion restrictions; see further discussion in the Section 'Addressing possible endogeneity of firm's affiliation to business networks') and use this as a potentially exogenous instrument for firm's access to any external financing. Second, BEEPS data have a small panel element where a small fraction of sample firms were interviewed in both 2002 and 2005 (see further discussion in Section III). This allows us to use 2002 and 2005 BEEPS panel data to obtain OLS fixed

<sup>1</sup> Recent literature highlights the importance of legal and institutional structures to enforcing contracts and safeguarding shareholders' and creditors' rights, thus promoting financial and economic development. In particular, La Porta *et al.* (1997) suggest that the legal environment matters for the size and the extent of a country's capital market. Demirguc-Kunt and Maksimovic (1998) argued that a developed financial system and a stronger rule of law help relaxing firms' external financing constraints, which in turn facilitates their growth. Beck *et al.* (2002) showed that, firms that operate in countries with underdeveloped financial and legal systems and higher levels of corruption tend to be more constrained than others.

effects estimates; we were, however, unable to include recently released 2008 BEEPS data in the panel analysis as 2008 round of BEEPS does not provide information on firm's affiliation to BAs. Use of the panel component allows us to exploit variation in firm's access to external finance over the period (2002–2005) to identify a causal effect of networking on firms' financing opportunities. We also test the robustness of our results by examining the role of business networking (*vis-à-vis* the two hypotheses of interest) on firm's access to loans from state, private domestic and foreign banks. The latter also allows us to explore the evidence of firm–bank ownership matching, if any. This is an important exercise because ownership matching between firms and banks may help reduce costs related to adverse selection in bank lending (e.g. see Berger *et al.*, 2006), especially in countries with weak institutions.

There is evidence from our analysis that, *ceteris paribus*, business networking plays a significant role on the probability of securing bank finance, especially from newly formed private domestic banks. We argue that the latter can be attributed to these new banks' attempts to trade cautiously in an uncertain business environment in countries with weak institutions. The result holds in both cross-section and panel estimates. Second, there is some support to our second hypothesis (from panel data analysis only) that the significance of the BA affiliation vanishes for bank finance, as institutional quality improves. Further, younger Small- and Medium-sized Enterprises (SMEs) are less likely to be networked and are also less likely to have access to various external finances in our sample. In other words, the lack of business networking in these post-communist societies may force SMEs to rely more on internal finance, thus hindering the process of corporate growth in the region.

The article contributes to a limited but growing literature on corporate financing in emerging economies. There is generally a consensus in the literature that business networks are a feature of the organizational landscape of many countries though their nature and effects may vary across the world. Kali (1999) argued that these networks absorb honest individuals and raise the density of dishonest individuals engaged in anonymous market exchange, which in turn may harm public interest. Consequently, the payoff from market exchange may diminish. Along similar lines, Khawaja and Mian (2009) found that political firms borrow 45% more and also have 50% higher default rates in Pakistan between 1996 and 2002, and this preferential treatment of political firms largely occur in state banks in the country. In a slightly different context, Hung *et al.* (2012) highlights the importance of

political connections for determining Chinese state-owned enterprises' decision to list in Hong Kong. In contrast, cross-country studies on social capital and economic growth (e.g. see, Knack and Keefer, 1997; Whiteley, 2000) have generally highlighted the positive impact of active membership in social organization to economic growth. Contrasting findings from these two strands of the literature thus motivates our analysis for the emerging economies of CEE. While there is a growing literature on corporate financing in the CEE region (e.g. see, Fries and Taci, 2002; Klapper *et al.*, 2002; De Haas *et al.*, 2007) and also some literature highlighting the effect of the lack of social capital in the transition region (e.g. see, Raiser, 1999; Paldam and Svendsen, 2000, 2001) on economic development and growth in the region, we are not aware of any study that analyses the role of business networks on firm external financing opportunities in the transition region. We integrate various strands of the existing literature, one on corporate finance and the second on social capital and economic development, to examine the effect of business networks on corporate financing opportunities in the CEE region.

It is an important exercise because it allows us to identify a possible micro-economic mechanism through which business networking can influence corporate financial opportunities in the region. Further results from our analysis highlight the inefficiency caused by business networking, distinguishing it from the advantages of social networking highlighted in the existing literature on social capital. Given that these countries are undergoing radical institutional restructuring, it is important that the informal institutions (e.g. some business networks) remain compatible with the formal institutions so as to minimize the possible costs of corruption and tax evasion and boost economic growth in the region. We thus hope that this research will inform policy makers to take steps to ease SME's access to external corporate financing opportunities from newly privatized banks (domestic or foreign). However, BEEPS data does not have information on earnings before interest or taxes. It only asks firms whether a profit was made in the last year and unfortunately the information was missing for a very large proportion of our sample firms. Hence, we were unable to examine the effect of firm's affiliation to business networks on profitability. We hope future research will address this.

This article is organized as follows. Section II explains the data and hypotheses while Section III develops the empirical methodology. Section IV analyses the results and the final section concludes this article.

**Table 1. Distribution of firms across sample countries**

Country	Number of firms	% of firms with BA membership	EBRD bank reform index <sup>a</sup>	Competition policy index <sup>a</sup>	Institutional quality index <sup>b</sup>
FYR Macedonia	200	41.00	2.7	2.0	-3.3
Serbia and Montenegro	300	58.00	2.7	1.0	0.0
Albania	204	88.00	2.7	2.0	-7.1
Croatia	236	82.00	4.0	2.3	0.3
Bosnia-Herzegovina	200	52.00	2.7	1.0	-9.9
Slovenia	223	91.00	3.3	2.7	8.5
Poland	975	30.00	3.7	3.3	7.0
Hungary	610	54.00	4.0	3.3	8.7
Czech rep	343	21.00	4.0	3.0	6.8
Slovak rep	220	34.00	3.7	3.3	2.8
Romania	600	54.00	3.0	2.3	-0.8
Bulgaria	300	43.00	3.7	2.7	0.1
Latvia	205	26.00	3.7	3.0	2.6
Lithuania	205	32.00	3.7	3.3	2.6
Estonia	219	48.00	4.0	3.3	6.1
Total	5040	n/a	-	-	-

Notes: <sup>a</sup>The EBRD bank reform and competition policy indices (Source: EBRD, 2009) range between 0 (minimum) and 4+ (maximum). The reform index captures the level of advancement of banking sector restructuring activities in CEE countries, while the competition policy index measures how fair the business environment is in CEE countries in promoting healthy competition between enterprises.

<sup>b</sup>Institutional quality index is obtained from Bacchetta and Drabek (2002), which is a composite index capturing the strength of a country's government to provide the infrastructure to promote a conducive environment for business growth and development and comprises five component indicators – Government effectiveness, Regulatory burden, Rule of law, graft and extent of democracy (voice and accountability). The index ranges from -25 to 25, with higher values depicting countries with higher institutional quality.

## II. Data

Our analysis is primarily based on the 2005 EBRD BEEPS data. BEEPS is a joint initiative of the EBRD and the World Bank Group. The survey was administered to a random sample of 11 814 enterprises in 28 countries of CEE, including Turkey and the Commonwealth of Independent States (CIS), to examine the quality of the business environment (as determined by a wide range of interactions between firms and the state), to assess the environment for private enterprise and business development. For further details of the data, see EBRD (2005). For one particular section of our analysis, we also make use of the panel element of 2002 and 2005 BEEPS data though the size of the sample is relatively smaller in this case (see Sections 'Addressing possible endogeneity of firm's affiliation to business networks' and 'Fixed effects panel logit estimates of firm financing choice').

### Sample countries

For the purpose of our study, we create a sub-sample comprising only of firms in the CEE countries – Macedonia, Serbia and Montenegro, Albania,

Croatia, Bosnia and Herzegovina, Slovenia, Poland, Hungary, Czech Republic, Slovakia, Romania, Bulgaria, Latvia, Lithuania and Estonia. This gave rise to a sample of 5040 firms, representing about 52% of all firms that participated in the 2005 BEEPS survey. The country distribution of our sample of firms suggests that Polish firms represent the largest group followed by Hungary, Romania and Czech Republic in that order (Table 1).

### Descriptive statistics

BEEPS data provides information on whether a firm is affiliated to any BA, which plays a significant role in our analysis. Table 1 summarizes the proportion of firms affiliated to BA in the sample countries, which clearly highlights the aspect of pronounced inter-country variation. While Czech Republic has only 21% affiliated firms in our sample, the proportion rises to as high as 91% in Slovenia closely followed by 88% in Albania. Note that the nature of most BAs in the Balkan countries like Slovenia, Albania, Croatia, Serbia and Montenegro are likely to be different from those in other countries in the CEE region. The model of business representation in the Balkan countries was adapted from the 'continental' chamber

**Table 2. Distribution of firms reliance on a single source of finance for new investment**

Country	Source of finance (%)					Total
	Internal	Bank	Nonbank	Equity	Other	
FYR Macedonia	35.00	4.50	0.00	1.00	7.50	200
Serbia and Montenegro	47.33	3.33	1.00	0.67	2.33	300
Albania	52.94	5.39	0.00	0.00	0.49	204
Croatia	28.81	8.47	1.69	1.27	0.85	236
Bosnia and Herzegovina	27.50	7.00	0.00	0.00	1.00	200
Slovenia	28.70	4.48	0.90	0.00	2.24	223
Poland	48.41	2.36	1.23	0.10	2.36	975
Hungary	31.15	6.07	2.79	7.54	0.98	610
Czech rep	32.94	3.21	4.96	3.21	11.08	343
Slovak rep	34.09	3.64	3.64	4.55	2.27	220
Romania	46.00	5.50	1.83	0.17	2.17	600
Bulgaria	40.00	7.33	2.67	0.00	2.00	300
Latvia	22.44	5.37	1.95	8.78	3.41	205
Lithuania	36.59	3.41	11.71	1.95	2.44	205
Estonia	31.05	1.83	1.83	0.91	1.37	219

*Notes:* The table shows the distribution of firm's financing across sample countries. In particular, here we consider the firms' reliance on a single source of financing for new investment. Each cell refers to the proportion of firms financed solely by internal finance, bank finance, nonbank finance, equity finance and other in respective sample countries. Note that proportions will not add up to 100% in all countries as not all firms will use 100% of any type of finance in sample countries. Clearly, a high proportion of sample firms rely solely on internal finance; in comparison, very few firms are financed solely by bank finance.

systems in the sense of being based on compulsory membership upon the official incorporation of an enterprise or the licensing of entrepreneurial activity. Note, however, that BA membership is compulsory only for certain sectors and these sectors may vary from one Balkan country to another (Duvanova, 2007); the latter explains why despite compulsory BA membership in the Balkan countries, our sample does not show 100% membership of BA in the region. Nevertheless, compared to other sample countries, BA membership would, in general, be much higher in the Balkan region in our sample. In an attempt to capture this regional variation in the BA membership, we create a Balkan dummy that takes a value 1 for the subsample Balkan countries, namely Albania, Bosnia-Herzegovina, Croatia, Macedonia, Serbia and Montenegro and Slovenia, and is zero otherwise. In other words, inclusion of the Balkan dummy allows us to distinguish the effect of compulsory membership from the voluntary membership in our analysis that follows.

Our data also allow us to identify the ways a networked firm may benefit from their affiliation to the BA. The list includes lobbying the government (82.5% of networked firms in our sample), resolving disputes (83.5% of networked firms), information on domestic/international product and input markets (about 90% firms), accrediting quality standards of the product (89% of networked firms) and getting information on government regulation (about 91% of

networked firms). The latter in turn suggests that the BA membership variable is likely to be endogenous to firm financing, especially when the particular BAs provide networking-type services (e.g. 'information or contacts on domestic markets').

Our analysis solely considers firm financing for new investment, which funds future growth opportunities. In the BEEPS survey, firm managers were asked to provide information on sources of finance including internal funds/retained earnings, equity, private domestic commercial bank borrowing, foreign bank borrowing, state-owned bank borrowing (including state development banks), loans from family/friends, money lenders or other informal sources, trade credit from suppliers, trade credit from customers, credit cards, leasing arrangement, the Government (other than state-owned banks) and other for new investments (i.e. new land, buildings, machinery, equipment). We aggregate the available information to create four categories of financing sources: internal finance, bank finance (when firm obtains loans from any bank, private domestic commercial, state or foreign), equity finance and any nonbank finance; the latter refers to trade credit from suppliers or customers, credit cards and leasing arrangement. Thus, external sources of financing in our sample refer to bank loans, equity financing or any type of nonbank financing. Note, however, that some firms tend to obtain financing from more than one source (internal, external or both). Accordingly, Table 2

**Table 3. Comparison of networked and nonnetworked firms**

Firm characteristic	Number of firms	Networked firms	Nonnetworked	<i>t</i> -statistics
SME	5040	0.8419	0.9631	-14.569***
Young	5034	0.3428	0.4934	-10.954***
Private	5040	0.7227	0.8291	-9.069***
State	4906	0.1065	0.0666	4.945***
Foreign	5040	0.0864	0.0377	7.129***
Growth of fixed assets	4883	127.53	31.34	4.837***
Research and development spending	3163	46.5764	10.4931	5.664***
Exports	5027	0.4008	0.2167	14.324***
International Accounting Standards (IAS)	5040	0.2752	0.1148	14.577***

*Notes:* The table summarizes the independent sample means test of selected firm characteristics for networked firms and nonnetworked firms. *t*-statistics are computed assuming nonequality of means between networked and nonnetworked firms. A negative and significant *t*-statistic indicates that networked firms tend to have a significantly lower average of the particular firm characteristic compared to nonnetworked firms and the opposite holds for positive *t*-statistic.

\*\*\*denotes significance at the 1% level.

shows the proportion of firms relying *solely* on any type of internal or external financing. Clearly, reliance on external financing is rather limited in our sample as a significant proportion of firms rely solely on internal finance. In fact, about 39% sample firms relied only on internal finance for new investment in 2005 in all countries taken together. Reliance on equity funding is rather limited as equity markets continue to be rather under-developed in these countries. A small proportion (1%–12%) of firms relied solely on bank or equity financing or trade credit.

While Bonin and Leven (1996) argued that foreign banks may choose those domestic firms who have previously established some international links by virtue of their import/export activities, others have focused on banks' preference to serve large firms with more transparent accounting standards. In this respect, a comparison between networked and non-networked firms is informative. Using firms' BA membership, we could classify firms into networked and other nonnetworked firms. Table 3 compares selected characteristics of networked and nonnetworked firms. In general, older state firms and also foreign firms are significantly more likely to be networked, while young SMEs in the private domestic sector are significantly less likely to be networked. In addition, compared to nonnetworked firms, networked firms are more likely to be involved in the export sector and 68% of networked firms tend to use international accounting standards. Thus, networked firms appear to be in a more advantageous position than other nonnetworked firms. Accounting for BA membership thus allows us to identify the mechanism through which some domestic firms may overcome the domestic barriers of weak institutions and local practices. However, we cannot compare profitability

of these two groups of firms as this information is not contained in the BEEPS data.

Finally, using the identity of the largest owner, we classify firms by ownership structure: (a) state, when the largest shareholder is government or government agency; (b) private domestic, when the largest shareholder is individual/family, general public and domestic company; (c) foreign, when the largest shareholder is a foreign company. In a similar fashion, we classify the banks lending to the sample firms as state, private domestic commercial and foreign. Table 4 cross-tabulates the ownership structure of firms and banks providing loans to the sample firms. Of the firms that borrow from banks, borrowing from private domestic commercial banks is most common, irrespective of the firm ownership type (state-owned, foreign-owned or private domestically owned). There also seems to be some firm-bank ownership matching, as private domestic firms are more likely to use private domestic commercial banks. Note that the borrowing from state-banks is not so common in 2005; but again, relatively higher proportion of state-owned firms borrows from state banks. EBRD report (2006) suggests a form of bank-firm matching between large firms and foreign banks in a selected number of transition countries. Later we would explore if firm-bank ownership matching holds, after controlling for all other factors.

#### *Institutional quality*

In CEE as well as the Baltic countries, privatization and institutional reform in the banking sector have advanced in step with the state's withdrawal from the direct provision of banking services and with progress in enterprise reform. Shleifer (1997) argues that there

**Table 4. Firms' choice of banks (by ownership type)**

Loans from	Firm ownership <sup>a</sup>		
	State-owned	Private domestic <sup>b</sup>	Foreign
State bank (1)	12 (23.53%)	133 (15.93%)	7 (9.33%)
Private domestic commercial bank (2)	34 (66.67%)	598 (71.62%)	48 (64.00%)
Foreign bank (3)	5 (9.80%)	104 (12.46%)	20 (26.67%)
Total	51	835	75

*Notes:* The table shows the sample firms' access to bank loans classified by bank ownership types: state banks, private domestic banks and private foreign banks. Figures in parentheses refer to the percentages of firms of a given ownership obtaining loans from state, private domestic and foreign banks. It is constructed from the BEEPS 2005 questions 45a17 to 45a19, which asked the respondents what proportion of their firm's new fixed investment has been financed by borrowing from private domestic commercial banks, borrowing from foreign banks and borrowing from state-owned banks (including state development banks).

has to be a transition of government for a transition to a market economy to take place. This was described as de-politicization of the economy, whereby control over resource use and ownership is transferred exclusively to the private sector. The role of the government will then be to provide the necessary institutions to support the market economy. This will necessitate not only the creation of laws and legal institutions that protect the private property and enforce contracts between private parties, but also to limit the ability of officials to prey on the private property.

Considering the sample countries, there is evidence of a wide dispersion in the institutional quality, bank reform and competition policy indices among the 15 countries in our sample (Table 1). The institutional quality index (Bacchetta and Drabek, 2002) is a composite index capturing the strength of a country's government to provide the infrastructure to promote a conducive environment for business growth and development and comprises of five component indicators – government effectiveness, regulatory burden, rule of law, graft and the extent of democracy (voice and accountability). The bank reform index constructed by EBRD captures the level of advancement of banking sector restructuring activities in the CEE countries, while the competition policy index measures how fair the business environment is in the CEE countries in promoting healthy competition between enterprises.

It follows from Table 1 that our sample CEE countries are at very different levels of reform and there is a bimodal distribution. Many CEE countries still have a considerable way to reach the international levels. This is particularly true for the Balkan countries like FYR Macedonia, Bosnia and Herzegovina, Serbia and Montenegro, and Albania, many of which have a negative institutional

quality index. At the other end of the distribution, the country with the best institutions was Hungary at 8.7, closely followed by Slovenia, Poland, Czech Republic and Estonia, respectively. Only one-quarter of the countries actually attained the highest value of the EBRD bank reform index, including Croatia, Hungary, Czech Republic and Estonia. In terms of the competition policy, only five countries, namely, Poland, Hungary, Slovak Republic, Lithuania and Estonia, actually attained the highest level of competition policy reform. We exploit this cross-country variation in institutional quality indices to explore the validity of our second hypothesis.

### III. Methodology

This section develops the empirical model to test the two hypotheses of interest with respect to firms' financing opportunities, distinguishing between internal finance, bank finance, nonbank finance and equity finance. In each of these cases, we test the validity of the two null hypotheses:

**H10:** Business association membership has no effect on firms' financing mode.

**H20:** Business association membership has no effect on firms' financing mode in countries with stronger institutions.

The alternative hypothesis in each case would be that there exists a positive effect of BA membership. We test the validity of our hypotheses for firm's financing choice by controlling for all other factors that may influence financing choice. We also examine the robustness of our estimates by comparing pooled (with and without instrument for BA membership) and panel estimates. Further, we consider the validity

of these hypotheses for firms' choice of state, private domestic and foreign banks.

#### An empirical model of firm financing choices

In this subsection, we specify the empirical model to analyse firm's financing choices for new investment. As indicated in Section II, firms may use different sources of finance including internal finance, bank or equity finance or nonbank credit. While a significant proportion of firms rely on internal finance only, many firms tend to combine internal and various sources of external financing (bank loans, equity and other nonbank sources). Accordingly, we first define a variable  $IF_{ic}$ , which takes a value 1 if the  $i$ -th firm in country  $c$  relies 100% on internal finance and zero otherwise. Suppose the underlying unobserved variable  $IF_{ic}^*$  is given by

$$IF_{ic}^* = \alpha_0 + \alpha_{BA}BA_{ic} + \alpha_{IQ}IQ_c + \alpha_{BAIQ}BA_{ic} * IQ_c + \alpha_x X_{ic} + \varepsilon_i \quad (1)$$

where  $\varepsilon$  is distributed with mean 0 and variance 1,  $i=1, \dots, N$  refers to the sample firms, while  $c=1, \dots, 12$  refers to the sample countries. While  $BA$  refers to  $i$ -th firm's affiliation to a BA in  $c$ -th country,  $IQ$  refers to the institutional quality index in the  $c$ -th country. We prefer to use a composite institutional quality index that would enable us to solve the problem of multicollinearity that would have resulted had we used individual country level indices. We also include an interaction between  $BA$  and  $IQ$ .  $X$  refers to all firm-specific control variables (please see below for the exact model specification). What we observe is  $IF_{ic}$ , which is related to  $IF_{ic}^*$  as follows:

$$IF_{ic} = 1 \text{ if } IF_{ic}^* > 0 \\ = 0 \text{ if } IF_{ic}^* \leq 0$$

We use a binary logit model to determine the likelihood of 100% internal finance for new investment in our sample.

It is also important to analyse the factors determining various sources of external financing, namely, bank finance, equity finance and nonbank finance, where networking could play an important role. Accordingly, we create three more variables, which take the value of 1 if the  $i$ -th firm in country  $c$  uses any of the three sources of external finance, and zero otherwise, as follows:

$BF_{ic} = 1$  if the  $i$ -th firm in country  $c$  uses any bank finance;

$EF_{ic} = 1$  if the  $i$ -th firm in country  $c$  uses any equity finance;

$NBF_{ic} = 1$  if the  $i$ -th firm in country  $c$  uses any nonbank finance(as defined in Section II).

For a given choice of external finance ( $BF$ ,  $EF$  or  $NBF$ ), generally denoted by  $XF$  for any source of external finance, we estimate a binary logit model for each of the sources of external finance, namely,  $BF$ ,  $EF$  and  $NBF$ . As before, we assume that the underlying unobservable variable  $XF_i^*$  for the  $i$ -th firm is determined as follows:

$$XF_{ic}^* = \beta_0 + \beta_{BA}BA_{ic} + \beta_{IQ}IQ_c + \beta_{BAIQ}BA_{ic} * IQ_c + \beta_x X_{ic} + u_i \quad (2)$$

The observable variable

$$XF_{ic} = 1 \text{ if } XF_{ic}^* > 0 \text{ and } XF_{ic} = 0 \text{ otherwise}$$

As before, we assume that the random error term  $u$  is distributed with mean 0 and variance 1 and accordingly use a logit model to determine  $XF_i$  for each type of external financing choice, namely, any bank finance ( $BF$ ), equity finance ( $EF$ ) or nonbank finance ( $NBF$ ).

Since the logit coefficient estimates do not reflect the marginal effects of explanatory variables, we determine the marginal effect separately as the partial derivative of the expected value of the dependent variable with respect to the particular explanatory variable in the estimation of both Equations 1 and 2.

After controlling for all other factors, an empirical test of hypothesis H10 pertains to the sign and significance of the coefficient estimates of  $BA$  separately for internal finance ( $IF$ ), bank finance ( $BF$ ), equity finance ( $EF$ ) and nonbank finance ( $NBF$ ). While a number of studies on banking relationships (e.g. Kali, 1999; Ghatak and Kali, 2001) have recognized the importance of  $BA$  membership, we are not aware of any prior study that highlights the role of networking for firms' financing opportunities. Further, we examine the validity of our second hypothesis by considering the sign and significance of the estimated coefficient of the interaction term between firms'  $BA$  membership and country's institutional quality.

We follow the existing literature to choose other firm-specific control variables,  $X$ , in each case for estimating Equations 1 and 2. The ownership structure of firms (i.e. domestic, foreign) is likely to play an important role, especially in the context of networking in an imperfect world (see, e.g. Detriagache *et al.*, 2000; Berger *et al.*, 2006). To this end, we include controls for state-owned firms, private domestic firms and foreign firms.

Following the introduction of the transition process in the early 1990s, there has been a significant



increase in the share of SMEs in the CEE countries; the latter could be attributed to the break-up of large state-owned enterprises during the transition. While other studies have used the log of sales (see, e.g. Bevan and Danbolt, 2004) and natural logarithm of the book value of the total property assets (e.g. Ooi, 2000), we use the firm size defined by the labour force size information adopted by the BEEPS data at our disposal. In particular, BEEPS data-set classifies firms into three categories, namely, 'small', 'medium' and 'large' as follows:

Small-sized firm: Employee size 1–49

Medium-sized firm: Employee size 50–249

Large-sized firm: Employee size 250–9999

We merge small- and medium-sized firms together and label them as SMEs. About 91% of sample firms are SMEs. We have chosen to focus on SMEs because they have been targeted not only by the government (Smallbone and Welter, 2001) but also by the EBRD, as they generally struggle to raise external finance in the region. Incidentally, similar classification is used by Erbas *et al.* (2008), Kounouwewa and Chao (2011) and Zhu (2012) among others.

It is also important to identify the newly established firms from the rest. Following Klapper *et al.* (2002) and Ayyagari *et al.* (2011), firms with an age of 10 years or less, i.e. those that came into existence after the year 1995, were defined as 'young'. 49% of small firms in our sample fall into the category of young firms. Both the firm size and age are observed to determine a firm's choice of finance. This is confirmed by Klapper *et al.* (2002), Berger *et al.* (1995) and Beck *et al.* (2002).

Other control variables include the growth of fixed assets, prior year research and development spending. Note, however, that BEEPS data do not provide information on earnings before interest and taxes, which is the basis of calculating profitability; we only observe whether a firm is making any profit or not (as a binary variable) and as such we could not control for firm profitability. However, given that there is a close correlation between the size and profitability, we hope that to some extent the firm size would control for profitability. Further, estimation of the fixed effects panel data model would control for firm-specific omitted factors (see discussion in Sections 'Addressing possible endogeneity of firm's affiliation to business networks' and 'Fixed effects panel logit estimates of firm financing choice').

Finally, given that firm's membership of a BA is likely to be significantly higher in most Balkan countries in our sample, we include a binary variable *Balkan* indicating whether the firm is located in a Balkan country. The variable takes a value

zero otherwise. We also combine firm's BA membership with the Balkan dummy to explore the differential effect of BA membership in the Balkan countries (relative to other sample countries), if any. Since the Balkan countries on average tend to have weaker institutional quality, the significance of this interaction term allows us to examine the link between business networks and institutional quality as well.

#### *Addressing possible endogeneity of firm's affiliation to business networks*

A potential problem with the estimation of Equations 1–2 using a BA membership variable, *BA*, as one of the explanatory variables is that firms' affiliation to a business network is likely to be endogenous. This is because firms may choose to belong to a network with a view to facilitate its financing access (see discussion in Section II); thus networked firms are unlikely to be random among all sample firms. Accordingly, there remains an important selection bias that we need to address here. One possibility would be to generate an instrument for firm's affiliation to a business network. To this end, we first use a logit model to determine sample firm's affiliation to a business network. In this respect, our choice of explanatory variables has largely been guided by the results from Table 3; in particular, we include if the firm is an SME, young, state, private or foreign-owned and also if the firm is located in one of the Balkan countries. However, it is important to ensure some exclusion restriction for the estimation of the selection equation (pertaining to BA membership) with a view to minimize any bias while estimating firm financing equations (1) and (2) at the second stage. In particular, we argue that unlike firms' financing opportunities, growth of fixed assets and research and development spending are not pertinent in the determination of first-stage BA membership equation so that they are excluded from the first-stage regression. Further we include a sector control, namely, if a firm is involved in export sector in determining firm's membership of BA, which is not included in Equations 1 and 2.

Logit marginal effect estimates of BA membership, as shown in Table 5, highlight that the likelihood of business networking is significantly higher among foreign firms, exporting firms and also those from the Balkan countries, while it is lower for younger firms and also for SMEs. Using these logit estimates of BA membership, we then generate the fitted value of BA membership as an instrument for firms' actual BA membership, which is, in turn, to be used in estimating firms' financing opportunities (Equations 1 and 2) at the second stage.

**Table 5. Logit marginal effects estimates of BA affiliation**

Dependent variable	BA
State firm	-0.0517 (0.0700)
Foreign firm	0.157** (0.0667)
Private domestic firm	-0.0251 (0.0523)
SMEs	-0.310*** (0.0369)
Young firm	-0.133*** (0.0228)
Exporting firm	0.145*** (0.0244)
Balkan country	0.358*** (0.0221)
Number of observations	2365
Log-likelihood	-1426.54
Likelihood ratio Chi-square (7)	327.88***

*Notes:* The table reports the first-stage pooled logit (marginal effects) regression estimates for firm's BA affiliation using 2005 BEEPS. All SEs are clustered at the firm level so as to minimize the problem of autocorrelation over the years. Robust SEs are shown in parentheses. \*\* and \*\*\* denote significance at the 5 and 1% levels, respectively.

Although we have tried to use convincing exclusion restrictions between the first-stage estimation of firms' business affiliation and the second-stage estimation of choice of financing mode, concerns may still arise about the validity of the exclusion restrictions in cross-section data-set that we have used so far. One possible alternative is to make use of the available panel information of sample firms for 2002 and 2005, although the latter considerably reduces the sample size (note that the 2-year BEEPS panel data corresponds to only about 15.35% of our total observations in BEEPS 2005). These are the firms initially surveyed in the BEEPS 2002 round and then were re-surveyed in BEEPS 2005, having expressed a desire to be involved in the 2005 BEEPS round. Note, however, that firms in Bosnia and Herzegovina, although surveyed in 2005, were either not surveyed in 2002 or refused to be involved in the BEEPS round of 2005 having participated in BEEPS 2002. The firms were identified through a firm identity number allocated to such firms in the BEEPS 2005 survey round. In particular, about 390 firms in 15 selected countries are included in this panel, giving rise to 780 observations in total for the considered 2 years (2002 and 2005). The underlying idea is that, *ceteris paribus*, variation in BA affiliation of firms over these 2 years, 2002 and 2005, would allow us to identify the causal effect of BA membership on firms' financing opportunities (Equations 1 and 2). We construct very similar

regression variables used in the cross-section analysis of Equations 1 and 2. Means and SDs of these variables are shown in the Appendix (Table A1), which generally highlight their comparability with 2005 data used in the cross-section analysis.

We use this panel data fixed effects logit model to determine  $i$ -th firm's financing choice (100% internal finance, bank finance, equity finance and nonbank finance) for new investment in the year  $t$ ,  $t=2002, 2005$ , in country  $c$ , in terms of business affiliation as one of the possible covariates  $X$ . We assume that the underlying unobserved variable  $Y_{ict}^*$  is determined by

$$Y_{ict}^* = \Psi_0 + \Psi_{BA}BA_{it} + \Psi_zIQ_{ct} + \Psi_{BAIQ}BA_{it} * IQ_{ct} + \Psi_xX_{it} + \Omega_i + e_{it} \quad (3)$$

such that

$$Y_{ict} = 1 \quad \text{if } Y_{ict}^* > 0$$

$$Y_{ict} = 0 \quad \text{otherwise}$$

In this respect, we choose four  $Y$ s pertaining to firm's financing choice of relying only on 100% internal finance, bank finance, equity finance and nonbank finance (each of them being a binary variable) and run four separate fixed effects logit models (see discussion in the Section 'Pooled and panel fixed effects estimates for firms' access to state, private domestic and foreign bank loans'). There are two error terms in the model – one firm-specific (time invariant)  $\Omega_i$  and the other  $e_{it}$  that varies not only across firms but also over time. The firm-specific fixed effects  $\Omega_i$ s allow us to control for firm-specific (time-invariant) unobserved variables, which in turn minimizes the estimation bias arising out of firm-level unobserved heterogeneity, thus justifying the use of the fixed effects logit model.

While we include similar explanatory variables in all fixed effects models captured by Equation 3, the time invariant factors are dropped from the estimation of fixed effects logit models. As before, in order to test the validity of our null hypotheses H10 and H20, we consider the sign and significance of the estimated coefficient of firm's BA membership and also its interaction with the institutional quality index.

#### IV. Results

This section presents and analyses our empirical results. We start with the pooled logit estimates of firm financing using the predicted value of BA (see the Section 'Pooled logit estimates of firm financing choices'). These estimates are summarized in Table 6. Table 7 augments the estimates of Table 6 by

Table 6. Pooled logit marginal effects of firms' financing opportunities

Dependent variable	(1)	(2)	(3)	(4)
	Internal finance	Bank finance	Nonbank finance	Equity finance
Predicted BA ( <i>BA</i> )	-0.038** (0.0182)	0.0719*** (0.0149)	-0.0431*** (0.0142)	-0.00955 (0.00667)
Institutional quality ( <i>IQ</i> )	0.0022 (0.00415)	-0.007* (0.00362)	-0.00590* (0.00308)	0.00311* (0.00188)
<i>BA X IQ</i>	-0.009** (0.00366)	0.008*** (0.00315)	0.00697*** (0.00271)	0.00155 (0.00129)
State firm	0.043 (0.0613)	-0.151*** (0.0323)	-0.0333 (0.0418)	-0.0271* (0.0158)
Foreign firm	0.103 (0.0629)	-0.114*** (0.0372)	0.0508 (0.0568)	-0.00856 (0.0224)
Private domestic firm	0.026 (0.0479)	-0.003 (0.0401)	-0.0160 (0.0390)	-0.0092 (0.0224)
Growth of fixed assets	-0.001*** (0.00046)	0.001*** (0.00031)	0.0005*** (0.0002)	-0.0003 (0.00013)
Research and development spending	-0.00003 (0.00006)	0.00007 (0.00005)	0.00001 (0.00003)	0.00002 (0.00001)
SMEs	0.034 (0.0529)	0.0196 (0.0408)	-0.126** (0.0535)	-0.0388 (0.0306)
Young firm	-0.085 (0.107)	-0.0507 (0.0800)	-0.0466 (0.0732)	0.0127 (0.0335)
SME * Young firm	0.0428 (0.110)	0.0460 (0.0859)	0.0310 (0.0797)	0.00134 (0.0328)
Competition policy	-0.0952*** (0.0300)	0.0488*** (0.0256)	0.0535** (0.0243)	0.0287** (0.0145)
Wald test of <i>BA</i> , <i>BA*IQ</i>	12.24***	37.19***	12.98***	2.44
McKelvey and Zavoina pseudo- $R^2$	0.0321	0.0739	0.0395	0.1688
Likelihood Chi-square (12)	49.66***	92.85***	41.74***	56.97***
Number of observations	2365	2365	2365	2365

Notes: SEs are clustered at the firm level. Robust SEs are shown in parentheses.

\*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively.

Table 7. Pooled logit marginal effects of firms' financing opportunities with Balkan dummy

Dependent variable	(1)	(2)	(3)	(4)
	100% Internal finance	Bank finance	Nonbank finance	Equity finance
Predicted BA ( <i>BA</i> )	-0.117*** (0.0407)	0.121*** (0.0335)	0.0502* (0.0303)	0.001 (0.0157)
Institutional quality ( <i>IQ</i> )	0.00290 (0.00417)	-0.0081** (0.00373)	-0.0066** (0.00315)	0.003 (0.00189)
<i>BA * Institutional quality</i>	-0.009*** (0.004)	0.01*** (0.003)	0.008*** (0.003)	0.002 (0.001)
Balkan	0.226*** (0.00703)	-0.187*** (0.0490)	-0.225*** (0.0396)	-0.0474 (0.0332)
Balkan country* <i>BA</i>	-0.0831 (0.0523)	0.151*** (0.0563)	0.163*** (0.0866)	0.055 (0.0871)
Wald test of joint significance of <i>BA</i> and <i>IQ</i>	16.61***	25.13***	11.18***	1.46
McKelvey and Zavoina pseudo- $R^2$	0.0359	0.0815	0.0663	0.188
Likelihood ratio Chi-square (14)	58.08***	106.09***	52.80	68.18
Number of observations	2365	2365	2365	2365

Notes: SEs are clustered at the firm level. Robust SEs are shown in parentheses.

\*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively. Other control variables are as in Table 6.

**Table 8. Fixed effects logit marginal effects of firms' financing opportunities**

	(1)	(2)	(3)	(4)
Variables	100% internal finance	Bank finance = 1	Nonbank finance = 1	Equity finance = 1
BA	-0.287 (0.241)	0.859*** (0.280)	-2.30*** (0.291)	-0.847 (1.000)
Institutional quality	0.143 (0.221)	-0.172 (0.285)	-0.611** (0.274)	-0.050*** (0.0102)
BA * Institutional quality	0.0591 (0.0416)	-0.0584 (0.0410)	0.0797* (0.0414)	0.0259 (0.183)
Growth of fixed assets	0.003 (0.003)	-0.005* (0.003)	0.005 (0.004)	-0.002 (0.010)
Firm fixed effects	Yes	Yes	Yes	Yes
LR Chi-square (4)	0.463	2.93**	16.47***	6.54***
Number of observations	298	234	622	60
Number of firms	149	117	311	30

Notes: The table makes use of the panel component of BEEPS 2002 and 2005 data. All SEs are clustered at firm level. Robust SEs are shown in parentheses.

\*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively.

including the Balkan dummy and also its interaction with the institutional quality variable. In this respect, we also compare the effect of instrumented BA variable with the corresponding un-instrumented estimates (see the Appendix). The Section 'Fixed effects panel logit estimates of firm financing choice' considers the fixed effects panel logit estimates of four firms' financing choices for new fixed investment (Table 8). Finally, the Section 'Pooled and panel fixed effects estimates for firms' access to state, private domestic and foreign bank loans' examines the robustness of our estimates by considering firms' choice of banks (state, private domestic and foreign) as functions of firms' BA membership. As with firms' financing choices, we consider both the pooled and panel fixed effects logit estimates. All SEs are clustered at the firm level with a view to reduce the correlation of errors over time.

#### *Pooled logit estimates of firm financing choices*

Table 6 summarizes the pooled logit estimates of firms' financing choices using the instrumented value of BA membership. Column 1 shows the logit marginal effects of the probability of firms relying solely on internal finance while columns 2-4 show the logit marginal effects of firm's reliance solely on bank finance, nonbank finance and equity finance, if any, respectively. All SEs are clustered at the firm level. We also show the McKelvey and Zavoina pseudo- $R^2$  for the model with the instrumented BA variable, which is defined as the proportion of the variance of

the latent variable that is explained by the covariates. In other words,

$$\begin{aligned} & \text{McKelvey and Zavoina pseudo-}R^2 \\ & = \text{Var}(y^*) / (\text{Var}(y^*) + \text{Var}(\text{error})) \end{aligned}$$

where  $y^*$  refers to the unobservable binary dependent variable (pertaining to internal or external financing choices as in Equations 1 and 2) and  $\text{Var}(\text{error})$  in the logit is assumed to be equal to  $(3.14)^{2/3}$ . This is a goodness-of-fit for the logistic model, which is based on a latent model structure. These pseudo- $R^2$  values justify the goodness-of-fit of the logit models using the instrumented BA variable. More importantly, the statistical significance of the likelihood ratio chi-squared statistic in each case confirms the joint significance of the covariates of these estimated models.

Given that the estimated logit coefficients do not reflect the marginal effects of our explanatory variables, we compute the marginal effects and report them in the table. This enables us to examine the magnitude of the marginal effect of each of the explanatory variables on the particular dependent variable in question.

Since a significant proportion of sample firms relied solely on internal finance, we estimated the determinants of the likelihood of relying solely on internal finance. It follows that firms affiliated to BAs are about four percentage points significantly less likely to rely fully on internal finance. While the institutional quality variable *per se* does not have any significant effect on the likelihood of relying on

internal finance, BA membership significantly boosts the marginal effect of internal firm financing when institutional quality improves (note that the interaction between the institutional quality and BA is positive and significant).

In view of our central hypothesis, we particularly focus on the logit estimates of the likelihood of relying on bank finance (see column 2). These estimates are generally consistent with our central hypothesis that affiliation to business networks significantly improves firms' access to external bank finance in our sample of emerging economies with weaker institutions. Firms from countries with better institutions tend to have less bank finance. However, the role of BA membership continues to significantly boost firm's reliance on bank finance even when the institutional quality improves.

As our central variable BA membership is a dummy variable taking the values of 1 and 0, we need to be careful in interpreting its reported marginal effect on the likelihood of any given kind of firms' financing choice. In particular, for given values of all other exogenous variables, the marginal effect of BA membership of a firm needs to be interpreted relative to nonmembership of BA. Further caution needs to be taken while interpreting the estimates of the interaction term, BA membership and institutional quality. Hence, from Equation 2, we calculate the total marginal effect of BA membership for bank finance as follows:

$$dBF_{ic}^*/dBA_{ic} = \beta_{BA} + \beta_{BAIQ} * IQ_c$$

Table 6 suggests that  $\beta_{BA} = 0.0719$  when  $\beta_{BAIQ} = 0.008$ , while the institutional quality index ranges between  $-9.9$  (Bosnia and Herzegovina) and  $8.5$  (Estonia). Thus for Estonia, the country with the highest institutional quality index of  $8.5$  (Table 4), the likelihood of relying on any bank finance is significantly higher for networked (relative to nonnetworked) firms by about  $0.1399$  or about  $14$  percentage points. In contrast, for a country like Bosnia and Herzegovina, which has the lowest institutional quality index of  $-9.9$ , the interaction effect ( $\beta_{BAIQ} * IQ_c$ ) outweighs the direct effect of BA membership ( $\beta_{BA}$ ) and the total effect of networking turns out to be  $-0.0073$ ; in other words, a networked firm does not gain positively from networking in this case as the institutional quality is so weak. In this context, it is also important to compare the instrumented marginal effects estimates with un-instrumented ones (we do not show the un-instrumented results, but these results are available upon request). There is suggestion that un-instrumented estimates are biased upwards; in particular, access to bank-finance is

higher by about  $35$  percentage points for networked firms. Further, the two coefficients involving institutional quality remain insignificant in the un-instrumented estimates though they turn out to be significant in the instrumented estimates.

Next, Table 7 includes the Balkan dummy and also its interaction with BA. In general, the effect of networking remains robust to the inclusion of these additional variables as has been highlighted by the positive and significant coefficient estimates of instrumented BA variable and also its interaction with the institutional quality. Note, however, that the size of the estimated marginal effect of BA is slightly larger when we include these additional controls.

As regards other results, firms with growing fixed assets tend to have significantly more bank and nonbank credit. However, the effect of firm size or firm age remains insignificant for determining the probability of firms relying on any type of financing. Further, the Balkan dummy is negative and significant for bank financing while BA membership in Balkan countries tends to significantly boost both bank and equity finance.

#### *Fixed effects panel logit estimates of firm financing choice*

Next we consider the panel fixed effects logit estimates of firm's financing choices, especially because these fixed effects estimates tend to minimize the endogeneity bias arising from the inclusion of time-invariant omitted factors. Since only logit (and not probit) models are amenable to fixed effects estimates, Table 8 shows the logit fixed effects' marginal effects estimates of firm's access to internal finance, bank finance, nonbank finance and equity finance (see columns 1–4 of the table). All SEs are clustered at the firm level. Note that we lose a significant number of observations in the panel fixed effects model if there is no variation in the access to loans from the particular source over the 2 years in our sample.

As before, fixed effects estimates (marginal effects) of firms' internal and external financing choices shown in Table 8 support the significance of BA membership for obtaining bank finance and nonbank finance only. Relative to pooled logit estimates shown in Tables 6 and 7, fixed effects estimates are bigger in size though the nature of the relationship remains rather similar. In particular, the coefficient of BA membership instrument is  $0.859$  so that these fixed effects estimates highlight a much larger and significant networking advantage in our sample. In contrast, networking is associated with significantly lower likelihood of relying on nonbank finance.

However, unlike pooled logit estimates, neither institutional quality nor its interaction with BA membership turns out to be significant in panel fixed effects models. In other words, there is some support to our second hypothesis that the significance of BA vanishes as institutional quality improves. However, it would be useful to examine the robustness of this result using a bigger panel sample, if possible.

*Pooled and panel fixed effects estimates for firms' access to state, private domestic and foreign bank loans*

Finally, in this section, we examine the role of BA membership for firm's access to loans from state bank, private domestic commercial bank and foreign bank. Following Table 4, we define three binary variables as follows:

Bank.private = 1 if a firm borrows from a private domestic commercial bank and zero otherwise.

Bank.state = 1 if a firm borrows from a domestic state bank and zero otherwise.

Bank.foreign = 1 if a firm borrows from a foreign bank and zero otherwise.

Given the binary nature of these variables, we first use pooled logit models to determine each of this choice (namely, state banks, private domestic banks and foreign banks). As before, we test the validity of our null hypotheses H10 and H20, but now with respect to firms' access to banks classified by ownership (i.e. state, private domestic commercial and foreign).

To rationalize the effect of BA membership on the choice of foreign banks, we consider the literature on foreign banks' entry and lending behaviour in developing and transition economies (e.g. see, Bonin and Leven, 1996). There is a suggestion that foreign banks tend to lend to borrowers with better accounting and reporting standards (and thus may prefer foreign firms) or with those firms that have established international links by virtue of their import/export activities. In an uncertain foreign environment, foreign banks may choose networked firms with a view to lower their agency costs. This is related to the concept of firm-bank ownership matching, as observed by Berger *et al.* (2006) for India. Accordingly, we examine whether foreign firms are more likely to borrow from foreign banks while state-

owned firms are more likely to borrow from state banks in our sample of the CEE countries. However, we do not have a prior knowledge as to how BA membership can influence firm's choice of private domestic or state banks, and therefore empirically explore these cases in our sample.

Given the potential endogeneity problem of a firm's affiliation to a BA, first we instrument this variable, using BA membership estimates shown in Table 5. The set of firm-specific control variables has some common variables as in  $X$  (see Equations 1 and 2); for example, we continue to include control variables for SMEs, young firms, and also firm ownership type (state firm, domestic firm, foreign firm). As we focus on banking relationship only, we now replace the competition policy index by the EBRD bank reform index which is more pertinent for firms' access to banks, with a view to explore the effect of bank reform on firms' access to state, private domestic and private foreign banks.<sup>2</sup>

Table 9 shows the marginal effects of the pooled logit model determining firm's access to state bank, private domestic commercial banks and foreign banks in 2005. All SEs are clustered at the firm level. Our diagnostic tests confirm the goodness-of-fit of the estimated logit model in this respect. While BA membership is insignificant for firms' access to loans from state bank, the coefficient of the variable is positive and significant for firms borrowing not only from private domestic commercial bank, but also from foreign banks. In other words, affiliation to BA is conducive to securing loans particularly from new domestic and foreign private banks, which face uncertain business conditions, especially in countries with weaker institutional environment in our sample. Further compared to foreign banks, the marginal effect of BA membership is significantly higher for domestic banks (10 percentage points as opposed to about two percentage points). In other words, private domestic banks tend to rely more on firms' BA membership with a view to hedge risk in an uncertain world. In addition, the interaction term between BA membership and institutional quality is positive and significant only for loans from domestic banks so that domestic banks tend to offer significantly higher loans to networked firms even in countries with better institutional quality in our sample.

It is evident that state banks' role has been curtailed by the recent reforms as the transition process deepens and as such there is evidence that state firms are less likely to borrow from any private banks – domestic or

<sup>2</sup>We included all institutional variables in an alternative specification, but the competition index was never significant. Thus, the final specification does not include the competition index.

**Table 9. Pooled logit marginal effects estimates of firms' access to banks by ownership**

Dependent variable	(1)	(2)	(3)
	State bank	Private domestic bank	Private foreign bank
Predicted BA ( <i>BA</i> )	-0.000438 (0.0130)	0.100*** (0.0295)	0.0174** (0.0811)
Institutional quality ( <i>IQ</i> )	0.00441** (0.00183)	-0.0119*** (0.0033)	-0.00169 (0.00121)
BA * Institutional quality	0.002** (0.001)	0.009*** (0.003)	-0.001 (0.001)
State firm	-0.0243** (0.009)	-0.0823** (0.034)	-0.0141* (0.008)
Foreign firm	-0.0200 (0.0123)	-0.107*** (0.0294)	-0.003 (0.0117)
Private domestic firm	-0.005 (0.015)	0.013 (0.034)	0.003 (0.009)
Balkan country	-0.0338 (0.0226)	-0.144*** (0.0414)	-0.0191** (0.009)
Balkan country* BA	0.0633 (0.0791)	0.0692 (0.0485)	0.0228 (0.0202)
Wald test of joint significance of <i>BA</i> and <i>BA*IQ</i>	4.66*	25.88***	5.11*
McKelvey and Zavoina pseudo- $R^2$	0.0644	0.0421	0.1189
Likelihood ratio Chi-square (14)	51.71***	88.84***	87.09***
Number of observations	2365	2365	2365

Notes: All SEs are clustered at the firm level. Robust SEs are shown in parentheses. Other control variables include firm size (SMEs), young firms, growth of fixed assets, research and development spending and also EBRD bank reform index. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively.

**Table 10. Logit fixed effects estimates of firms' access to banks**

	Firms borrowing from		
	State bank	Local private commercial bank	Foreign bank
BA	-0.611 (0.842)	0.754*** (0.325)	1.336 (1.475)
Institutional quality	0.0399 (6.507)	0.0632 (0.351)	Na[1]
BA * Institutional quality	0.0945 (0.137)	-0.0608 (0.0527)	-0.0766 (0.250)
Growth of fixed assets	-0.0126 (0.0454)	-0.006** (0.00327)	0.0181 (0.0149)
Firm fixed effects	Yes	Yes	Yes
LR Chi-square (4)	0.23	2.16*	0.68
Number of observations	82	196	50
Number of firms	41	98	25

Notes: The table makes use of the panel component of BEEPS 2002 and 2005 data. All SEs are clustered at firm level. Robust SEs are shown in parentheses. \*, \*\* and \*\*\* denote significance at the 10, 5 and 1% levels, respectively.

foreign. In addition, foreign firms are less likely to borrow from private domestic commercial banks, while the estimated coefficient is insignificant for loans from state and foreign banks. In contrast, there is no evidence that private domestic commercial firms are more or less likely to borrow from any type of banks in our sample. Accordingly, the evidence of

firm-bank ownership matching turns out to be rather weak in these pooled estimates.

Finally, we consider the corresponding panel fixed effects logit estimates of firms' choice of banks as summarized in Table 10. This is because we argue that fixed effects estimates are superior to pooled estimates since we can exploit the variation in firm's

BA membership over the 2 years to identify a causal effect of BA on firms' access to any bank loans. As with single cross-section analysis, BA membership significantly enhances the likelihood of firms borrowing from private domestic banks, but not from state or foreign banks, as the estimated coefficients remain insignificant in these cases. In particular, a networked firm (relative to a nonnetworked firm) is about 75 percentage points more likely to borrow from private commercial banks, even after controlling for all other possible covariates. Note also that compared to the pooled estimates (Table 9), marginal effects of networking is higher in panel data estimates (0.75 as opposed to 0.10 for private domestic banks). Finally, the differential effect of networking vanishes for access to loans from private banks as institutional quality improves. However, the fact remains that the size of our panel sample is rather small, and therefore it would be interesting to see if these results hold in larger samples.

## V. Concluding Comments

Financial intermediation may not always guarantee the efficient utilization of credit, especially if there are market imperfections and institutional weaknesses. In this respect, this article explores a possible mechanism through which networking, as measured by firm's affiliation to BA, could affect firms' financing opportunities, which in turn determine corporate investment and growth in the selected CEE countries.

Following the recent institutional economics as well as organizational behaviour literature, we argue that firms' association with informal business networks may help them secure external finances in general and bank finance in particular, especially in countries with weaker institutions. We further examine if the importance of affiliation to business networks disappears in countries with better institutional quality. Results from a sample of CEE transition countries do confirm the positive role of business networks on firm's access to bank finance. In particular, there is evidence that affiliation to BA significantly boosts networked firms' access to bank loans, even after controlling for all possible factors. Positive role of networks for members is particularly evident for firms borrowing from private domestic commercial banks and also, to a lesser extent, from foreign banks. The effect is robust in both single cross-section and panel data analyses, though there is some evidence that single cross-section estimates tend to under-estimate the effect of networking. With respect to our second hypothesis, there is evidence

from the single cross-section estimates that the importance of BA persists even when the institutional quality improves, especially for firms' access to bank and nonbank finance and also for firm's borrowing from state and private domestic banks. Note, however, that the significant differential effect of BA for countries with higher institutional quality disappears when we consider panel data instead.

Forming networks to secure bank loans and other business facilities may not necessarily be an efficient arrangement for the broader economy, as it may promote the interests of those networked firms which are successful to belong to good networks through family/political connections or otherwise, but are not necessarily more efficient firms. In this process nonnetworked SMEs are discriminated, despite various on-going reforms. In other words, contrary to the common wisdom, evidence from our analysis suggests that social capital may not necessarily be a welfare improving arrangement.

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**Appendix****Table A1. Descriptive statistics**

Variable names	2005 sample		2002 and 2005 panel data	
	Mean	SD	Mean	SD
100% Internal finance	0.50	0.50	0.49	0.50
Bank finance	0.26	0.43	0.27	0.44
Nonbank finance	0.19	0.39	0.60	0.49
Equity finance	0.06	0.24	0.05	0.22
State banks	0.04	0.20	0.053	0.22
Private domestic commercial banks	0.19	0.39	0.19	0.39
Foreign banks	0.03	0.17	0.037	0.19
BA	0.48	0.50	0.38	0.48
Growth of fixed assets	16.96	33.96	22.70	44.44
Institutional quality	3.63	4.60	2.13	4.95

*Source:* 2002 and 2005 BEEPS data and EBRD institutional indices.