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Following Rajan and Zingales's (1998) pioneering study, many empirical studies have tested the differential growth effects of a country's financial development across various industries with different levels of dependence on external financing. To conduct this test, many researchers have used the Rajan Zingales (1998) exogenous indicator to measure each industries' external financial dependence, which is computed using balance-sheet data from quoted US firms from the 1980's As shown in the literature, this indicator might create bias when estimating the relationship between a country's financial development and its economic growth. We suggest a new indicator based on the new EU-Efige/Bruegel-UniCredit survey database, which explicitly asks entrepreneurs to indicate their perception of the industry's need for external financing. We then estimate the relationship between financial development and economic growth by analyzing a sample of Central and Eastern European economies during the past decade.

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1. Introduction and motivation

Since Goldsmith's (1969) pioneering study a large body of economic literature has focused on the role of financial development in fostering economic growth, and finding a strong positive correlation between the two. However, earlier studies of the finance-growth nexus suffer from identification and endogeneity issues because the direction of the causal relationship can be reversed. Instead of financial development causing economic growth, it is possible that economic growth spurs the development of financial institutions and increases their efficiency.[1]

One of the main contributions to the research is Rajan and Zingales's (1998, henceforth RZ) seminal study, as it proposes a difference-in-difference approach to analyze the relationship between the financial development of countries and their industry-level growth. Their methodology i) tries to resolve the reverse causality problem by focusing on the mechanisms through which finance influences growth and ii) avoids potential model misspecifications, as it includes industry and country fixed effects.

In particular, RZ's work tests the following hypothesis: in the presence of financial constraints to economic growth, a more developed financial system will facilitate a firm's access to sources of external financing. Thus, in the long run, firms that depend heavily on external financing – that are generally also more innovative - will experience greater benefits from their country's financial development. Estimating the interaction effects between a measure of a country's financial development and an industry-specific indicator of external financing needs, allows the differential growth effects of financial development across industries to be captured.[2] In other words, RZ verify whether industries that are more dependent on external financing grow more quickly when they operate in more financially developed countries. With this aim, they estimate the following model specification:[3]

$$VA\_Growth_{c,i} = \alpha + \eta_1 C_c + \eta_2 I_i + \beta_1 Industry\_Share\_VA_{c,i} + \beta_2 (Credit\_GDP_c * FD_i) + \varepsilon_{c,i} \quad (1)$$

where the dependent variable *VA_Growth* is the industry's compounded average growth rate in any industry *i* in country *c*. C and I are country *c* and industry *i* fixed effects, respectively. *Industry_Share_VA* is the share of each industry *i* value added over the total manufacturing value added in country *c*: the inclusion of this control variable considers the different industrial specializations that can drive differences in cross-country growth potential. *Credit_GDP* is the ratio of private credit to GDP (or other measures of financial development) in any country, *c*, taken at the beginning of the period of analysis. *FD* is the industry-specific indicator for external financial dependence, computed for each sector *i*.

In particular, the RZ's *FD* indicator is defined as the industry *i*'s median firm's share of capital expenditures that are not financed by internally generated cash flows for a sample of quoted firms in the US over a 10-year period (1980-1990). RZ's assumption is that the US has the most advanced financial system (i.e. it is a benchmark economy), and that, in the US, a firm's choice of external financing depends only upon technological factors and not upon differences between credit supply and demand. Thus, a cross-country estimation of the differential effects of financial development across industries with different values of their

[1] For a review of the literature on the finance-growth nexus, see Levine (2005).

[2] As Fisman and Love (2007) argue, the approach proposed by RZ might not capture the short-run effects of financial development on economic growth; Fisman and Love assert that "[…] financial development should increase an economy's resource allocation to any firm or sector with good growth opportunities and not only to those with high 'external financial dependence', as suggested by Rajan and Zingales" (pages 471-472).

[3] RZ use a sample of 36 industries across 41 countries. They find that the coefficient of the interaction term between a measure of a country's financial development and an industry-specific indicator of external financial dependence is positive and statistically significant at the 1% level.

external financial dependence indicator reduces identification problems, as the US is excluded from the analyzed sample and the indicator of external financial dependence enters the estimated equation as an exogenous variable.
One possible criticism of this approach is actually based on the fact that the indicator of external financing is computed using only US firms. US firms can be considered an "extreme benchmark", as the US represents an economy that might be significantly different from most of the economies included in studies analyzing samples of countries with different levels of economic development. In fact, we should note that i) firms from other countries (especially from emerging countries) are unlikely to have the same technological characteristics as those in the US, even in relative terms, i.e. when compared to firms in other industries within the same country, also because ii) countries with underdeveloped financial sectors tend to specialize in less finance-intensive activities.
Demirgurc-Kunt and Maksimovic (1998), for example, consider the RZ's assumption regarding the amount of external financial dependence shared within the same industries across different countries as too strong. They claim that firms operating within the same industry but in different countries can adopt different technologies because of the different demand, profits or comparative advantages. To test this assumption, they calculate the potential growth rate that each firm could obtain using only the internal funds (or internal funds plus short-term borrowing) and compare it with the actual growth of the firm. If a firm's actual growth rate exceeds its potential growth rate, then they assume that the firm is using sources of external financing. Next, at the aggregate level, they compute the proportion of firms that use external financing in each country. Using several measures of financial development, they find that the proportion of firms growing at a rate above the potential growth rate which they could obtain using only internal funds is positively correlated with measures of the country's stock market liquidity and financial development.
Ciccone and Papaioannou (2010) show that studies utilizing RZ's indicator of external financial dependence might lead to biased evidence. To explain the cross-industry and cross-country growth rates, they suggest that the interaction between the industry-country's actual need for external financing and the country's level of financial development should be analyzed, and that RZ's industry-specific original indicator (computed on US firms) should be used as an instrumental variable to reduce potential endogeneity for the indicator of the actual external financing needs.
In this work, we employ a model specification à la RZ, similar to equation (1), but we remove the hypothesis that the indicator of external financial dependence must be calculated on balance-sheet data for listed firms. In fact, we propose a new indicator that takes into account the need for external finance for all sized firms, constructed using data from the EU-Efige/Bruegel-UniCredit survey, which explicitly asks interviewed entrepreneurs to describe their perception of the typical firm's external financial dependence for the industry in which they operate.
With this aim, we investigate a sample of 14 manufacturing industries in five Central and Eastern European Countries (CEEC) during the period 2000-2007, and we estimate the differential growth effects of financial development across countries and industries, ranking the industries according to an indicator of financial dependence, which is defined as the industry-average perception of German companies.[4] In fact, we believe that the trade-off between the need to compute an indicator of external financial dependence on a benchmark economy (i.e., using a financially developed country to avoid taking into account the influence of credit market barriers on a firm's leverage decisions) and the need for a representative benchmark economy (i.e., an economy whose industries' needs for external

[4] Other studies of the finance-growth nexus use benchmarks other than the US, even in an empirical framework à la RZ: see, for example, Giannetti and Ongena (2009) and Fernandez de Guevara and Maudos (2011).

financing and technology do not radically differ from those of the analyzed sample) might be resolved by utilizing a "less extreme" benchmark than that represented by the US, especially if the economies analyzed differ from the US in terms of economic development.
There are still few analyses (e.g., Caporale et al. 2009, Backé et al. 2007, Guiso et al. 2004) of the finance-growth nexus in the CEEC area, which is, however, particularly interesting, because it experimented with a large transformation in the banking sector from the mid-1990s. Most of the previous works found a positive relationship between finance and development, but some (e.g., Coricelli et al. 2008, Moretti 2012) highlighted the presence of non-linear effects of financial development on economic growth in transition countries. This non-linear relationship is actually the issue that we will test in this work.[5]
The remainder of this paper is structured as follows. In Section 2, we introduce our survey-based indicator of external financial dependence. In Section 3, we discuss our main estimation results, and in Section 4, we deliver further evidence on the relationship between financial development and financial constraints using firm-level data for a larger sample of countries. Section 5 delivers our conclusion.

2. Firms' perception of external financial dependence

As already explained, RZ calculate their indicator of financial dependence (henceforth called *RZFD*) as the industry's median firm's share of capital expenditures that is not financed by internally generated cash flows over a 10-year period (1980-1990) using the balance-sheet data of US listed firms. Their indicator has some possible drawbacks - apart from the main criticisms that are noted in the cited literature - related to its computation on balance-sheet data. First of all, balance-sheet data can embed cyclical economic and financial effects. To avoid this problem, RZ calculate the *RZFD* index over a 10-year period, but the indicator can still be affected by different cyclical points (upturns and downturns), and it might not represent the effective need of external financing of different industries. Furthermore, the costs embedded in production can substantially change over a decade, because of the technological evolution, but this is not well represented by a ten years average index. Finally, to avoid supply side effects that are potentially embedded in the financial results, the *RZFD* indicator is calculated only on US quoted firms, with the assumption that they are not financially constrained. RZ's argument is, in fact, that US listed firms face a perfect capital market: banks are prone to giving them credit, and they can raise funds on the stock market. Again, this assumption might be too strong as the industries' actual need for external financing might be different across countries.
For all of these reasons, we propose a different indicator for financial dependence using firms' direct perception of their industry's financial dependence rather than balance-sheet data. We use the survey data collected from the "European Firms in a Global Economy" project (EU-Efige/Bruegel-UniCredit survey).[6] The survey includes a specific question regarding each sector's dependence on external financing and asks each entrepreneur in the sample to assign a score ranging from 1 to 5 to indicate the financial dependence level of the industrial sector in which the firm operates (henceforth called individual perception of

[5] Rioja and Valev (2004a, 2004b) also find that financial development has positive effects on productivity growth only for developed countries and that there exist levels of financial development (such as its lower levels) where the effect on growth might be negative. See, also, Stengos et al. (2007) for a discussion on the non-linearity of the finance and growth relationship and competing evidence about the linearity of this relationship.
[6] This survey involves approximately 15,000 firms operating in seven European countries: Austria, Germany, France, United Kingdom, Italy, Spain and Hungary. Around 3,000 firms for each country were interviewed, with the exclusion of those from Austria and Hungary (both countries have approximately 500 firms in the sample). Covering a wide variety of each firm's activities, the questionnaire contains a section on the role of finance and on the bank-firm relationship.

financial dependence, or *IFD*).

The indicator of external financial dependence that we will use in the model specification is hence calculated as the industry average of the *IFD* variable (standardized using a min-max criterion)[7] for each country (henceforth called Efige/Brugel-Unicredit financial dependence indicator, or *EFD*).[8] One of the primary implications of using this survey's information is that we can include all firms' size classes in our index. From our point of view, using balance-sheet data has the primary drawback of including possible supply side effects, which is why the *RZFD* is calculated on listed firms, with the assumption that they are not subject to credit supply restrictions. However, this assumption is the same as assuming that the external financial needs of listed firms are the same as those of the entire corporate sector, independent of the firms' size or composition. To us, this does not realistically represent the financial needs associated with technological stages of development. On the contrary, because entrepreneurs well understand the financial needs of their business, the collection of individual perceptions should, in principle, better reflect the country's production structure.

Nevertheless, before proceeding with the estimation of our model specification, similar to equation (1), we need to verify that the entrepreneurs' answers are independent from their firms' financial situation. To verify whether the indicator of the individual perception of external financial dependence (*IFD*) is affected by the individual financial situation or by the industry's characteristics, we regress *IFD* on a set of industry dummies and on the amount of leverage at the beginning of the observed period.[9]

Table 1. Ordered logit estimation: Entrepreneur's perception of financial dependence (*IFD*)

	All Efige countries		*Germany*	
	(1)	(2)	(3)	(4)
Leverage 2007	0.0002		0.0002	
	(0.0002)		(0.0002)	
Leverage 2008		0.0001		0.0006
		(0.0002)		(0.0006)
Industry FE	YES	YES	YES	YES
Obs.	12,442	11,866	2,112	2,065
Pseudo-R2	0.23	0.23	0.93	0.94

The dependent variable is the entrepreneur's perception of industry's external financial dependence.
Standard errors in parenthesis. Significance level: ** p<0.05.

The estimation results (Table 1, columns 1 and 2), using an order logit regression, show that the entrepreneur's perception of industry's financial dependence was not significantly related to his firm's leverage, confirming that the declarations of entrepreneurs about the industrial needs for external finance were not influenced by their individual financial needs, here represented by a leverage indicator (defined as the firm's debt/equity ratio). Moreover, the regression results show that the industry-level dummies help explain our dependent variable

[7] To make the variable *IFD* easily comparable within the finance-growth nexus analysis, we standardize it using the min-max standardization criterion. In doing so, we generate a variable ranging from a minimum value of 0 to a maximum value of 1, as shown by the following equation: $IFD_{f,c} = (X_{f,c} - X_{min,c})/(X_{max,c} - X_{min,c})$, where $IFD_{f,c}$ is the new standardized variable of individual perception of financial dependence, $X_{f,c}$ is the score assigned by each firm *f* to the financial dependence of its industry in country *c*, and X_{min} and X_{max} are, respectively, the minimum and maximum values of financial dependence in each country *c*.

[8] For the estimates of the model, we need to provide an industry index ($EFD_{i,c}$) defined as the mean of (the standardized) $IFD_{f,c}$ by sector *i* and country *c*.

[9] We consider 2007 leverage (Table 1 columns 1 and 3) and, as a robustness check, we also regressed the *IFD* indicator on 2008 leverage (Table 1 columns 2 and 4).

and confirm that it is strictly driven by sectoral effects.[10] This relationship is what we would expect from the questionnaire, which asks for the financial dependence level with respect to industrial needs, and not with respect to individual situations.

As shown in Table 1, columns 3 and 4, we also run an ordered logit regression on the subsample of German firms, as Germany represents our benchmark economy for the following analysis. Estimation results confirm the previous evidence, and the industry fixed effect significance also confirms the sectoral nature of the financial dependence variable.

As previously underlined, in order to have an indicator comparable to that of RZ, we compute our *EFD* indicator of external financial dependence as the industry's mean of the entrepreneurs perception of the industry's external financial dependence (*IFD*) for each country. In the following estimation we then use Germany as the benchmark economy as it might be considered closer (not only geographically) to the CEEC. Germany can represent the European benchmark, being the largest economy in Europe, and it displays a productive structure much more similar to CEEC than that of the US or of other EU countries.[11] This benchmark might allow us to reduce, at least partially, the potential bias noted by Ciccone and Papaioannou (2010), who show that assuming the US to be the benchmark economy can generate a bias in the estimation; they suggest using the US-based *RZFD* indicator as an instrumental variable for the industries' actual financial dependence. Because the EU-Efige/Bruegel-Unicredit survey does not have data for all of the CEEC on which we focus the analysis, it is not possible to directly apply the Ciccone and Papaioannou (2010) approach, and we opt for an "intermediate solution", considering as benchmark a more similar economy, such as Germany can be for the CEEC countries.

Because the differences between countries can be relevant, we compare - through the rank correlation calculation (Spearman correlation) - the industrial average of our financial dependence indicator for the total sample coved by the survey (*EFD-TOT*), for Germany (*EFD-DE*) and for Hungary (*EFD-HUN*), which is the only country belonging to the area of analysis (CEEC). As shown in Table 2, the rank correlation between German and Hungarian external financial dependence is positive and statistically significant at 5% level. Similarly, the rank correlation between these two countries and the total sample is positive and statistically significant. Moreover, the correlation in Table 2 includes the *RZFD* indicator, which is not significantly correlated with either our total survey's index *EFD-TOT* or with the indexes calculated at country level (*EFD-DE* and *EFD-HUN*). This lack of correlation confirms either a difference due to the survey and the balance-sheet nature of the indicators or, as we are more inclined to think, a gap due to the differences between European and the US economies.

Table 2. Rank-correlation between industry's external financial dependence across countries

	RZFD	*EFD-TOT*	*EFD-DE*	*EFD-HUN*
RZFD	1			
EFD-TOT	0.00391	1		
EFD-DE	0.1324	0.7319**	1	
EFD-HUN	0.2136	0.6687**	0.4944**	1

Significance level: ** $p<0.05$.

[10] Industry dummies are jointly significant at 1% level. Note that we do not include country dummies because the dependent variable has already been standardized through min-max criterion.

[11] Note that the industries' share of value added in Germany is positively correlated with all CEEC analyzed (i.e., they have a similar distribution of activities across manufacturing industries).

3. Estimation results

Following the model specification proposed by RZ (equation 1), we determine whether a larger banking sector has an effect on industry value-added growth. Specifically, we determine the differential growth effects of an indicator of financial development across industries with different dependence of external finance. We are interested in the effect of the interaction term between the private credit to GDP indicator (*Credit/GDP*), taken at the beginning of the period (2000), and our industry-specific indicator of external financing of German firms (*EFD-DE*), on average growth rates (*VA_Growth*) for 14 manufacturing industries in 5 CEEC (i.e., Czech Republic, Estonia, Hungary, Slovak Republic, and Slovenia) during the period 2000-2007.[12]

Undoubtedly, factors other than financial development influence industry performance. Thus, the following controls are included in the model specification: the share in terms of value added (*Industry_Share_VA*) of each industry *i* over the manufacturing value added in country *c* - to account for the different industrial specializations that may drive differences in growth potential across countries - as well as country (C) and industry (I) fixed effects - to prevent model misspecifications and other problems that may stem from omitted variables.

Table 3. Estimation results: cross-industry cross-country value added growth rates (*VA_growth*)

	5 CEEC		*5 CEEC + EU15*		
	(1)	(2)	(3)	(4)	(5)
Industry_Share_VA	-0.32142	-0.29390	-0.21512**	-0.20990**	-0.21322**
	(0.231)	(0.224)	(0.085)	(0.085)	(0.083)
(Credit/GDP) * EFD-DE	-0.00671	-0.31461**	-0.00159	-0.00959	-0.07846***
	(0.009)	(0.139)	(0.001)	(0.006)	(0.029)
$(Credit/GDP)^2$ * EFD-DE		0.00395**		0.00005	0.00105**
		(0.002)		(0.000)	(0.000)
$(Credit/GDP)^3$ * EFD-DE					-0.00000***
					(0.000)
Country FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Obs.	103	103	323	323	323
R^2	0.703	0.723	0.603	0.604	0.614

The dependent variable is the value added average growth rate (*VA_growth*) in industry *i* country *c* during 2000-2007.
Standard errors in parenthesis. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Columns 1-2 of Table 3 display the results of our analysis for the sample used. Our findings show that financial development has a non-linear effect on economic growth. This effect is negative and statistically significant at the lower levels of the private credit to GDP ratio, and

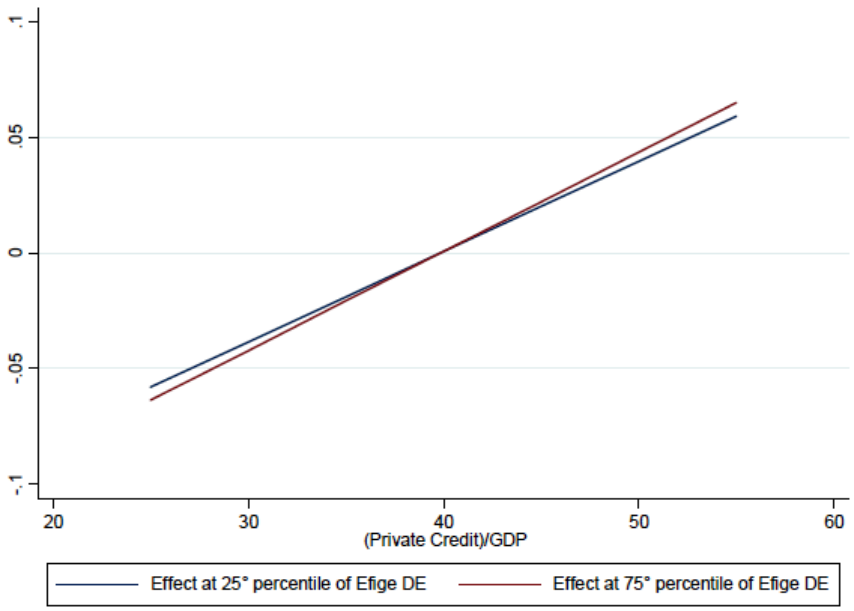
[12] For the value-added data, we employ the OECD-STAN industry-level data. Future versions of this work will employ alternative sources of data and include other countries. Descriptive statistics of real value-added average growth rates for our sample show a mean value of 7.2% and a standard deviation value of 0.09. The distribution shows the presence of extreme values and outliers; thus, in this section, we show estimation results obtained by running robust regressions (i.e., using the Iteratively Re-weighted Least Squared estimator, which iteratively assigns lower weight to extreme observations). Data for the private credit to GDP ratio are from the Financial Structure database of the World Bank (see Beck et al., 2000). Values of (*Credit_GDP*) for these countries are taken for the year 2000 (i.e. at the beginning of the period of analysis to mitigate endogeneity problems) and range from 27% for Hungary to 51% for the Slovak Republic. Note that currently the value of this variable is much higher for some countries (e.g., for Slovenia and Estonia).

it becomes positive and statistically significant at the higher levels. In particular, we find that the threshold value of the private credit to GDP ratio above which the effect of this variable is positive is approximately 40%. Two of the five countries in the sample (i.e., Czech Republic and Slovak Republic, in the year 2000) achieved this positive effect.[13]

The presence of non-linear growth effects within financial markets in the CEEC follows the findings of Coricelli et al. (2008), who use the IV and GMM approaches to show that, at an aggregate level, the effect of financial integration on economic growth in a sample of EU countries is non-linear and becomes positive and statistically significant only in the range between 60 and 160% of the value of financial development with respect to GDP. Also Rioja and Valev (2004a, 2004b), who analyze larger samples of countries at different levels of economic and financial development, find similar non-linear effects, with countries with an intermediately developed financial system benefitting the most. Similarly, in Table 3 columns 3-4, for a sample including EU-15 countries and the already mentioned five CEEC, using our *EFD-DE* industry-level indicator of financial dependence, we also provide evidence of the larger positive effects of financial development for its intermediate levels.[14]

Lower levels of private credit are usually correlated with a less developed institutional and regulatory environment, which might be a more relevant obstacle to economic growth in such a context. In other words, financial development is an important factor for future economic growth, but if the institutions and regulations are not sufficiently developed to guarantee a higher level of financial development, as well as an investment-friendly environment (i.e., an environment in which financed investments can potentially lead to higher returns), then the net effect of an increase in the financial development might lead to a misallocation of credit and not result in higher economic growth.

Graph 1. Marginal effects on industry growth of an increase in private credit to GDP ratio



In particular, to clearly convey the economic significance of our estimated coefficients,

[13] Even when we instrument the private credit to GDP ratio with institutional and regulatory variables (i.e., creditor rights protection and an indicator of foreign bank contestability, see Aghion et al., 2007), estimation results do not change.

[14] Note that, given the small size of our sample, punctual estimation might be biased. However, these results give us a clear idea of the presence of the non-linear effects of financial development on economic growth.

Graph 1 shows the marginal effects of financial development (proxied by the ratio of private credit to GDP) on the industry growth rates for two industries with different external financial dependence (*EFD-DE*), one with a higher level of financial dependence (at the 75th percentile of *EFD-DE* distribution), and the other with lower dependence (at the 25th percentile of *EFD-DE* distribution). Evidence confirms that i) industries more dependent on sources of external financing benefit more from improvement in the banking sector than less dependent industries; and ii) the real effects (positive or negative) of financial development are most likely to be captured by more financially dependent industries.[15]

4. Robustness check: analysis of firm-level data

As a further robustness check, we test our indicator for external financial dependence *EFD-DE* with a different sample and a different dependent variable. In particular, our dependent variable comes from the firm-level EBRD "Business Environment and Enterprise Performance Survey" for eight CEEC (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia for 2002, 2005, and 2007-2009), and corresponds to the entrepreneur's answer to the following question: "Is access to finance, which includes availability and cost, interest rates, fees and collateral requirements: No obstacle (0), Minor obstacle (1), Moderate obstacle (2), Major obstacle (3) and, Very severe obstacle (4)?". In other words, this variable indicates the perception of barriers to access to finance as an obstacle to the performance of the firm. Almost half the sample did not consider access to finance as an obstacle (0-1), while a quarter considered it an important obstacle (3-4). Among the countries analyzed, access to finance is not perceived in Estonia as an important financial obstacle, whereas in Poland access to finance is considered an important obstacle.

In addition to country-, industry-, year-, and firm size-fixed effects, the right hand side of our equation includes the ratio of private credit to GDP (*Credit_GDP*) interacting with our industry variable for external financial dependence *EDF-DE* (computed using Germany).

Table 4. Ordered logit estimation: Entrepreneur's perception of finance as an obstacle (EBRD survey)

	8 CEEC	
	(1)	(2)
(Credit/GDP) * EFD-DE	3.46980***	9.82580***
	(1.063)	(3.292)
(Credit/GDP)^2 * EFD-DE		-3.85759**
		(1.899)
Country FE	YES	YES
Industry FE	YES	YES
Firm size FE	YES	YES
Obs.	1885	1885
Pseudo-R^2	0.04	0.04

The dependent variable is the entrepreneur's perception of finance as an obstacle to growth: higher values of the variable indicate that finance is an important obstacle (EBRD firm level survey data).
Standard errors in parenthesis. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

[15] We also provide estimations on the same CEEC sample using Klapper et al.'s (2006) external financial dependence measure, which is computed using US quoted firms during the 1990s, in accordance with RZ's original approach. The estimation results show that the use of this indicator does not lead to significant estimation results. Estimation results are available upon request.

The estimations in Table 4, columns 1 and 2, use an ordered logit regression and, after controlling for industry, country, and firm size fixed effects, show that the ratio of private credit to GDP interacting with our indicator of external financial dependence has a statistically significant and non-linear effect on the perception of access to finance as an obstacle to firm performance.[16] In particular, an increase of private credit to GDP ratio for its lower levels is associated with the perception that access to finance is an important obstacle, while for its higher levels the increase is associated with the perception that access to finance is not as important an obstacle to firm performance. This result is consistent with the result presented above regarding value-added growth rates: improvements in the depth of the banking system lower financial obstacles only when the banking system itself is not underdeveloped, otherwise a higher availability of credit may not be sufficient to reduce the barriers to access to finance.

5. Conclusion

This study investigates the differential growth effects of financial development across industries, ranking the industries according to a new survey-based indicator of external financial dependence. We discuss the differences and potential advantages of a survey-based indicator and, using a widely used model specification à la Rajan-Zingales (1998), we test our indicator in the estimation of the finance-growth nexus for a small sample of Central and Eastern European Countries. Our estimation results show that an increase in banking sector size has non-linear effects on economic growth, with positive effects only at its higher levels.

[16] Theory and evidence show that financial development has a larger effect on more constrained firms, typically the smaller ones (see, for example, Aghion et al. 2007 and Beck at al., 2008). Thus, we control for firm's size fixed effects.

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