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Democracy, financial development, and economic growth: an empirical analysis

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1. Introduction

The aim of this paper is to empirically explore if there is any causality from democracy to economic growth with financial intermediation as the mechanism of that causality. The hypothesis is that increase in democracy boost development of financial intermediation and then such improved financial intermediation supports economic growth.

On the one hand, the relations between democracy and financial intermediation have not been in the focus of neither theoretical, nor empirical research, save a few recent contributions. On the other hand, relations between financial intermediation and economic growth have been well researched in the last few decades, the main mechanism of that relation has been explored and specified, with identification of the possible countervailing effect of financial development to the growth, especially on the higher levels of financial development, clearing the way for nonlinearities in this relation and ambiguous empirical findings on these nonlinearities. Nonetheless, there has been no research that deals with the causality that goes from democracy to financial intermediation and then from financial intermediation to economic growth. The rationale for this paper is to fill the gap.

The structure of the paper is as follows. First, in Section 2, relations between democracy and financial intermediation are examined, both theoretical explanation of the causality and empirical results, i.e. strength and statistical significance of the relation. Then, in Section 3, the main theoretical and empirical results of the research of relations between financial development and economic growth will be reviewed. Section 4 deals with data description an strategy of empirical research whose results are in the Section 5. Section 6 provides some results on the robustness tests, and Section 7 concludes.

2. Democracy and financial development

The causality from democracy to financial development have not been the topic of many theoretical and empirical contribution and most of them have been published in the recent years.

The mechanism of the causality starts with the impact of economic institutions to the financial development with insights that property rights protection, decreasing the risk of expropriation of private or public predators, contract enforcement and institutions that prevents political intervention in business operations have substantial role in the financial development (La Porta *et al.*, 1998, Pagano and Volpin, 2001, Rajan and Zingales, 2003, and Back *et al.*, 2003). On the other hand, it has been suggested (Clague *et al.* 1996) that democracies are better in providing those economic institutions that are beneficial for financial development. Some empirical support for this suggestion was provided by Begović *et al.* (2017). Hence, the impact of democracy to financial development is indirect via

economic institutions, those who decreases risks financial entrepreneurs face, predominantly risk of expropriation of both returns and investment itself.

Additional argument is about the impact of the incumbent firms of the real sectors. As Rajan and Zingales (2003) suggested, incumbent real sector firms may block or even reverse financial development, as it improves conditions for the new entries, increasing competition and threatening their rents. Accordingly, the political influence of business elite, the owners of the incumbent firms in the real sector is decisive for the outcome regarding the financial sector. As Acemoglu (2008) demonstrated, the crucial difference between democracies and autocracies, especially oligarchies, is the accountability. In autocracies, the government is accountable to the narrow group of business and political elite, protecting their private interest, and in democracies, government is accountable to the general public, protecting public interest, i.e. improving social welfare. In the first case the government's aim is to protect incumbent firms' rent, hence public policies will create obstacles for financial development. In the second case, there are string invectives for the government to design and enforce public policies that will boost financial development, since private interest of incumbent firms' is not shaping these policies.

Acemoglu (2008) argument about autocracies prone to creating and maintaining legal barrier to entry for protection of incumbents, i.e. business elite, does not apply only to the real sector. It is also incumbent banks, as the autocratic government protects the rents of the financial business elite. It is only politically connected investors in autocracies that can get funding for their investments projects and that creates additional barrier to entry, though not a legal one, creating additional rents for the real sector. Rents appropriated by the business elite, both those of the real and financial sector, are shared between business and political elite (Haber, 2008).

Democratic government faces different incentives and this eliminates legal barrier to entry in the financial/banking sector. This is the framework within which distinction between financial systems of the United States and Mexico can be explained (Haber, 2008). Not only that the Mexican one is less developed, but it is also much more bank-based. Barriers to entry to non-banking financial intermediation have been substantial to preserve

If two polar set-up of political institutions is modified, introducing "partial democracy" as possible set-up of political institutions, provides the ground for establish an U-shape, nonlinear relationship between political reform and financial liberalisation (Campos and Coricelli, 2009). The existence of such relation has been confirmed for the transitional economies, emphasising the possibility of revising the reforms of the financial sector. Under assumption that reforms of the financial sector, basically it liberalisation, boost it development, such a link can be established between political liberalisation and financial development.

Huang (2010) studies a panel of 90 non-transition economies over the period 1960-99, with the three indicators of financial development (liquid liabilities of financial intermediaries over

GDP, private sector credit over GDP and the ration of commercial banks assets over the sum of commercial bank and central banks assets), all of them biased towards the banking sector, i.e. mainly capturing the size of the bank-based financial intermediation. The regression analysis focused to the "before and after" event study in which the event was democratisation of the country. It was demonstrated that democratisation is beneficial for financial development, at least in the short run, and especially in low income countries.

Andrianova *et al.* (2011) described and case-by-case analysed the role of the governments in kick-starting financial development and financial markets in selected cities/countries (London, Amsterdam, and Hong Kong). Nonetheless, this contribution deals with political economy constellations in a few selected cases, rather than the impact of different political institutions to the financial development.

Yang (2011) used both cross-section and panel data for testing the relations between democracy and financial development. Though in some specifications statistically significant estimated of the relation has been recorded, this was only for bank-based financial intermediation and the result proved not to be robust to the introduction of the fixed effects in the case of panel date. No statistically significant relations between democracy and financial markets, i.e. market-based financial intermediation, were recorded.

Bhattacharyya (2013) in his research is focused to the effects of democratisation to the financial structure, rather than financial development as such. Democratisation is considered as the event of becoming democracy and it occurs that Polity IV index (which runs from -10 to +10) turn from negative to positive. Using the sample of 96 countries covering the period 1970-2005 it was demonstrated that democratisation creates grater probability for market-based financial structure.

Accordingly, there is a theoretical explanation of the causality from democracy to financial development and some empirical support of the hypothesis that democracy is beneficial for financial development. Furthermore, there is no theoretical ground to assume the existence of reversed causality from financial development to democracy. The theoretical framework for considering economic origins of autocracy and democracy (Acemoglu and Robinson, 2006) provides no ground for considering financial development as a factor of emerging either democracy or autocracy.

3. Financial development and economic growth

A consideration of the relations between financial intermediation and economic growth should be focused only long-run growth: only the impact of financial intermediation to the long-run rate of economic growth is consequential, not the short-term rate, i.e. volatility of output within business cycles. That means that only annual average growth rate in long-term periods is considered; short term volatilities within business cycle are not of the concern for

this contribution. In short, the object of the analysis is that very economic growth that moves some country from poverty into the prosperity.

It has been demonstrated (Levine, 2005) that financial intermediation is advantageous for economic growth due to the few mechanisms: (1) pooling of savings, both domestic and international, (2) producing information and allocating capital; (3) monitoring firms and excreting corporate governance; (4) risk amelioration; and (5) easing exchange and enhancing division of labour. Furthermore, it was empirically demonstrated (Beck *et al*., 2007) that financial intermediation decreases both absolute (number of people with consumption below 1 USD per day) and relative poverty (relative income of people of the bottom income quantile). All five mechanisms are consistent with the basic findings of the contemporary theory of economic growth and none of them is *per se* controversial. Financial intermediation is helpful both for the production factor accumulation and for increase in Total factor productivity (TFP). Although there are substantial number of contributions dedicated to the comparative analysis of the outcomes of the different types of financial intermediation (based on banking or non-banking financial intermediation), the debate, at least for the time being, did not produce an unambiguous insight.

Nonetheless, financial intermediation is a necessary but not sufficient condition for (accelerated) economic growth. Although there is no academic consensus regarding specific preconditions for economic growth (Easterly, 2001 and Helpman, 2004), especially not regarding their relative importance in a specific context, there is a consensus on the abstract level of the theory of economic growth what are the main sources of growth (Weil, 2009). Based on these insights of the economic growth theory, it can be inferred that there is a set of conditions that must be met in order of speedy and, especially, sustainable economic growth (Rodrik, 2010). Apparently, financial intermediation is only a necessary, but not a sufficient condition for economic growth.

On the analytical front, there is an issue of two-way causality relationship. There are clear theoretical arguments in favour of the insight that the causality goes from financial intermediation toward economic growth (Rajan and Zingales, 1998). Nonetheless, it is evident that speeding-up of economic growth produces increase of income per capita and that in turn increase domestic saving which influence the increase of the output of financial intermediation, i.e. level of development of financial sector. Of course, the more affluent society is, the wealthier are individuals that society is consisted of, the bugger is supply of saving, i.e. supply of financial capital, hence the bigger is demand for financial intermediation services, and the higher level of their development (Shiller, 2012). Furthermore, the more business endeavours that should materialize, the bigger demands for savings, hence increase of demand for financial intermediation from that side. It is exactly on this argument that Lucas (1998) founded his view that financial intermediation is not the key precondition of economic growth, but rather that it just followed the growth of the real sector, based on the decisions of the entrepreneurs to commence their business endeavours with its services.

Nonetheless, although the observed simultaneity is an issue in econometric research (endogeneity of explanatory variable), it is not *per se* a problem in theoretical consideration of this causality. Furthermore, as there is a positive loop, accelerated development of financial sector that can substantially speed-up economic growth, enables further acceleration of development of financial sector, especially at the middle level of income *per capita*, i.e. level of development of a country and financial intermediation in it – a virtuous circle is created. More information about the circle is provided by Granger causality test (Demetris and Hussein, 1996), demonstrating that the causality from financial intermediation is much stronger than the reverse one, and the relative strength of these tow causality directions changes with the level of development of a country and financial intermediation in it.

There is a theoretical controversy about whether, under some conditions, financial intermediation can have adverse effects to the economic growth. Can increase in the level of development of financial intermediation bring about slowing down economic growth or even negative growth rates? If such a possibility exists, then there is a question of the mechanism by which the increase in the level of development of financial intermediation slows down economic growth.

The first mechanism of this kind identified in the literature is linked to the financial instability, taking into account that there is inherently higher volatility of the output level of the financial sector compared with the real one. That instability is inherent to the financial sector due to its character, i.e. inherently lower level of information in the case of financial instruments comparing with the products of the real sector, as it will be more considered in the next section of the paper. Accordingly, the increase in the level of development of financial intermediation, that unavoidably increase the share of this industry in the total output, *ceteris paribus* increases the volatility of the economy and that volatility have adverse effects to the long-term economic growth (Kaminsky and Reinhart, 1999). That means that there are two countervailing effects. It is reasonable to assume that on the lower level of development of financial intermediation dominates the effect in which, by already described mechanisms, spurs economic growth, while on the higher level of development of financial intermediation, i.e. with high share of financial sector in total output, the other effect dominates.

Yet the observed instabilities of financial sector trigger amplification of short-term volatility of the total output, increase of frequency and variability of the short-term growth rate, but their impact on the long-run, on the rate of potential economic growth is limited. Accordingly, after crossing some threshold of the relative size of financial (in reference to the real one), further development and advance of the financial sector can adversely influence the volatility of the short-term economic growth, but not the long-run rate of economic growth (Loayaza and Ranciere, 2006).

The relative size of the real and financial sector is the ground for the second mechanism that can lead to the decreasing returns of development of financial intermediation to economic growth. This is the point: if financial sector growths faster than the real one, then a

reallocation of production factors happens, predominantly labor, from the real sector to the financial one. Such a reallocation, as the real sector faces the deficit of the supply of the labor, especially the one with the highest level of human capital, generates slowing down of the economic growth due to the smaller utilization of the production factors in the real sector (Bolton *et al.*, 2011). Nonetheless, this finding is not unconditionally true.

There are two necessary conditions for that. The first one is that total factor productivity in the real sector is higher than the financial one. If the growth rate of the GDP *per capita* is considered, then key issue is a relative labour productivity in these two sectors. The second one is that the law on diminishing returns in the real sector operates less intensive than in the financial one. Without simultaneous fulfilment of the both conditions, the insight about adverse effects of financial development on the economic growth is not true. It is quite clear that reallocation of the resources from the sector with lower to the sector with higher total factor productivity is not relevant for slowing down economic growth. On the contrary, such a reallocation generates speeding-up economic growth, though the transitory one, i.e. a one-off increase of the level of GDP only during the reallocation and its one-off effects. Accordingly, if it is not demonstrated that the financial sector features total factor productivity lower that the real one, both before and after the reallocation, the identified mechanism of slowing down economic growth with the increase in the level of development of financial intermediation cannot be accepted as the relevant one. The probability for those two necessary conditions to be fulfilled increases with the increase in the share of financial sector in the total BDP, i.e. with the increase in the level of development of financial intermediation.

It is reasonable to assume that only on very high levels of development of financial sector more intensive decreasing returns of the financial sector compared to the real one can be recorded. Of course, whether such a level of development of financial intermediation exists and what is exactly the level on which further of that level generate ceteris paribus decrease in the rate of economic growth is an empirical question, i.e. the question in which answer can be provided only by empirical research. Furthermore, as demonstrated by Ductor and Grechyna (2015), the matter is not so much about the level of development of financial intermediation, but about the relative size of financial sector compared with the real one. The point is that there is an implicit assumption the increase in the level of development of the county, i.e. the level of development of financial intermediation, generates the increase of the size of financial sector compared with the real one – the share of financial sector in the total GDP increases.

Perhaps the mechanism of automatic adjustment could operate in those circumstances. The decrease in the relative total factor productivity means the decrease of the marginal returns generates the decrease of the relative returns of the investment in the financial sector – the relative risk adjusted profit rate falls – and that means that incentives to investors for investing into the real sector becomes stringer. In other words, if the describer situation of

the fall of relative total factor productivity occurs, it can be expected that this will generate the decrease in its relative size.

Identification of these two mechanisms that explain possible diminishing and even negative marginal returns of financial intermediation to economic growth clears the way for the nonlinear causality relationship between financial intermediation and economic growth. Empirical research (Rioja and Valev, 2004, Manganelli and Popov, 2013, Cecchetti and Kharroubi, 2015, Ductor and Grachyna, 2015, and Gould *et al.*, 2016) demonstrated that there was an empirical ground for the insight that this relationship features an inverted U curve, meaning that the strongest beneficial impact of the financial intermediation to economic growth exists on the middle level of its development. Somewhat weaker results of such an advance of the financial intermediation in the case of countries with high level of development of financial sector, meaning that there might be diminishing and after some threshold even negative returns of the financial intermediation to economic growth. For example, the results of a recent empirical research (Arcand *et al.*, 2015) demonstrate that negative returns of the financial intermediation to economic growth begin at the level of 100% ratio between the credits to private sector and GDP – further development of financial sector, further increase of "financial depth" generates decrease of the rate of economic growth.

4. Strategy of empirical research and data description

4.1. Data description

We used panel data for 214 countries, for the period from 1960 to 2013. Data on GDP per capita (variable GDP p.c. was taken from the World Bank World Development Indicators (WDI indicator NY.GDP.PCAP.KD) was used to construct the growth rate as the main dependent valuable, as well as control for convergence. The level of human capital (variable LSEC) was measured by the ratio of gross enrolment ratio to secondary schools for both sexes (WDI indicator SE.SEC.ENRR).

Three measures of democracy were used. The first measure used was Polity IV (Marshall *et al.*, 2006), with the democracy score ranging from -10 (least democratic) to 10 (most democratic). Secondly, we used the Freedom House democracy index (FH), classifying countries as free (1), partially free (2) and non-free (3), with the democracy score ranging from 7 (least democratic) to 1 (most democratic). The third democracy index (variable ANRR) is a democracy index constructed by Acemoglu *et al.* (2014), which provides us with a consolidated democracy index that originally uses both Polity IV and FH measures of democracy but then aims at refining the shortcomings of the previous indices by consolidating them with several secondary sources (Cheibub, Gandhi, and Vreeland (2010), Boix, Miller, and Rosato (2012), and Papaioannou and Siourounis's (2008)). The second and third measures

were used only for testing the robustness of econometric results of the regressions models using Polity IV.

The duration of democracy is measured for each of the three indices (Polity IV, FH and ANRR), again with the Polity IV-based indicator of duration being the main one, and the other two used for robustness of the results, by using the WDI-based sample (1960-2013) and correcting the first year of democracy by applying Boix, Miller and Rosato (2012) to align the results with actual data on the emergence of democracy.

Following Levine (2005), three indicators of financial development have been used in the econometric analysis.

PRIV (WDI FD.AST.PRVT.GD.ZS) equals credits to private firms by banking sector divided by GDP. The rationale of this indicator is intuitive. The financial system that allocates more credits to private firms is more engaged in all the activities of financial intermediation.

BANK (GFDD.DI.04) equals the ratio of bank assets divided by the bank credits plus central bank domestic assets. The rationale of this indicator is that financial development decreases the role of the central bank in financial intermediation.

DEPTH (WDI FS.LBL.LIQU.GD.ZS) equals liquid liabilities of the financial system (both banks and nonbanks financial intermediaries), i.e. M3 divided by the GDP. It is intuitive that increase of the relative amount of the liquid liabilities of financial institutions to GDP indicates higher level of financial development. This indicator deal both with banking and non-banking financial intermediation.

The first and third measures were used only for testing the robustness of econometric results of the regressions models using BANK.

Openness (WDI FD.AST.PRVT.GD.ZS) of the economy is measured as total trade as percentage of the GDP.

4.2.   General econometric strategy

We start with modelling financial development variable within the following baseline specification:

$$F_{i,t} = \alpha_0 + \alpha_1 F_{i,t-5} + \alpha_2 Dem_{i,t-5} + \beta_1 GDP_{i,t-5} + \beta_2 OPEN_{i,t-5} + CD_i + TD_t + \xi_{i,t} \quad (1)$$

F is the measure of financial development in country *i* at time *t* (log value*), GDP* is the log value of GDP per capita in country *i* at time *t, Dem* is a level of democracy in country *i* at time *t*. CD and TD denote vectors of country and time dummies respectively. The stochastic error term is given as $\varepsilon_{i,t}$. *F* lagged for five years is included as an explanatory variable. The reason for that is that financial development is path depended and that virous circle can be

established. Accordingly, a positive sign of parameter of the lagged F as explanatory variable should be expected. GDP is included as an explanatory variable for two reasons. First because there is a correlation between financial development and GDP level, with higher GDP creating more demand for financial sector and increasing level of it development. Also, since there is some correlation between democracy and GDP with multiple channels of causality, the GDP effect to financial development should be controlled for. Accordingly, a positive sign of parameter of the lagged GDP as explanatory variable should be expected. Additional economic explanatory variable is introduced, representing the log value of the level of economy openness in country i at time t ($OPEN_{i,t-5}$). The theoretical rationale is that increasing openness of the economy creates more demand for financial services and fosters development of the financial sector. Accordingly, a positive sign of parameter of the lagged OPEN as explanatory variable should be expected.

Equation (1) is estimated in several versions that are described below:

a) Duration of democracy is used instead of democracy index at lag five ($Dur_{i,t-5}$).

b) An interactive explanatory variable was included defined as the product of democracy duration and democracy indicator at lag five ($Dur_{i,t-5}Dem_{i,t-5}$). This variable is kept either alone as a democracy measure or with both democracy duration and democracy index variables.

The rationale for using duration of democracy instead of its level is that effects of democracy to economic institutions, relevant for financial development and very long-term, hence the years of uninterrupted democracy could be relevant. Adjunct to this rationale is interactive term of level and duration of democracy, as it can be assumed that after a number of years in democracy, i.e. in mature democracies, exact level of democracy is not so important as I n the case of fresh democracies.

All regressions of form (1) contain lagged depended variable as explanatory one. This is the reason estimations are performed by the GMM method based on the Arellano-Bond approach. Otherwise, the panel OLS method would yield imprecise results. Standard errors for the parameters are again obtained by using cross-section weights to take care of cross-section dependence in the data.

We then proceed linear regression model of economic growth of the following form:

$$Y_{i,t} = \beta_0 + \beta_1 F_{i,t-5} + \beta_2 GDP_{i,t-5} + \beta_3 SEC_{i,t-5} + CD_i + TD_t + \varepsilon_{i,t} \qquad (2)$$

The set of explanatory variables is defined as follows: *F* is the measure of financial development in country *i* at time *t* (log value*)*, GDP is the log value of GDP per capita in country

i at time *t, SEC* is a level of human capital in country *i* at time *t* approximated by secondary educational attainment (log value). CD and TD denote vectors of country and time dummies respectively. The stochastic error term is given as $\varepsilon_{i,t}$. Dependent variable $Y_{i,t}$ is defined as: $Y_{i,t} = 100 \left(GDP_{i,t} - GDP_{i,t-5} \right)/5$, thus representing the annual average five-year GDP per capita growth rate. Explanatory variables enter the equation with a lag of five periods. Such a lag enables results to be more robust to short-run variations in the data. Additionally, the absence of contemporaneous explanatory variables, i.e. five years of lag of explanatory variables, reduces the issue of endogeneity, removing the need for introducing instrumental variable.

Further empirical analyses were performed on the following modification of equation (2):

a) Squared value of financial development indicator *F* is included as additional explanatory variable at lag five ($F^2_{i,t-5}$). This enables nonlinearities to be tested. If the parameters of the squared value is negative, that would be an evidence on the existence of inverted U relationship between financial development and economic growth.

b) An interactive explanatory variable is added, representing the product of financial development and the GDP level, both at lag five ($F_{i,t-5}GDP_{i,t-5}$). If the parameter of the parameter is negative, that would be an evidence of decreasing beneficial impact of the financial intermediation to economic growth with higher income level.

c) Democracy indicator measured by Polity 4 is added at lag five as new explanatory variable ($Dem_{i,t-5}$), to test whether the introduction of this variable decreases the significant of the estimations of the parameters of other variables.

d) The two-stage procedure estimation was conducted as follows. In the first step financial development indicator ($F_{i,t}$) was estimated as a function of democracy index, lagged five periods. Within the second step, the baseline regression (1) was estimated with the financial development indicator replaced by its approximated value from the first step. Residuals from the first step are also included as new explanatory variable.

All regressions based on (2) are estimated as the panel two-way fixed effects model. The results of the Hausman test support its application against the panel random effects model. Standard errors for the parameters are calculated by using cross-section weights to take care of cross-section dependence in the data.

Prior to modelling, quantitative variables are checked for stationarity. Results of unit-root testing for the following variables: $Y_{i,t}, GDP_{i,t}$ and $SEC_{i,t}$ are reported in Begović et al. (2017). Therefore, only the rest of the variables are considered here. The first generations test defined by Levin *et al.* (2002, LLC), Im *et al.* (2003, IPS) and Maddala and Wu (1999, Fisher type ADF) were employed.

Table 1.

Panel unit-root tests

Variable	Deterministic terms	LLC	IPS	Fisher ADF
BANK	Constant	-27.74***	-15.30***	843.24***
	Constant and trend	-41.35***	-13.71***	699.75***
OPEN	Constant	-5.34***	-6.05***	734.91***
	Constant and trend	-8.83***	-10.29**	835.14***

Note: *** and ** denote a significance of 1% and 5% respectively. The number of lag lengths is chosen according to the SC criterion, starting with the maximum value 3.

5. Results of empirical research

The main results of the estimation of model (1) are in the Table2.

Table 2.

Dependent variable: Financial indicator (BANK), 1966-2013

Variable	(1)	(2)	(3)	(4)	(5)
Bank (-5)	0.333***	0.420***	0.464***	0.456***	0.483***
	(0.098)	(0.078)	(0.078)	(0.078)	(0.080)
Polity IV (-5)	0.009***		0.009***	0.011***	
	(0.003)		(0.003)	(0.003)	
Duration (-5)		-0.004**	0.024***		0.029***
		(0.002)	(0.008)		(0.007)
Polity IV (-5)* Duration(-5)			-0.003***	-0.0005**	-0.004***
			(0.001)	(0.0002)	(0.001)
GDP per capita (-5)	-0.037	0.012	-0.038	-0.057	-0.047
	(0.074)	(0.069)	(0.078)	(0.077)	(0.078)
Open (-5)	0.143**	0.120**	0.162***	0.177***	0.163***
	(0.061)	(0.050)	(0.058)	(0.056)	(0.059)
Countries (observations)	139 (4140)	159 (4807)	139 (4140)	139 (4140)	139 (4140)
J-stat p-value	420.37 0.95	477.19 0.98	609.54 0.99	689.18 0.89	601.18 0.98

* Significant at p ≤ 10%

** Significant at p ≤ 5%

*** Significant at p ≤ 1%

All the estimates of the parameters of level of democracy are positive and statistically significant with rather straightforward conclusion. The parameters of democracy duration are

all statistically significant, but in one case (in the specification when it is the only institutional explanatory variable) it is negative, which is counterintuitive. The explanation for this result comes from the estimation of interactive term, all of them statistically significant and negative, meaning that with increase of the duration of democracy the impact of the level of democracy to financial development is decreasing. This supports view that duration of democracy is more important for financial development than the level of democracy.

GDP level per capita proved not to be statistically significant implying that it is institutional variables that are crucial for financial development, and openness of economic proved to be statistically significant with a theoretically expected sign.

Table 3.
Dependent variable: annual average five-year growth rate, 1975-2013

Variable	(1)	(2)	(3)	(4)
Constant	39.664***	25.585***	46.627***	40.867***
	(3.121)	(4.931)	(2.543)	(3.127)
Financial development: Bank (-5)	5.409***	6.107***	0.921***	4.214***
	(1.358)	(1.054)	(0.243)	(1.256)
Financial development Bank $(-5)^2$	-0.598***			-0.451***
	(0.185)			(0.174)
Financial development Bank (-5)* GDP per capita (-5)		-0.757***		
		(0.158)		
Polity IV (-5)			0.016	0.014
			(0.012)	(0.012)
GDP per capita (-5)	-6.142***	-2.847***	-5.992***	-5.964***
	(0.295)	(0.747)	(0.331)	(0.330)
Secondary education (-5)	-0.191	-0.229	-0.284	-0.331
	(0.181)	(0.183)	(0.191)	(0.190)
Countries (observations)	155	155	135	135
	(3481)	(3481)	(3057)	(3057)
R-squared	0.545	0.547	0.554	0.556
Adj. R-squared	0.519	0.520	0.527	0.528

* Significant at p ≤ 10%

** Significant at p ≤ 5%

*** Significant at p ≤ 1%

All the estimations of the parameters of the financial development indicator are statistically significant with theoretically expected signs. Positive sign in the case of F (financial development) and negative sign in the case of squared F (financial development) demonstrates the existence of the nonlinearities in the relations between financial development and economic growth of the inverted U type. Introduction of the level of democracy in to the regression model do not change the significant of the parameters of financial development variables and the parameters of level of democracy variable are not statistically significant, implying that democracy effect to economic growth "works" through financial development. Interactive term of financial development and economic development parameter is statistically significant and negative, implying that the relevance of financial intermediation for economic growth decreases with the increased level of economic development, i.e. with income *per capita*.

Table 4.
Two-stage procedure
Dependent variable: annual average five-year growth rate, 1975-2013

Variable	(1)	(2)
Constant	1.291	-138.856
	(8.916)	(24.968)
BANK(-5)-RESIDUAL(-5)	10.878***	77.872***
	(1.933)	(11.221)
RESIDUAL(-5)	0.678***	-0.054
	(0.246)	(0.308)
(BANK(-5)-RESIDUAL(-5))^2		-8.027***
		(1.306)
RESIDUAL(-5)^2		-0.502
		(0.579)
GDP per capita (-5)	-5.757***	-5.666***
	(0.322)	(0.325)
Secondary education (-5)	-0.242	-0.374
	(0.189)	(0.190
Countries (observations)	135	135
	(2981)	(2981)
R-squared	0.580	0.587
Adj. R-squared	0.554	0.560

* Significant at p ≤ 10%
** Significant at p ≤ 5%
*** Significant at p ≤ 1%

Two stage procedure provided somewhat conflicting results. If it is assumed that there is a liner relationship between financial development and economic growth, it is both financial development influenced by democracy and financial development influenced by residual factors that are statistically significant. If it is assumed that there is a nonlinear relationship between financial development and economic growth, it is only financial development influenced by democracy that is statistically significant. In any case, financial development influenced by democracy that is always statistically significant.

6. Robustness tests

The main robustness tests have been based on using alternative indicators of financial development and democracy. Most of the results obtained by using Freedom House index of level democracy and composite index used by Acemoglu et al. (2014) proved to be robust to the change of these indicators. Furthermore, use of the alternative indicators of financial development also provided evidence of robustness of the obtained results.

In the case of nonstationary, hence first differences of both dependent and explanatory variables have been used. The obtained results are consistent with the basic results of the regression model estimated described in the previous chapter.

7. Conclusion

Empirical results obtained in the paper demonstrated that there is some empirical evidence to support the hypothesis is that increase in democracy boost development of financial intermediation and then such improved financial intermediation supports economic growth. The estimation of the model with financial development as dependent variable demonstrated that there is a statistically significant relation from level of democracy to the financial development. Democracy duration proved to be relevant and in the cases of increased duration of uninterrupted democracy actual level of democracy impact is decreasing. Income *per capita* proved not to have statistically significant relation to financial development.

The impact of financial development to economic growth proved to be statistically significant and nonlinear, with decreasing and negative returns after a threshold of financial level of financial development. The estimation of the interactive term demonstrated that with the increase of income *per capita* decrease the strength of the positive impact of financial intermediation to economic growth. Including level of democracy in the regression model as explanatory variable did not make the estimations of parameters of financial development insignificant, and the parameters of democracy level were not significant themselves, inferring that the impact of democracy to the economic growth "works" thought financial development.

Two stage model in which the in the second stage the explanatory variable is the estimate of the financial development induced by the democracy results provided statistically significant parameters of the financial development, confirming that financial development is a channel thought democracy "works" to boost economic development.

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