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Politically connected firms and privileged access to credit: Evidence from Central and Eastern Europe☆

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ABSTRACT

We use firm-level data from six Central and Eastern European economies to examine whether political connections ease financial constraints faced by firms. We show that politically connected firms are characterized by higher leverage, lower profitability, and lower productivity of capital than unconnected firms. However, we do not find any significant difference in investment rates between them. Politically connected firms, though less productive than unconnected firms, borrow more because they have easier access to credit. Our results are consistent with the idea that political connections distort capital allocation and may have welfare costs.

1. Introduction

How beneficial are political connections to firms? In this paper, we address this question using a data set covering more than 460,000 firms located in six Central and Eastern European countries. We document the characteristics of politically connected firms in contrast to unconnected firms in order to identify the channels through which political connections might be at play. Specifically, by examining how political connections affect firms' access to finance, we show that connections ease credit constraints even for firms with low productivity. Our findings are consistent with the idea that political connections distort capital allocation and may have welfare costs.

The role of political connections might be particularly important in the formerly planned economies of Central and Eastern Europe. Faccio's (2006) study of the correlation between the presence of political connections and corruption finds that Russian firms have the highest degree of political connections (in her sample, politically connected firms represent more than 85% of market capitalization). There is, however, limited research on the links between political connections and access to credit in the group of countries on which we focus. To the best of our knowledge, the only paper that studies the link between political connections and

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access to finance in Central Europe is Hasan et al.'s (2017).[1] These authors focus on Poland and find that politically connected firms had easier access to credit in the aftermath of the 2007 financial crisis.

In this paper, we aim at filling this gap in the literature and document the link between political connections and access to credit using a large sample of firms from Bulgaria, Hungary, Romania, the Russian Federation, Serbia, and the Slovak Republic observed over the period 2008–2013. Our choice of countries and time period is dictated by data availability. However, we think that the case of transition economies is particularly interesting as these countries do not have long-established institutions aimed at dealing with corporate governance issues. The 2008–2013 period is also of particular interest because credit constraints were paramount in the aftermath of the Global Financial Crisis.

Using these data, we show that connected firms, in comparison to their unconnected peers, have higher levels of leverage, are less profitable, have lower productivity of capital, and do not invest more. A major finding is that political connections appear to ease credit constraints. In addition, we find evidence that this privileged access to credit generates distortions in the allocation of capital as connected firms which benefit from easier credit tend to be less productive.

Our empirical strategy consists of two steps. In the first step, we explore whether politically connected firms differ from unconnected firms along four dimension: access to credit, profitability, investment, and productivity of capital.

We expect to find that politically connected firms have easier access to credit for essentially two reasons. First, politicians can give instructions to state-owned banks or pressure private banks to lend more to connected firms. Second, politicians can create incentives to lend more to connected firms by reassuring lenders with implicit or explicit guarantees on the solvency of these firms.

If, other things equal, politically connected firms with easier access to credit misallocate some of the resources they receive, we should further expect that these firms will have a lower average product of capital. This is also the message of Akcigit et al. (2018) who show that there is a trade-off between investment in innovation and investment in political connections.

The effect of political connections on profitability and investment levels is, instead, uncertain. On the one hand, political connections could increase profitability via the same channels through which they increase access to credit. On the other hand, politically connected firms could be less efficient and thus less profitable. The same applies to investment. While larger credit availability could lead to higher (but possibly less effective) investment levels, political distortions could lead to wasted resources and lower investment levels.

Our results support the hypotheses that, compared with unconnected firms, politically connected firms in the transition economies that we study are characterized by higher leverage and lower productivity of capital. We also find that politically connected firms are less profitable than connected firms, but that they are not different from unconnected firms in terms of investment rates.

Our findings are consistent with the presence of corruption and misallocation of resources. Nevertheless, we recognize that our time-invariant measure of political connections does not allow controlling for firm-level unobserved heterogeneity. It is thus possible that our results are driven by firm characteristics which are not observable by the econometrician but are observable by firm managers or loan officers.

In the second step of our analysis, we address this potential problem by using an empirical strategy that allows testing whether political connections ameliorate credit constraints, while including firm-level fixed effects, and thus controlling for unobserved heterogeneity.

We start from the observation that in the presence of perfect capital markets internal and external funds are perfect substitutes and investment decisions should not depend on a firm's financial structure. In the presence of financial market frictions, instead, investment may depend on the availability of internal funds. Specifically, in the presence of credit rationing, internal funds will be cheaper than external funds. This leads to a "pecking order" for firm financing in which firms first use internal funds to finance investment and only seek outside funds when internal funds are exhausted (Myers (1984) and Myers and Majluf (1984)).

Fazzari et al. (1988) were the first to exploit this idea and propose a test of credit constraints based on the sensitivity of investment to internally generated funds (measured by cash-flow). They argued that, conditional on firm-specific factors that affect investment demand, a positive correlation between investment and cash flow would be *prima facie* evidence of the presence of credit constraints. Love (2003) extends this approach by showing that the interaction between cash flow and a country-specific measure of financial market depth is negatively correlated with firm-level investment. She then convincingly argues that the finding that financial depth reduces the correlation between investment and cash flow supports the hypothesis that financial depth plays a useful role in ameliorating credit constraints. Huang et al. (2020) and Huang et al. (2018) use a similar strategy to show that public debt tightens credit constraints.

We too use a similar approach. By interacting a political connection dummy with cash flow, we show that politically connected firms are less likely to be credit constrained than unconnected firms, even while controlling for firm-level unobserved heterogeneity. In fact, our point estimates suggest that the average politically connected firm does not face any type of credit constraint and that this result is robust to controlling for unobserved heterogeneity.[2]

Our paper is related to a vast literature on the benefits enjoyed by politically connected firms (see, among others, Stigler (1971), de Soto (1989), and Faccio (2006)) and to Shleifer and Vishny's (1994) work on the incentive structure of state-owned enterprises and private enterprises subject to political influence. Fisman (2001) looks at stock market returns of politically connected firms during the Indonesian crisis of 1997 and shows that most of the value of the firms linked to President Suharto was driven by

[1] Palanskỳ (2021) focuses on the Czech Republic but does not study the link between political connections and access to finance. However, he finds that there is a positive relationship between corporate donations to political parties and firm profitability.

[2] Kaplan and Zingales (2000) criticized the original approach of Fazzari et al. (1988) by pointing out that cash flow could be a proxy for investment opportunities. In Section 4, we discuss why the Kaplan and Zingales (2000) criticism is unlikely to apply to our empirical strategy.

their connections with the president and his family.[3] Frye and Yakovlev (2016) focus on the aftermath of a parliamentary election that weakened the Russian ruling party and show that managers of politically connected firms perceived that these electoral results negatively affected their property rights. There is also evidence that a good institutional set-up can mitigate the value of connections. For instance, Lehrer (2018) finds no evidence that an unexpected electoral result impacted the returns of connected firms listed in the Tel Aviv Stock Exchange.

Our work is also related to research that studies how the presence of political connections can harm economic growth by limiting innovation and competition. Using a model of Schumpeterian growth, Bellettini et al. (2014) study how politicians can create incentives for firms to invest in political connections and show that this prevents entry of innovative competitors. Along similar lines, Bellettini et al. (2013) develop a model in which low-productivity firms develop political connections to limit competition and show that in countries with high levels of red tape there is a negative relationship between persistence in office of politicians and economic growth. Our paper is also related to Akcigit et al. (2018) who build a model in which firms can invest in political connections and innovation and then use Italian data to show that politically connected firms innovate less than unconnected firms and have higher employment and revenue growth but lower productivity growth.

Our focus on the links between political connections and credit constraints is closely related to a series of papers showing that connected firms tend to have better access to finance. Existing work has focused on Brazil (Claessens et al., 2008), Malaysia (Bliss and Gul, 2012), Indonesia (Leuz and Oberholzer-Gee, 2006), Italy (Sapienza, 2004), and Pakistan (Khwaja and Mian, 2005). In the case of the United States, Blau (2017) finds that politically connected banks were substantially more likely to participate in the emergency loan programs implemented by Federal Reserve during the Global Financial Crisis. There is also a large body of literature that focuses on China and shows that political connections and affiliation with the communist party give greater access to loans, especially from state-owned banks (see, among others, Li et al. (2008), Chen et al. (2014), and Peng et al. (2017)).[4]

While most studies focus on just one country (Faccio (2006), who focuses on political connections in listed companies from 47 countries, is an exception) and only use data for listed firms, we study the link between political connections and access to credit in a sample of 6 countries by focusing on both listed and unlisted firms.

The paper is organized as follows: the next section describes the data and how we identify and measure political connections. Section 3 provides an initial assessment of the differences between connected and unconnected firms in terms of their leverage, profitability, and investment ratios. Section 4 documents that availability of internal funds is less important for investing in the case of connected firms, demonstrating that they have easier access to credit than comparable unconnected firms. Section 5 discusses the welfare implications of our results. Some final remarks follow in Section 6.

2. Data

2.1. Measuring political connections

We implement our empirical strategy using two sources of data. The first data source is a proprietary database that documents in detail an extensive list of politically exposed persons (PEPs). The data are primarily used by private institutions to undertake due diligence. The information on individuals, firms and their links in this data set is collected from both international and national official records, from reputable, publicly available media, and by research analysts.

In the PEP data set, a politically exposed person is identified following the definition of the Financial Action Task Force, which is also similar to that of the European Union's Anti-Money Laundering Directive. This definition is quite broad as it includes all persons currently holding or having held a political position by either appointment or election. Close family (parents, spouses and children) as well as any close associates (individuals with interests in a legal entity in which the principal PEP also has an interest, currently or in the past) are also considered politically exposed and identified as PEP. The group of close associates also includes private companies, entities, trusts charities, foundations, or any other onshore or offshore vehicles controlled, owned or co-owned by primary PEP. Bussolo et al. (2018) provide a detailed discussion on the PEP data set.

Based on the primary affiliation of the politically exposed person, the data set distinguishes the following four sub-categories: (i) National Government; (ii) Sub-National Government; (iii) Local Government; and (iv) Non-Government.[5]

National government affiliated PEPs include senior members of the executive, legislature, judiciary, police, and military units of national or federal governments, senior central government administration officials, senior civil servants, senior government officials, high-ranking officers in the diplomatic service, and senior executives of national-level state-owned enterprises.

Sub-national government PEPs include senior members of the executive, legislature, judiciary, and police of sub-national governments such as provinces, states, and regions within a national government, and senior civil servants, senior government officials at sub-national level, and senior executives of sub-national level state owned enterprises.

Local government PEPs include mayors and deputy mayors of local government, senior executives of state-owned enterprises administered or owned at the local level. Non-government PEPs include influential religious leaders and representatives of religious

[3] Hong and Lim (2016) show that a South Korean private university that recruited a former vice minister of education received more funding from the education ministry. Lévêque (2020), instead, focuses on the importance of personal connections and using data from French municipal elections shows that relatives of individuals who supported the elected mayor were more likely to receive building permits.

[4] An interesting study in the context of China is Shu and Cai's (2017) analysis of how a ban on lavish alcohol consumption at military banquets contributed to president Xi Jinping anti corruption campaign.

[5] The original PEP data set has eight categories of politically exposed persons. These comprise individuals in International and Regional Organizations, National, Sub-national and Local Government, State-Owned Enterprises and State-Invested Enterprises, as well as Non-Governmental Organizations ((Bussolo et al., 2018)). However, for the countries in our sample, after merging with Orbis data we find the four aforementioned categories to be relevant. Please note that for our analysis we collapse State-Owned Enterprises and State-Invested Enterprises to a single category which we call State Enterprises.

Table 1
Connected and unconnected firms by country.

		Number of firms	Number of obs.
Bulgaria	Connected	36	154
	Not connected	22,278	74,516
Hungary	Connected	229	824
	Not connected	158,059	552,371
Romania	Connected	870	3761
	Not connected	163,373	630,704
Russian Federation	Connected	340	1256
	Not connected	26,359	97,036
Serbia	Connected	149	596
	Not connected	42,419	147,078
Slovak Republic	Connected	341	1228
	Not connected	44,158	155,024

organizations with political, judicial, military, and financial responsibilities, senior political party officials and functionaries, and senior members of political pressure groups and trade unions exercising political influence or pressure.

A wide range of information is collected for each politically exposed person. In particular, the data set reports association with specific firms, and whether these linkages are established directly, or through family members, close business associates, advisers, or other firms of each individual PEP. In this way, the PEP data set goes beyond being a simple list of names of individuals, as it also provides the connections of these individuals with firms.

2.2. Firm-level data

Detailed information on firms is provided by our second data source which is the Orbis data set by Bureau van Dijk. Orbis reports corporate ownership and shareholder information, along with balance sheet and financial data for listed and unlisted firms. While Orbis provides an extensive resource for firm-level empirical studies, there are several challenges related to using this data set. We address these challenges with the three steps approach first proposed by Kalemli-Özcan et al. (2015, 2018). First, we drop firms with inconsistent information on generic variables such as date of establishment, type of company, and suspect of inconsistent units.[6] Second, we drop firms for which total assets, fixed assets, sales, number of employees, wages, or cost of goods sold is negative in any year. We also drop firms that report having more than 2 million employees. Third, we drop observations for firm-years with zero or missing values for total assets.[7]

Our main firm-level variables are Investment, Return on Assets (ROA), Leverage, Cash Flow, Sales Growth, and the Average Product of Capital. Investment is defined as change in fixed assets scaled by total assets. ROA is the percentage share of financial and operational profits (before taxes) to total assets. Leverage is the ratio of total debt to total assets. Cash Flow is taken from balance sheet data directly and is scaled by total assets. Sales Growth is calculated as the annual change in sales over total assets. We follow Hsieh and Song (2015) and use the average product of capital (measured as value added over fixed assets) as a proxy for the marginal product of capital.

We also use information on firm size, age, and whether a firm is state-owned or not. Firm size is captured with two dummy variables. The first takes a value of one for firms with more than 250 employees (a threshold used to define large firms in the World Bank Enterprise Surveys) and less that 10,000 employees and the second takes value one for very large firms with at least 10,000 employees. Age is included in our analysis by including a dummy variable that takes a value of one for firms with less than six year of age. Utilizing continuous measures of size and age instead of the dummy variables does not influence our results. Finally, to alleviate any concerns that state-owned firms are different from connected firms, we also use an alternative definition of political connections by separating the effect of political connections from that of state ownership.

2.3. Identifying the sample

By merging Orbis with the PEP data set, we construct a firm-level data set which distinguishes politically connected firms from non-connected firms.[8] Our sample consists of about 1.7 million observations from more than 460,000 firms from six countries over

[6] The criteria for consistency check are based on a "reasonable" move in total assets. We drop firms if we observe a sudden sharp spike in growth rate of total assets, with a lower threshold of −99% and an upper threshold 19900%.

[7] Table A.1 details the number of observations that are dropped at each step, distinguishing between connected and non-connected firms.

[8] We use two steps to merge the data. The first step involves using the names of the firms that appear in PEP Data and matching them with the same named firms recorded in Orbis. The second step consists of linking the PEPs from PEP Data with firms in Orbis when the names of the PEPs match the names of people appearing in the list of shareholders of the Orbis' firms. Because of the commonality of names, each possible match was subsequently reviewed manually to ensure the integrity of the match. Researchers based in each country and with extensive local knowledge checked each match using a range of complementary

the period 2008–2013; of these 460,000 firms about 2000 are classified as politically connected. Table 1 reports the distribution of firms across the six countries covered in our sample and Table 2 reports summary statistics for the main variables used in our analysis (the top panel reports data for all firms and the mid and bottom panels separate connected and unconnected firms).[9]

There are large differences in the number of firms reported by Orbis and in the share of connected firms. While Orbis includes data from more than 160,000 firms in Hungary and Romania, we have fewer than 50,000 firms for Serbia and the Slovak Republic, and fewer than 30,000 firms for Bulgaria and the Russian Federation (Table 1). The share of observations for connected firms ranges from about 0.14% in Hungary, to nearly 1.5% in the Russian Federation.[10]

Note that the share of politically connected firms in our data is much lower than what is reported by other authors. For instance, we find that less that 1.5% of Russian firms are politically connected, while Faccio (2006) finds that 85% of market value in Russia is related to politically connected firms. There two reasons for this difference in the share of politically connected firms. First, while we use both listed and unlisted firms (nearly 29,000 firms in the case of Russia), Faccio only focuses on listed firms (25 firms in the case of Russia). Second, while we focus on number of firms, Faccio reports market capitalization shares. As connected firms are usually larger than unconnected firms, the share of market capitalization of connected firms tends to be much larger than the share of connected firms when we focus on the number of firms.

Comparing median and average values highlights that the underlying distributions are skewed for most variables. To minimize the influence of outliers, we winsorize the investment, cash flow, and sales growth variables at 1%. We observe a large support for winsorized sales growth which in the full sample ranges between −0.9% and 6.6%. Despite the winsorization, the support of cash flow remains large, with values ranging from 0% to 73%. While the standard deviation of the cash flow of non-connected firms is larger than that of connected firms, there are no large differences in the mean value of cash flow of connected and non-connected firms. Connected and non-connected firms also look similar in terms of investment rates but Connected firms tend to be older and are more likely to be large.

3. Political connections, leverage, and profitability

We start by studying the correlation between political connections and each of firms' leverage, profitability (as measured by returns on assets), investment rate, and average product of capital, conditional on a set of country-sector-year fixed effects and firm-specific controls. Formally, we estimate the following model:

$$y_{i,t} = \beta PC_i + X_{i,t}\Gamma + \xi_{c(i),s(i),t} + \epsilon_{i,t} \tag{1}$$

where $y_{i,t}$ is a measure of firm performance or leverage, for firm i (in sector s and country c) and year t, PC_i is a time-invariant dummy that takes value one if firm i is connected, $X_{i,t}$ is a matrix of firm characteristics (age, size, and whether the firm is state-owned or not), and $\xi_{c(i),s(i),t}$ are country-sector (measured at the four-digit level)-year fixed effects. In estimating Eq. (1), we cluster the standard errors at the firm level.[11]

As a first step, we estimate Eq. (1) without controlling for firm characteristics (i.e., by setting $\Gamma = 0$). Panel A of Table 3 shows that politically connected firms tend to have higher leverage than unconnected firms. The point estimate suggests that leverage in connected firms is 2.2 percentage points higher than in unconnected firms (column 1 of Table 3). Given that average leverage in our sample of unconnected firms is approximately 13%, this point estimate implies that leverage in connected firms is nearly 20% higher than leverage in unconnected firms.

While politically connected firms tend to take more debt than unconnected firms, they are significantly less profitable than firms that do not have political connections. Column 2 of Table 3 shows that profitability (measured by Return on Assets, ROA) in connected firms is about 1.8 percentage points lower than in unconnected firms (a 15% difference with respect to average profitability in our sample of unconnected firms). Our results are, thus, similar to Bliss and Gul's (2012) findings that politically connected firms in Malaysia have higher leverage and lower profitability.

It is possible that, like the typical start-up, politically connected firms are highly leveraged and have low profitability because they are taking debt to invest and grow. However, there is no evidence that these politically connected firms are using the borrowed funds to finance investment projects. Column 3 of Table 3 suggests that there is no statistically or economically significant difference in the investment rate of politically connected firms vis- à-vis unconnected ones (if anything, the coefficient is negative). Finally, column 4 of Table 3 shows that the average product of capital is significantly lower in connected firms, indicating that these firms adopt less efficient investment strategies. The point estimate suggests that the average product of capital is 40% lower in connected firms (the dependent variable is measured in logs).

Panel B of Table 3 controls for firm characteristics and uses an alternative definition of political connections. In terms of firm characteristics, we focus on age, size, and state ownership. We find that young firms are more profitable, have higher investment

sources and documentation. A substantial number of matches were discarded as false positives and a revised set of matches adopted. Once the two steps are completed, their combination create our measure of political connections. Bussolo et al. (2018) exploit the network dimensions of these connections and provide a detailed discussion of these matching strategies.

[9] Table A.2 shows how much of the official gross output (turnover) data from Eurostat is covered by the firms in our sample.

[10] Note that we use all available data and do not restrict the sample of non-connected firms. We could have used matching methods to reduce the sample of non-connected firms. However, we felt that the choice of firm characteristics used in the matching exercise would have been arbitrary. Hence, we decided to simply control for firm characteristics, including firm fixed effects (see Eq. (2)).

[11] Clustering at a different level or removing clustering does not affect the results.

Table 2
Summary statistics.

	Mean	SD	Med.	Min	Max	N
	Full sample					
$Investment_t$	0.060	0.23	0.016	−58.8	84.8	1,643,779
Capitalization	0.505	0.29	0.497	0.0	45.1	1,643,653
Sales growth	0.076	0.74	−0.044	−0.9	6.6	1,643,779
Cash flow	0.184	0.20	0.122	0.0	73.2	1,643,779
Leverage	0.130	0.20	0.012	0.0	9.0	1,643,779
APK	0.377	1.76	0.217	−13.6	6.1	1,643,779
ROA	0.120	0.17	0.059	−1.0	1.0	1,643,779
Large	0.022	0.15	0.000	0.0	1.0	1,643,779
Mega	0.000	0.01	0.000	0.0	1.0	1,643,779
Young	0.216	0.41	0.000	0.0	1.0	1,643,779
Local Government	0.000	0.02	0.000	0.0	1.0	1,643,779
State Government	0.001	0.04	0.000	0.0	1.0	1,643,779
National Government	0.003	0.05	0.000	0.0	1.0	1,643,779
State Enterprise	0.000	0.01	0.000	0.0	1.0	1,643,779
APK below median	0.503	0.50	1.000	0.0	1.0	1,643,779
LAPK	0.251	0.43	0.000	0.0	1.0	1,643,779
ROA below median	0.502	0.50	1.000	0.0	1.0	1,643,779
LROA	0.250	0.43	0.000	0.0	1.0	1,643,779
	Only connected firms					
$Investment_t$	0.054	0.16	0.017	−2.2	1.5	7671
Capitalization	0.496	0.29	0.475	0.0	1.0	7671
Sales growth	0.081	0.76	−0.035	−0.9	6.6	7671
Cash flow	0.149	0.17	0.091	0.0	1.3	7671
Leverage	0.167	0.22	0.053	0.0	2.2	7671
APK	−0.307	1.79	−0.485	−9.1	6.1	7671
ROA	0.101	0.15	0.045	−1.0	1.0	7671
Large	0.082	0.27	0.000	0.0	1.0	7671
Mega	0.003	0.05	0.000	0.0	1.0	7671
Young	0.123	0.33	0.000	0.0	1.0	7671
Local Government	0.058	0.23	0.000	0.0	1.0	7671
State Government	0.309	0.46	0.000	0.0	1.0	7671
National Government	0.580	0.49	1.000	0.0	1.0	7671
State Enterprise	0.031	0.17	0.000	0.0	1.0	7671
APK below median	0.626	0.48	1.000	0.0	1.0	7671
LAPK	0.370	0.48	0.000	0.0	1.0	7671
ROA below median	0.549	0.50	1.000	0.0	1.0	7671
LROA	0.285	0.45	0.000	0.0	1.0	7671
	Only non-connected firms					
$Investment_t$	0.060	0.23	0.016	−58.8	84.8	1,636,108
Capitalization	0.505	0.29	0.497	0.0	45.1	1,635,982
Sales growth	0.076	0.74	−0.044	−0.9	6.6	1,636,108
Cash flow	0.184	0.20	0.122	0.0	73.2	1,636,108
Leverage	0.130	0.20	0.012	0.0	9.0	1,636,108
APK	0.380	1.76	0.220	−13.6	6.1	1,636,108
ROA	0.120	0.17	0.059	−1.0	1.0	1,636,108
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Mega	0.000	0.01	0.000	0.0	1.0	1,636,108
Young	0.216	0.41	0.000	0.0	1.0	1,636,108
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State Government	0.000	0.00	0.000	0.0	0.0	1,636,108
National Government	0.000	0.00	0.000	0.0	0.0	1,636,108
State Enterprise	0.000	0.00	0.000	0.0	0.0	1,636,108
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ROA below median	0.502	0.50	1.000	0.0	1.0	1,636,108
LROA	0.250	0.43	0.000	0.0	1.0	1,636,108

$Investment_t$ is $\frac{\Delta_t Fixedassets}{Totalassets}$; Capitalization is $\frac{Equity}{Totalassets}$; Sales growth is $(\frac{Sales_t}{Sales_{t-1}} - 1) * 100$; Cash flow is $\frac{Cashflow}{Totalassets}$; Leverage is $\frac{Debt}{Totalassets}$; Average Product of Capital (APK) is defined as $ln(\frac{Valueadded}{Fixedassets})$; ROA is $\frac{EBIT}{Totalassets}$; Large is a dummy taking value 1 if a firm has at least 250 employees; young is a dummy variable that takes value 1 if a firm is less than 6 years old.

rates, and a higher average product of capital than older firms. Larger firms are instead characterized by higher leverage, lower profitability, and lower investment rates. Average productivity of capital is instead especially low for very large firms. We obtain similar results if we use continuous measures of size and age instead of using the dummy variables described above.

Table 3
Political connections and firm performance.

	(1)	(2)	(3)	(4)
	Leverage	ROA	Investment	APK
	Panel A			
Connected	0.022***	−0.018***	−0.002	−0.405***
	(0.005)	(0.003)	(0.002)	(0.035)
Country-Sector-Year FE	Yes	Yes	Yes	Yes
N. firms	456,560	456,560	456,560	456,560
N. observations	1,643,771	1,643,771	1,643,771	1,643,771
	Panel B			
Connected, excl. SOE	0.018***	−0.012***	0.000	−0.344***
	(0.006)	(0.003)	(0.002)	(0.044)
State Enterprise	−0.023	−0.013	−0.013*	−0.151
	(0.023)	(0.014)	(0.007)	(0.234)
Young	0.005***	0.046***	0.044***	0.392***
	(0.001)	(0.000)	(0.000)	(0.005)
Large	0.040***	−0.023***	−0.004***	−0.294***
	(0.002)	(0.001)	(0.001)	(0.015)
V. Large	0.085***	−0.042***	−0.038***	−0.915***
	(0.026)	(0.007)	(0.005)	(0.123)
Country-Sector-Year FE	Yes	Yes	Yes	Yes
N. firms	456,560	456,560	456,560	456,560
N. observations	1,643,771	1,643,771	1,643,771	1,643,771

This table reports a set of regressions where the dependent variable is either leverage measured as debt over total assets (column 1), profitability measured as return on assets (column 2), investment rate measured as investment over total assets (column 3), or average product of capital (APK) measured as value added over fixed assets (column 4). All regressions control for a dummy taking value one for connected firms, and country-sector-year fixed effects. The bottom panel separates the effect of political connections from that of state-ownership and controls for a dummy variable taking value one for young firms (defined as firms with less than 6 years of age), a dummy taking value one for firms with more than 250 and less than 10,000 employees (Large), and a dummy taking value one for firms with more than 10,000 employees (V. Large).
Robust standard errors clustered at the firm level are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

With respect to the definition of political connections, we separate the effect of political connections from that of state ownership. The regression results suggest that state-owned firms are not significantly different from unconnected firms, while we still find that non-state owned connected firms are characterized by higher leverage and lower profitability and capital productivity.[12] We also find that state-owned firms tend to have lower levels of investment.

It should be noted that our measure of political connection does not vary across years, and that the use of a time-invariant control with a dependent variable that varies over time could lead to statistical inference problems. While this should not be a problem as we are careful in clustering our standard errors at the firm level (which is the source of variation in our measure of political connections), we check whether our results are robust to collapsing our data set and using firm-level averages. Table 4 shows that our results are robust to using just one observation per firm.

There are three possible concerns linked to the fact that politically connected firms are able to borrow more while being less profitable than non-connected firms. First, overleveraged unprofitable firms may default on their debts, with consequences for financial stability and, possibly, fiscal costs if the government needs to bail out the banking system. Second, the fact that politically connected firms have privileged access to credit may lead to a suboptimal allocation of capital, and lower economic growth, if these firms are less productive than their unconnected counterparts (see Akcigit et al. (2018) and Bellettini et al. (2014)). Third, even if connected firms happen to have higher future profitability (which we cannot observe in our data) and thus their easy access to credit is not a source of concern for financial stability purposes, the correlation between access to credit and political connections may still reflect the presence of insider trading or corruption. The link between political connections and higher future profitability could be due to the fact that politicians decide to build connections with firms that have bright prospects or to the fact that these future bright prospects are driven by patronage associated with the connections. In the first case, future profitability causes connections, and the fact that politicians know which firms will be more profitable in the future may be associated with the presence of insider trading. In the second case, connections cause future profitability and the link between easier access to credit and political connections may be associated with corruption and resource misallocation.

We have already shown that higher leverage cannot be attributed to observable profitability or higher investment ratios, as connected firms are less profitable and do not differ from unconnected firms in terms of investment activity. Nevertheless, connected firms may have characteristics that increase their future profitability which are observable by loan officers but not observable by the econometrician. If this were the case, we would be wrongly attributing to political connections what is in fact proper credit evaluation by bank officers. As in our data political connections are time-invariant, Eq. (1) cannot include firm fixed effects which control for time-invariant firm-specific variables which could be jointly associated with future profitability and political connections.

[12] We obtain similar results if we control for size and age and we use a definition of political connection that include state-ownership.

Table 4
Political connections and firm performance, cross-section estimations.

	(1) Leverage	(2) ROA	(3) Investment	(4) APK
	Panel A			
Connected	0.021***	−0.016***	−0.001	−0.438***
	(0.005)	(0.003)	(0.002)	(0.037)
Country-Sector FE	Yes	Yes	Yes	Yes
N. firms	456,560	456,560	456,560	456,560
N. observations	456,560	456,560	456,560	456,560
	Panel B			
Connected, excl. SOE	0.015***	−0.012***	−0.002	−0.403***
	(0.005)	(0.004)	(0.003)	(0.046)
State Enterprise	−0.015	−0.012	−0.014**	−0.069
	(0.024)	(0.014)	(0.007)	(0.247)
Young	0.000	0.025***	0.006***	0.624***
	(0.005)	(0.002)	(0.002)	(0.035)
Large	0.047***	−0.029***	−0.006***	−0.381***
	(0.002)	(0.001)	(0.001)	(0.017)
V. Large	0.101***	−0.044***	−0.030***	−0.860***
	(0.023)	(0.006)	(0.005)	(0.113)
Country-Sector FE	Yes	Yes	Yes	Yes
N. firms	456,560	456,560	456,560	456,560
N. observations	456,560	456,560	456,560	456,560

This table reports a set of regressions where the dependent variable is either leverage measured as debt over total assets (column 1), profitability measured as return on assets (column 2), investment rate measured as investment over total assets (column 3), or average product of capital (APK) measured as value added over fixed assets (column 4). All regressions control for a dummy taking value one for connected firms, and country-sector fixed effects. The bottom panel separates the effect of political connections from that of state-ownership and controls for a dummy variable taking value one for young firms (defined as firms with less than 6 years of age), a dummy taking value one for firms with more than 250 and less than 10,000 employees (Large), and a dummy taking value one for firms with more than 10,000 employees (V. Large).
Robust standard errors are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In the next section, we probe further by using an econometric specification which allows testing whether politically connected firms have privileged access to credit, even after controlling for all unobservable firm-specific characteristics.

4. Political connections and financial constraints

4.1. Theoretical underpinnings

As discussed in Section 1, Fazzari et al. (1988) propose a test of credit constraints based on the sensitivity of investment to internally generated funds (measured by cash-flow) and suggest that a positive correlation between investment and cash flow is consistent with the presence of credit constraints.

Love (2003) builds on this idea and interacts cash-flow with country-specific variables in order to test whether these variables ameliorate credit constraints. Specifically, she builds a structural model of investment and shows that a linearization of the Euler equation yields an equation in which investment depends on its lagged value, sales growth, cash flow, the interaction between cash flow and a measure of credit availability, and a set of fixed effects.[13]

We follow Love (2003) and test whether politically connected firms are less credit constrained than unconnected firms by estimating the following model:

$$I_{i,t} = \alpha I_{i,t-1} + \gamma SG_{i,t} + CF_{i,t}(\delta + \beta PC_i) + +X_{i,t}\Gamma + \varphi_i + \xi_{c(i),s(i),t} + \epsilon_{i,t} \tag{2}$$

where $I_{i,t}$ is the investment rate (investment over total assets) for firm i (in country c) and year t, $SG_{i,t}$ measures firm-level sales growth and proxies for future investment opportunities, CF_{it} is cash flow over total assets, $X_{i,t}$ is a matrix that includes dummies measuring firm size and age, φ_i is a set of firm fixed effects, and all other variables are defined as in Eq. (1).

Note that Eq. (2) controls for firm fixed effects and hence does not allow estimating the main effect of political connections.[14] Instead, the political connection dummy is interacted with cash flow which varies across firms and across time. Hence, the interactive effect can be estimated even in the presence of firm fixed effects.

Before discussing the results, it is worth noting that Kaplan and Zingales (2000) criticized the original approach of Fazzari et al. (1988) by pointing out that cash flow could be a proxy for investment opportunities. Hence, its positive association with investment could be explained by the fact that cash flow has a direct effect on investment demand. One answer to this criticism is that, if

[13] Huang et al. (2020, 2018) use a similar model to test whether public debt tightens credit constraints.
[14] The effect of firm age can be estimated because in our sample there are firms that change age status.

Table 5
Political connections and financing constraints.

	(1)	(2)	(3)	(4)	(5)	(6)
$Investment_{t-1}$	−0.152***	−0.152***	−0.152***	−0.152***	−0.154***	−0.154***
	(0.045)	(0.045)	(0.045)	(0.045)	(0.042)	(0.042)
Sales growth	−0.045***	−0.045***	−0.045***	−0.045***	−0.044***	−0.044***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)
Cash flow	0.365**	0.366**	0.366**	0.366**	0.420**	0.420**
	(0.162)	(0.162)	(0.162)	(0.162)	(0.181)	(0.181)
Young	0.017***	0.017***	0.017***	0.017***	0.070**	0.070**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.030)	(0.030)
Cash flow × Connected		−0.398***	−0.396***	−0.395***	−0.397***	−0.436***
		(0.149)	(0.148)	(0.149)	(0.138)	(0.162)
Cash flow × Large			−0.133*	−0.132*		
			(0.077)	(0.079)		
Cash flow × V. Large			−0.252**	−0.251**		
			(0.118)	(0.119)		
Cash flow × Connected ×Large				−0.029		
				(0.130)		
Cash flow × Connected ×V Large				−6.450***		
				(0.957)		
Cash flow × Young					−0.236*	−0.237*
					(0.138)	(0.138)
Cash flow × Connected ×Young						0.138
						(0.093)
Country-Sector-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
N. firms	438,281	438,281	438,281	438,281	438,281	438,281
N. observations	1,625,491	1,625,491	1,625,491	1,625,491	1,625,491	1,625,491

This table reports a set of regressions where the dependent variable is investment scaled by total assets and the control variables are lagged investment, sales growth scaled by assets, cash flow scaled by assets a dummy variable taking value one for young firms (Young is equal to one for as firms with less than 6 years of age), a dummy taking value one for firms with more than 250 and less than 10,000 employees (Large), and a dummy taking value one for firms with more than 10,000 employees (V. Large). Firm fixed effects and country-sector-year fixed effects are also included. The interaction between Cash Flow and a dummy taking value one for politically connected firms and interactions between cash flow and each of firm age and firm size.
Robust standard errors clustered at the firm level are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

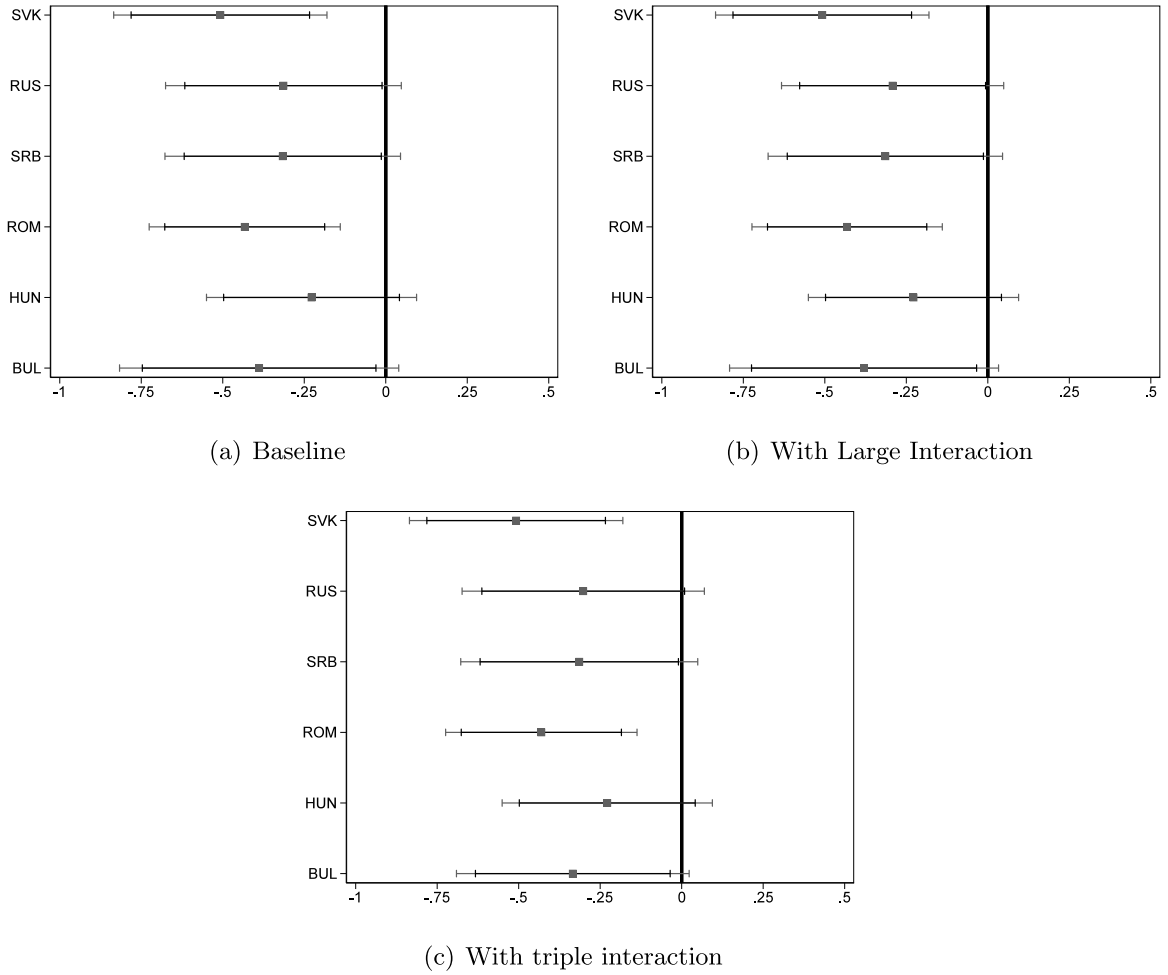
we were to find that this correlation varies across types of firms and tends to be higher for firms that are more likely to be credit constrained, it would then be possible to claim that this differential effect is a signal of the presence of credit constraints for these particular types of firms (Fazzari et al. (2000); see also Huang et al. (2020, 2018)). This is what we do in this paper. Even if cash flow is a proxy for investment opportunities, we see no reason why, in the absence of credit constraints, the direct effect of cash flow on investment should differ between connected and unconnected firms. Therefore, the finding that the correlation between investment and cash flow is lower for politically connected firms is likely to indicate that unconnected firms face tighter credit constraints.

4.2. Empirical results

In Eq. (2) the parameter δ measures the correlation between investment and cash flow for unconnected firms, and $\delta + \beta$ measures the correlation between investment and cash flow for politically connected firms. As discussed in the previous paragraph, unless cash flow is a better proxy of investment opportunities for connected firms than for unconnected firms, β is a good measure of the difference in the credit constraints faced by these two types of firms. A negative value of β would suggest that politically connected firms are less credit constrained than unconnected firms, conditional on all observable and unobservable time-invariant firm characteristics.

We start by estimating Eq. (2) without including the interaction between political connections and cash flow. This is the original model of Fazzari et al. (1988). We find that cash flow is positively and significantly correlated with investment: firms with available internal funds tend to invest more (column 1, Table 5). The point estimate implies that a 1% increase in the cash flow is associated with one-third of a percentage point increase in investment, corresponding to a 5% increase with respect to the mean value of 6%. This positive correlation can either indicate that in our sample cash flow is a proxy for future investment opportunities, that the firms in our sample are credit constrained, or both.

More interesting for our purposes is the finding that the interaction between cash flow and the political connection dummy is negative, statistically significant and large in absolute value (column 2, Table 5). In fact, the interactive effect has about the same size (but with the opposite sign) as the main effect. When we add the two estimated parameters, we find that the correlation between cash flow and investment for politically connected firms is essentially zero ($0.365 - 0.398 = -0.033$): for connected firms, changes in cash flow are uncorrelated with investment. This result suggests that politically connected firms are less credit constrained than unconnected firms. In fact, connected firms may not be credit constrained at all as there is no correlation between cash flow and



(a) Baseline

(b) With Large Interaction

(c) With triple interaction

Fig. 1. Political connections and financing constraints.

investment for connected firms. In other words, for a firm in our sample, being connected eliminates the need to finance investment with internal funds.

It is possible to think of firm characteristics that are jointly associated with the presence of political connections and credit constraints. Firm size is one of these characteristics. Hadlock and Pierce (2010) have shown that large firms are less likely to be credit constrained. If in our sample, politically connected firms are more likely to be large, the fact that large firms are less likely to be credit constrained could lead to a negative bias in our estimate of β as our political connection dummy could simply capture the effect of firm size.

To control for this possibility, we augment our model with a second set of interactions and allow the correlation between cash flow and investment to also vary with firm size. While we do find that connected firms are larger (8% of connected firms are classified as large or very large, while only 2% of unconnected firms are classified as large or very large) and that large and very large firms are less constrained than smaller firms, we also find that controlling for firm size does not alter our baseline results. Column 3 of Table 5 suggests that political connections and firm size are two separate and independent channels that alleviate credit constraints and reduce the need to finance investment with internal funds.

We also check whether our results are affected by augmenting our baseline model with two triple interactions ($CF \times Large \times PC$ and $CF \times V.Large \times PC$). The coefficients of the triple interactions capture whether political connections have a different effect in small and large firms. A negative coefficient would signal that connections are more helpful for large than small firms. We find that the triple interaction is not statistically significant for large firms but that it is negative and statistically significant for very large firms. Our results suggest that connections exert the same influence in large and small firms, but that they could be more important in very large firms. However, controlling for these triple interactions does not alter our baseline results (column 4, Table 5).

We repeat the same experiment by interacting cash flow with the young dummy and by also including the triple interaction between cash flow, political connection and the young dummy. The last two columns of Table 5 show that our results are robust to controlling for these interactions.

Table 6
Political connections and financing constraints, Diff-GMM estimator.

	(1)	(2)	(3)	(4)
Investment$_{t-1}$	0.004**	0.004**	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
Sales growth	−0.057***	−0.057***	−0.057***	−0.057***
	(0.002)	(0.002)	(0.002)	(0.002)
Cash flow	0.270***	0.271***	0.271***	0.271***
	(0.016)	(0.017)	(0.017)	(0.017)
Young	0.010***	0.010***	0.010***	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)
Cash flow × Connected		−0.324***	−0.323***	−0.324***
		(0.040)	(0.040)	(0.041)
Cash flow × Large			−0.067***	−0.068***
			(0.015)	(0.015)
Cash flow × V. Large			−0.252	−0.253
			(0.280)	(0.280)
Cash flow × Connected × Large				0.040
				(0.166)
Cash flow × Connected × V. Large				135.958*
				(72.181)
Country-Sector-Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
N. firms	417,412	417,412	417,412	417,412
N. observations	1,117,243	1,117,243	1,117,243	1,117,243

This table reports a set of regressions where the dependent variable is investment scaled by total assets and the control variables are lagged investment, sales growth scaled by assets, cash flow scaled by assets a dummy variable taking value one for young firms (Young is equal to one for as firms with less than 6 years of age), a dummy taking value one for firms with more than 250 and less than 10,000 employees (Large), and a dummy taking value one for firms with more than 10,000 employees (V. Large). The interaction between Cash Flow and a dummy taking value one for politically connected firms and interactions between cash flow and firm size. All models are estimated with the Arellano and Bond Difference estimator. Country-year-sector fixed effects are also included.
Robust standard errors clustered at the firm level are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.3. Robustness checks

While the standard fixed effects regressions of Table 5 provide a simple and transparent way to estimate Eq. (2), the joint inclusion of fixed effects and lagged dependent variables can lead to biased estimations (Nickell (1981) and Arellano and Bond (1991)). We address this issue by showing that our baseline results are robust to using the Arellano and Bond (1991) difference estimator (Table 6, these regressions also include country-sector-year fixed effects) and to estimating the model without the lagged dependent variable (Table 7). In both cases, we obtain coefficients for our main variable of interest which are similar to our baseline estimate of −0.398 (column 2 of Table 5). Specifically, −0.324 in the Arellano and Bond estimates of Table 6 and −0.385 in the model that does not include the lagged dependent variable (column 2 of Table 7). While in this paper we focus on the short-term effect of political connections, it is worth noting that Tables 5 and 6 also imply similar long-run effects of political connections.[15] Given that the results are similar in the rest of the paper we will use standard fixed effects regressions which allows us to also use firms for which we have less than three consecutive observations and that do not require arbitrary choices on the number of lags to be included in the set of instruments.

As final robustness check, we exclude state-owned enterprises from the group of politically connected firms. Table 8 shows that our results are robust to this alternative definition of political connections.

Next, we check whether our results are driven by a specific country by estimating the different models of Table 5 allowing different coefficients for the six countries included in our sample. The top left panel of Fig. 1 reports the results for the baseline model (this is equivalent to column 2 of Table 5).[16] It shows that the interactive effect is always negative, ranging between −0.22 for Hungary and −0.5 for the Slovak Republic. It is also statistically significant in 5 of the 6 countries included in our sample.[17] The substantial overlap of the confidence intervals indicates limited cross country heterogeneity in how political connections affect credit constraints in the six countries that we study.

Figs. 1(b) and 1(c) show that the results are unchanged if we control for the interaction between cash flow and firm size (the equivalent of column 3 in Table 5) and for the triple interaction among cash flow, firm size, and political connections (the equivalent of column 4 of Table 5).[18]

[15] The fixed effects regression implies a long run effect of −0.398/1.152 = −0.34 and the difference GMM implies a long run effect of −0.324/0.996 = −0.33.
[16] Full regression results are reported in Appendix Table A.3.
[17] The coefficient is not statistically significant in Hungary, which is the country with the lowest share of observations for politically connected firms. However, also in this case, the coefficient is not far from being statistically significant (the p value is 0.16).
[18] We also explored whether the results differ systematically across sectors, but we did not find any evidence in this direction (we would like to thank an anonymous referee for suggesting to explore possible heterogeneity across sectors).

Table 7
Political connections and financing constraints, without controlling for lagged investment.

	(1)	(2)	(3)	(4)	(5)	(6)
Sales growth	−0.046***	−0.046***	−0.046***	−0.046***	−0.045***	−0.045***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)
Cash flow	0.358**	0.358**	0.359**	0.359**	0.410**	0.410**
	(0.160)	(0.160)	(0.160)	(0.160)	(0.180)	(0.180)
Young	0.016***	0.016***	0.016***	0.016***	0.066**	0.066**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.030)	(0.030)
Cash flow × Connected		−0.385***	−0.383***	−0.383***	−0.384***	−0.419***
		(0.148)	(0.147)	(0.148)	(0.138)	(0.162)
Cash flow × Large			−0.135*	−0.135*		
			(0.076)	(0.077)		
Cash flow × V. Large			−0.251**	−0.250**		
			(0.118)	(0.118)		
Cash flow × Connected × Large				−0.018		
				(0.131)		
Cash flow × Connected × V. Large				−7.021***		
				(0.924)		
Cash flow × Young					−0.224	−0.224
					(0.138)	(0.138)
Cash flow × Connected × Young						0.122
						(0.093)
Country-Sector-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
N. firms	438,281	438,281	438,281	438,281	438,281	438,281
N. observations	1,625,491	1,625,491	1,625,491	1,625,491	1,625,491	1,625,491

This table reports a set of regressions where the dependent variable is investment scaled by total assets and the control variables are sales growth scaled by assets, cash flow scaled by assets a dummy variable taking value one for young firms (Young is equal to one for as firms with less than 6 years of age) a (time invariant), a dummy taking value one for firms with more than 250 and less than 10,000 employees (Large), and a dummy taking value one for firms with more than 10,000 employees (V. Large). The interaction between Cash Flow and a dummy taking value one for politically connected firms and interactions between cash flow and firm size. Firm fixed effects and country-sector-year fixed effects are also included.
Robust standard errors clustered at the firm level are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8
Political connections and financing constraints, excluding state-owned enterprises.

	(1)	(2)	(3)	(4)
Investment_{t-1}	−0.152***	−0.152***	−0.152***	−0.152***
	(0.045)	(0.045)	(0.045)	(0.045)
Sales growth	−0.045***	−0.045***	−0.045***	−0.045***
	(0.005)	(0.005)	(0.005)	(0.005)
Cash flow	0.365**	0.366**	0.366**	0.366**
	(0.162)	(0.162)	(0.162)	(0.162)
Young	0.017***	0.017***	0.017***	0.017***
	(0.002)	(0.002)	(0.002)	(0.002)
Cash flow × Connected, excl SOE		−0.393***	−0.390***	−0.387**
		(0.151)	(0.149)	(0.151)
Cash flow × Large			−0.133*	−0.131*
			(0.078)	(0.079)
Cash flow × Connected, excl SOE × Large				−0.139
				(0.126)
Country-Sector-Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
N. firms	438,281	438,281	438,281	438,281
N. observations	1,625,491	1,625,491	1,625,491	1,625,491

This table reports a set of regressions where the dependent variable is investment scaled by total assets and the control variables are lagged investment, sales growth scaled by assets, cash flow scaled by assets a dummy variable taking value one for young firms (Young is equal to one for as firms with less than 6 years of age) a (time invariant) dummy taking value one for firms with more than 250 employees (Large). The interaction between Cash Flow and a dummy taking value one for politically connected firms and interactions between cash flow and of firm size. The definition of politically connected firms does not include state-owned enterprises. Firm fixed effects and country-sector-year fixed effects are also included.
Robust standard errors clustered at the firm level are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

We now explore if different types of political connections have a differential impact on credit constraints faced by politically connected firms. On the one hand, a firm connected to a person in national government (as opposed to a local government) might have relatively easier access to finance, potentially due to the greater influence wielded by national politicians. On the other hand, lending decisions by local banks or even lending decisions by local branches of national banks might have direct links with local

Table 9
Alternative types of connections and financing constraints.

	(1)	(2)	(3)	(4)	(5)
Investment$_{t-1}$	−0.152***	−0.152***	−0.152***	−0.152***	−0.152***
	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)
Sales growth	−0.045***	−0.045***	−0.045***	−0.045***	−0.045***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Cash flow	0.365**	0.365**	0.366**	0.365**	0.366**
	(0.162)	(0.162)	(0.162)	(0.162)	(0.162)
Young	0.017***	0.017***	0.017***	0.017***	0.017***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Cash flow × Local Government	−0.453***				−0.454***
	(0.170)				(0.171)
Cash flow × State Government		−0.411***			−0.412***
		(0.151)			(0.152)
Cash flow × National Government			−0.389**		−0.389**
			(0.151)		(0.151)
Cash flow × State Enterprise				−0.290	−0.291
				(0.200)	(0.200)
Country-Sector-Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
N. firms	438,281	438,281	438,281	438,281	438,281
N. observations	1,625,491	1,625,491	1,625,491	1,625,491	1,625,491

This table reports a set of regressions where the dependent variable is investment scaled by total assets and the control variables are lagged investment, sales growth scaled by assets, cash flow scaled by assets a dummy variable taking value one for young firms (Young is equal to one for as firms with less than 6 years of age). The interaction between Cash Flow and a set of dummies taking value one for different types of politically connected firms. Firm fixed effects and country-sector-year fixed effects are also included.
Robust standard errors clustered at the firm level are reported in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

political communities.[19] Our results could also be driven by the fact that a number of politically connected firms are state-owned enterprises, and, in many countries, state-owned enterprises tend to have easier access to credit.

As our data allow to identify different types of political connections, we estimate separate models for four types of connections: (i) connections with the national government (this is the most common type of connection, 58% of connected firms have a link with an official in the national government); (ii) connections with state governments (in our sample, 31% of connected firms have a connection with an official in a state government); (iii) connections with local government (6% of connected firms belong to this group); and (iv) state-owned enterprises (3% of connected firms in our sample are state-owned enterprises).[20]

We first assume that only one type of connections matter and consider all firms that have other types of connections as unconnected, and then we jointly control separately for all types of connections. For instance, in column 1 of Table 9 we assume that the only connection that matters are connections to local governments and we consider firms with all other types of connections as unconnected. In column 2–4, we do the same for state government connections, national government connections, and state-owned enterprises. Finally, in column 5 we separately control for all these types of connections in the same regression.

We find that there are no differences across the different types of connection. As already shown in Table 8, the only type of connection that does not seem to matter is that goes through state-owned enterprises. All other types of political connections, irrespective of their exact nature, ease credit constraints with no economically or statistically significant difference in their impact. As before, we augment our specification in Table 9 with interaction terms that allow the correlation between cash flow and investment to vary with firm size. Table 10 shows that our baseline findings are robust to the inclusion of these additional interactive effects. The results are also robust to augmenting the model with a triple interaction differentiating firms that are both large and politically connected.[21]

[19] For a discussion on German savings banks and local politics, see Markgraf and Véron (2018).

[20] PEPs connected to sub-national government comprise: senior members of the executive, legislature, judiciary, and police of sub-national governments such as provinces, states, and regions within a national government; this category includes also senior civil servants, senior government officials at sub-national level, and senior executives of sub-national level state owned enterprises. PEPs connected to local government comprise: mayors and deputy mayors of local government, senior executives of state-owned enterprises administered or owned at the local level. We code these different categories using the politically exposed person primary affiliation. See Table 9 for details. The shares indicated in the text are for the pooled sample and vary across countries. These shares add 98% as there are a few small omitted groups (international organizations, regional organizations, and non-governmental organizations) accounting for 2% of the observations.

[21] While there is no variation in political connections over time in our sample, we attempt to explore the temporal variation using election year. Specifically, we check if the correlation between investment and cash flow is different during election years. In total, we have 12 elections years in our sample. We find that coefficient of the interaction term between cash flow and election year is negative but not statistically significant.

Table 10
Alternative types of connections, firm size, and financing constraints.

	(1)	(2)	(3)	(4)	(5)
$Investment_{t-1}$	−0.152***	−0.152***	−0.152***	−0.152***	−0.152***
	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)
Sales growth	−0.045***	−0.045***	−0.045***	−0.045***	−0.045***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Cash flow	0.366**	0.366**	0.366**	0.365**	0.366**
	(0.162)	(0.162)	(0.162)	(0.162)	(0.162)
Young	0.017***	0.017***	0.017***	0.017***	0.017***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Cash flow × Large	−0.136*	−0.135*	−0.134*	−0.136*	−0.133*
	(0.078)	(0.078)	(0.078)	(0.079)	(0.078)
Cash flow × V. Large	−0.251**	−0.251**	−0.251**	−0.251**	−0.252**
	(0.118)	(0.118)	(0.118)	(0.118)	(0.118)
Cash flow × Local Government	−0.453***				−0.454***
	(0.170)				(0.170)
Cash flow × State Government		−0.410***			−0.411***
		(0.151)			(0.151)
Cash flow × National Government			−0.386***		−0.387***
			(0.150)		(0.150)
Cash flow × State Enterprise				−0.289	−0.290
				(0.199)	(0.199)
Country-Sector-Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
N. firms	438,281	438,281	438,281	438,281	438,281
N. observations	1,625,491	1,625,491	1,625,491	1,625,491	1,625,491

This table reports a set of regressions where the dependent variable is investment scaled by total assets and the control variables are lagged investment, sales growth scaled by assets, cash flow scaled by assets a dummy variable taking value one for young firms (Young is equal to one for as firms with less than 6 years of age) a (time invariant), a dummy taking value one for firms with more than 250 and less than 10,000 employees (Large), and a dummy taking value one for firms with more than 10,000 employees (V. Large). The interaction between Cash Flow and a set of dummies taking value one for different types of politically connected firms and interactions between cash flow and firm size. Firm fixed effects and country-sector-year fixed effects are also included.
Robust standard errors are reported in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 11
Capital productivity and financing constraints.

	Full sample		Excl. Russian Fed.	
	APK	ROA	APK	ROA
Leverage	−1.187***	−0.135***	−1.194***	−0.135***
	(0.012)	(0.001)	(0.012)	(0.001)
Connected × Leverage	0.228	0.015	0.208	0.011
	(0.138)	(0.018)	(0.136)	(0.019)
Young	0.001	0.011***	0.001	0.011***
	(0.004)	(0.001)	(0.004)	(0.001)
Large	0.219***	0.006***	0.225***	0.006***
	(0.016)	(0.002)	(0.017)	(0.002)
V. Large	0.093	0.018	0.114	0.010
	(0.125)	(0.018)	(0.121)	(0.037)
Country-Sector-Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Mean dep. var.	0.36	0.12	0.44	0.12
N. observations	1,625,491	1,625,491	1,538,986	1,538,986

This table reports a set of regressions where the dependent variable is either the average product of capital (APK) or profitability (ROA) and the controls are leverage, the interaction between leverage and the political connection dummy, a dummy variable taking value one for young firms (Young is equal to one for as firms with less than 6 years of age), a dummy taking value one for firms with more than 250 and less than 10,000 employees (Large), and a dummy taking value one for firms with more than 10,000 employees (V. Large). The average product of capital (APK) is computed as $\frac{Valueadded}{FixedAssets}$; Value added is the sum of EBITDA and wages. For almost all Russian firms, value added is the sum of EBIT and wages. Firm fixed effects and country-sector-year fixed effects are also included.
Robust standard errors clustered at the firm level are reported in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 12
Capital productivity and financing constraints, first quartile of APK.

	(1)	(2)	(3)	(4)
	Full sample		Excl. Russian Fed.	
Investment$_{t-1}$	−0.159***	−0.176***	−0.153***	−0.171***
	(0.043)	(0.023)	(0.044)	(0.023)
Sales growth	−0.042***	−0.044***	−0.041***	−0.043***
	(0.004)	(0.004)	(0.004)	(0.004)
Cash flow	0.413***	0.278	0.420***	0.281
	(0.159)	(0.175)	(0.160)	(0.178)
Young	0.017***	0.019***	0.017***	0.019***
	(0.002)	(0.002)	(0.002)	(0.002)
Large	0.017***	0.009***	0.019***	0.010***
	(0.003)	(0.003)	(0.003)	(0.003)
V. Large	−0.003	−0.004	−0.016	−0.011
	(0.013)	(0.008)	(0.020)	(0.016)
Cash flow × Connected	−0.352***	−0.343**	−0.360***	−0.353**
	(0.131)	(0.142)	(0.132)	(0.144)
LAPK	0.133***		0.142***	
	(0.022)		(0.024)	
v Cash flow × LAPK	0.051		0.021	
	(0.082)		(0.087)	
Cash flow × Connected × LAPK	−0.042		−0.034	
	(0.078)		(0.080)	
LROA		−0.026		−0.027
		(0.030)		(0.031)
Cash flow × LROA		0.557**		0.553**
		(0.255)		(0.255)
Cash flow × Connected × LROA		−0.500***		−0.496***
		(0.165)		(0.162)
Country-Sector-Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
N. firms	438,281	438,281	414,516	414,516
N. observations	1,625,491	1,625,491	1,538,986	1,538,986

This table reports a set of regressions where the dependent variable is investment scaled by total assets. $LAPK$ All other variables are defined as in the previous tables.
Robust standard errors clustered at the firm level are reported in parenthesis. *** $p < 0.01$, **$p < 0.05$, *$p < 0.1$.

5. Political connections and capital misallocation

5.1. Profitability of connected firms

We now check whether political connections are associated with distortion in the allocation of capital and lower economy-wide efficiency, as one would expect if unconnected firms were more efficient than connected firms (see Akcigit et al. (2018) and Bellettini et al. (2014)).[22] If this were the case, we should find a negative correlation between leverage and average product of capital for connected firms.

We test this hypothesis by regressing the average product of capital on leverage, the interaction between leverage and political connection, a set of controls, and firm and country-year fixed effects:

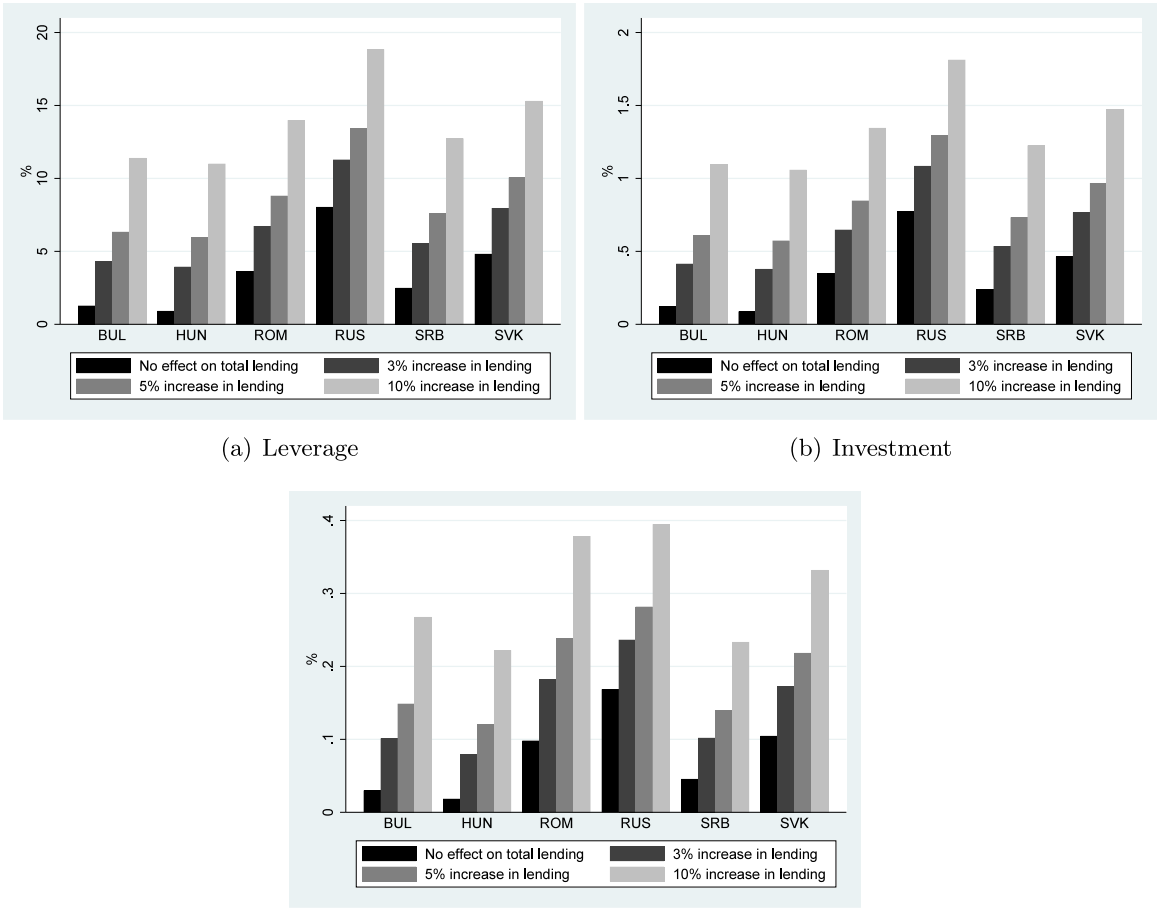
$$APK_{i,t} = LEV_{i,t}(\delta + \beta PC_i) + \mathbf{X}_{i,t}\Gamma + \varphi_i + \xi_{c(i),s(i),t} + \epsilon_{i,t} \tag{3}$$

where $APK_{i,t}$ is the average product of capital, $LEV_{i,t}$ is leverage, and all other variables are defined as before.

In this set up, a positive value of β would suggest that, when they borrow, politically connected firms use capital more efficiently with respect to unconnected firms, even after controlling for firm fixed effects.

We find that there is a negative and statistically significant correlation between leverage and the average product of capital, indicating that the average firm with access to credit does not allocate its capital well (column 1 of Table 11). What is interesting for our purposes is that β is not statistically significant. This result is consistent with the idea that connected firms that increase their leverage tend to decrease the efficiency of their investment like unconnected firms. Column 2 of Table 11 shows that we obtain similar results if, instead of focusing on the average product of capital, we look at profitability (ROA).

[22] Table 3 shows that connected firms are less profitable and have a lower average product of capital.



(a) Leverage

(b) Investment

(c) GDP growth

Fig. 2. Counterfactual analysis.

As there are several issues with the computation of the average product of capital for Russian firms, in columns 3 and 4 of Table 11 we show that the results are robust to dropping Russian firms from the sample.[23]

To probe further, we also test whether political connections are particularly useful for poorly performing firms by estimating the following model:

$$I_{i,t} = \alpha I_{i,t-1} + \gamma SG_{it} + CF_{i,t}(\delta + \zeta LAPK_{i,t} + PC_i(\beta + \theta LAPK_{i,t})) + \lambda LAPK_{i,t} + \mathbf{X}_{i,t}\Gamma + \varphi_i + \xi_{c(i),s(i),t} + \epsilon_{i,t} \quad (4)$$

where $LAPK_{i,t}$ is a dummy variable identifying firms with an average product of capital below the 25th percentile of the country-year specific sample of firms.

Within this setup, a positive value of λ suggests that firms with lower capital productivity tend to overinvest, a positive value of ζ suggests that unconnected firms with low capital productivity face tighter credit constraint and a negative value of θ suggests that political connections are particularly useful for firms with a low capital productivity.

The results of columns 1 and 3 of Table 12 provide some evidence that political connections are particularly useful for firms with low capital productivity. However, while θ is always negative, it is not statistically significant at conventional confidence levels.

We also estimate Eq. (4) by substituting the average product of capital with returns on assets (ROA). Columns 3 and 4 of Table 12 show that θ is now negative and statistically significant, indicating that political connections are particularly useful for firms with low profitability.

[23] There are two difficulties associated with the calculation of value added for Russian firms. First, data on wages are largely missing. We replace missing values with the average (at the year-main section NACE level) wages for the period 2008–2013. As this is an imprecise way to measure wage costs, measurement error is a serious concern. Second, data on depreciation and amortization are also often missing, forcing us to replace EBITDA with EBIT.

Table A.1
Observations lost during data cleaning process.

Reason	N. obs dropped	% not connected	% connected
Negative sales	6276	99.75	0.25
Negative total assets	1960	99.59	0.41
Negative fixed assets	20,038	99.66	0.34
Negative number of employees	0	0.00	0.00
Unusually large n. of empl. ($> 2,000,000$)	21	100.00	0.00
Missing id	0	0.00	0.00
Unit consistency check	196,436	99.33	0.67
Total assets are zero or missing	19,582,842	99.23	0.77
Negative cost of employees	9665	99.42	0.58
Negative cost of goods	270	94.81	5.19
Negative debt	18,989	99.49	0.51
Negative liabilities	11,436	99.45	0.55
Negative equity	3,234,575	99.62	0.38
Negative cash flow	2,818,614	99.44	0.56
Negative operating revenues	2248	99.51	0.49

Reasons "Negative sales" - "Negative cost of goods" are based on Kalemli-Özcan et al. (2015).

Table A.2
Coverage in total economy based on gross output.

	2008	2009	bf 2010	2011	2012	2013
	Panel A: all firms					
Bulgaria	45.6	49.2	49.3	49.5	55.5	53.5
Hungary	55.6	65.4	69.9	62.4	73.4	75.1
Romania	54.2	65.7	61.7	60.2	69.7	68.0
Slovakia	62.9	69.1	61.6	65.5	71.9	65.6
	Panel B: Not connected firms					
Bulgaria	45.6	49.2	49.3	49.5	55.5	53.5
Hungary	55.6	65.4	69.9	62.4	73.4	75.1
Romania	54.2	65.7	61.7	60.2	69.7	68.0
Slovakia	62.9	69.1	61.6	65.5	71.9	65.6
	Panel C: Connected firms					
Bulgaria	45.6	49.2	49.3	49.5	55.5	53.5
Hungary	55.6	65.4	69.9	62.4	73.4	75.1
Romania	54.2	65.7	61.7	60.2	69.7	68.0
Slovakia	62.9	69.1	61.6	65.5	71.9	65.6

Coverage is assessed by comparing turnover data from the subset of sectors included in both data sets, Eurostat and Orbis. The approach mimics that of Kalemli-Özcan et al. (2015). Data for Russia and Serbia is not available in Eurostat.

5.2. Welfare analysis

So far, we saw that connected firms borrow more than unconnected firms[24] and that the link going from being a connected firm to ability to borrow is not driven by unobserved heterogeneity. We also saw that, even though they are more leveraged, connected firms do not invest more than unconnected firms. Connected firms are also characterized by lower levels of profitability – as measured by their return on assets – and less efficient investment strategies — as measured by their average productivity of capital. Taken together, our results document that political connections distort capital allocation.

We now conduct a series of back-of-the-envelope calculations aimed at assessing whether this process of credit misallocation could have a quantitatively important effect on economic growth. It should be highlighted that these calculations are based on simple correlations. Hence, this section does not make any claim of causality.

We start with the assumption that if connected firms did not have a preferential treatment, connected and unconnected firms would have the same leverage. In fact, the leverage of connected firms should be lower, given that they are less productive and profitable than unconnected firms. Nevertheless, we adopt a conservative assumption of equal leverage. If this indeed is the case, and if total credit remains constant, we should observe a redistribution of credit from connected to unconnected firms. The amount of this redistribution depends on the difference in leverage between connected and unconnected firms as well as on the total share of credit captured by connected firms in each economy that we study. The black bars of Fig. 2(a) show that the effect would be negligible for Bulgaria, Hungary, Serbia and Slovak Republic (the bars are almost invisible in these countries), but very large for Romania and the Russian Federation (15% and 40%, respectively).

[24] The leverage of connected firms is about 6.5 times higher than that of unconnected firms.

Table A.3
Political connections and financing constraints: Cross-country heterogeneity.

	(1)	(2)	(3)
Investment$_{t-1}$	−0.153***	−0.153***	−0.153***
	(0.045)	(0.045)	(0.045)
Sales growth	−0.045***	−0.045***	−0.045***
	(0.005)	(0.005)	(0.005)
Cash flow	0.367**	0.367**	0.367**
	(0.160)	(0.161)	(0.161)
Young	0.017***	0.017***	0.017***
	(0.003)	(0.003)	(0.003)
Cash flow × Connected, BG	−0.374*	−0.366*	−0.324*
	(0.221)	(0.214)	(0.184)
Cash flow × Connected, HU	−0.225	−0.225	−0.225
	(0.163)	(0.163)	(0.163)
Cash flow × Connected, RO	−0.428***	−0.427***	−0.425***
	(0.151)	(0.151)	(0.152)
Cash flow × Connected, RS	−0.320*	−0.318*	−0.317*
	(0.185)	(0.184)	(0.186)
Cash flow × Connected, RU	−0.325*	−0.303*	−0.307
	(0.183)	(0.173)	(0.188)
Cash flow × Connected, SK	−0.504***	−0.504***	−0.504***
	(0.169)	(0.169)	(0.169)
Cash flow × Large, BG		−0.089	−0.086
		(0.078)	(0.078)
Cash flow × Large, HU		−0.054	−0.055
		(0.066)	(0.066)
Cash flow × Large, RO		−0.106*	−0.104*
		(0.061)	(0.063)
Cash flow × Large, RS		−0.126	−0.125
		(0.101)	(0.103)
Cash flow × Large, RU		−0.208*	−0.209*
		(0.122)	(0.124)
Cash flow × Large, SK		−0.170***	−0.171***
		(0.058)	(0.059)
Cash flow × Connected ×Large, BG			−0.467
			(0.660)
Cash flow × Connected ×Large, HU			1.128***
			(0.068)
Cash flow × Connected × Large, RO			−0.091
			(0.131)
Cash flow × Connected × Large, RS			−0.074
			(0.400)
Cash flow × Connected × Large, RU			0.039
			(0.200)
Cash flow × Connected × Large, SK			0.135
			(0.173)
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
N. firms	438,284	438,284	438,284
N. observations	1,625,502	1,625,502	1,625,502

This table reports a set of regressions similar to the baseline models of Table 5, but allowing for country-specific interactive effects.
BG stands for Bulgaria, HU for Hungary, RO for Romania, RU for Russian Federation, SK for Slovak Republic. Robust standard errors clustered at the firm level are reported in parenthesis. *** $p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Next, we assume that this increase in leverage is translated into an increase in investment equal to the country-specific correlation between leverage and investment in our sample of unconnected firms. This correlation ranges between 7% in Serbia and 12% in the Slovak Republic (the correlation between investment and leverage in the full sample of firms is 10% and that for the full sample of connected firms is close to zero). Using this assumption, we estimate that in Romania and the Russian Federation a reallocation of credit from connected to unconnected firms would lead to an increase in investment that ranges between 1.4% and 5% (see the black bars of Fig. 2(b)).

Finally, we use the share of investment of GDP in our sample of countries to estimate the growth effect of this counterfactual reallocation of credit and find a potential growth effect in Romania and Russian Federation that ranges between 0.4 and one percentage points. Notice that here we are estimating a pure partial equilibrium demand effect based of GDP accounting. If investment affects future growth and if private investment is especially effective in increasing future growth, the growth effect of credit reallocation could be much larger.

Moreover, we have seen that connected firms tend to have low levels of profitability. It is thus possible that if banks were not under pressure to lend to these firms, they could devote more resources to unconnected and profitable firms. This could promote financial depth, and total lending to these firms could increase by more than the reduction in credit to connected firms.

The gray bars of Fig. 2(a) show what would happen if total credit to unconnected firms were to increase by either 3%, or 5%, or 10% (lighter shades of gray are associated with higher increases of credit), and the bars in Figs. 2(b) and 2(c) of the figure plot the corresponding effects on investment and growth. The figure shows that, under the most optimistic scenario, GDP growth could increase between one-fifth of a percentage point in Bulgaria, Hungary, Serbia and the Slovak Republic and 1.4 percentage points in the Russian Federation. Thus, providing suggestive evidence for the economic growth impact of the credit misallocation documented above.

6. Conclusions

Using firm-level data, we develop an empirical strategy to examine if politically connected firms have easier access to external finance than unconnected firms. We start by documenting that politically connected firms: (i) have high levels of leverage; (ii) have low levels of profitability; (iii) have low average productivity of capital; and (iv) do not invest more than unconnected firms.

The fact that connected firms have more debt, while having similar investment rates and lower average productivity of capital than unconnected firms, suggests that connected firms do not always borrow to invest and when they do invest, they are likely to misallocate capital.

Motivated by these facts, we ask whether politically connected firms borrow more because they have easier access to credit. We test this hypothesis by checking whether connected firms are less likely to rely on their own internally generated funds for undertaking investment and find evidence in this direction. Firms without political connections must rely on their own cash flow to overcome credit constraints. These constraints are not only statistically significant, but also economically relevant. An unconnected firm able to increase its cash flow by 1% is able to boost its investments by more than one-third of a percentage point. This is equivalent to a 5% increase, when compared to the average rate of investment in these economies which is about 6%. We find that for connected firms the correlation between cash flow and investment is basically zero. This indicates that this group of firms can finance investment irrespective of internal funds availability.

We explore the welfare implications of our findings by checking if political connections lead to misallocation of capital. We find some evidence that low profitability firms tend to benefit the most from political connections, by experiencing disproportionally larger reductions of credit constraints.

Our findings open a few avenues for future research. The evidence that access to credit may be a mechanism through which political connections generate an unlevel playing field does not imply that this is the only, or the most important, mechanism. It is likely that firms with political connections obtain additional benefits in terms of lenient applications of laws and regulations, lower tax rates, access to cheaper imported inputs, protection from foreign or domestic competition, or privileged access to public procurement. Future research could test some of these mechanisms and provide better estimates of the welfare costs of political connections.

A second avenue for future research relates to finding a source of exogenous variation of connections which would allow to make stronger causal statements (see, for instance, Jones and Olken (2005)). We explored whether winning an election and becoming an active PEP could have a discernable impact, but our data did not allow us conducting a detailed exploration of the dynamic of political connections.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

See Tables A.1–A.3.

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