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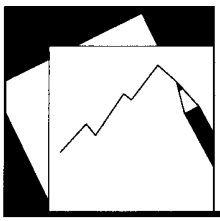

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Development of Financial Markets in Central Europe: the Case of the CE4 Countries

Amat Adarov and Robert Tchaidze

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Development of Financial Markets in Central Europe: the Case of the CE4 Countries

Prepared by Amat Adarov and Robert Tchaidze[1]

Authorized for distribution by Zuzana Murgasova

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Abstract

Financial markets in the CE4 countries are still shallow compared to other advanced EU countries. While the government bond markets are comparable in size, measured by capitalization in percent of GDP, the private bond, private credit, and equity markets lag behind. Empirical analysis in this paper helps identify factors that explain this phenomenon. We find that the observed differences cannot be explained by macroeconomic variables only, but incorporating indicators of institutional development and external funding eliminates the gap in the case of the equity and private credit markets. However, for the private bond market a significant gap remains even after accounting for these factors.

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Authors' E-Mail Addresses: aadarov@walton.uark.edu, rtchaidze@imf.org

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I. INTRODUCTION

It is widely recognized that financial development is one of the critical driving forces of economic development[2] and significant efforts have been devoted to explaining existing differences across countries. Despite sizeable literature, empirical evidence is still rather mixed and consensus has not been reached with respect to specific factors that facilitate financial development or with respect to optimal policy prescriptions that would stimulate it.

In this paper we focus on financial markets in the CE4 nations (the Czech Republic, Hungary, Poland, and the Slovak Republic), which represent a rather appealing case to investigate for several reasons. These are the countries that not so long ago have been transition economies, and thus, share many common features in their institutional background and policy experiences with other emerging markets. In particular, that is the case with respect to their financial systems where financial intermediation is dominated by the banking sector, while security markets are relatively less important. However, on the other hand, the CE4 countries are already sound market economies, belonging to the high or the upper-middle-income group,[3] which suggests maturity of decision-making processes both in the private and public sectors.

Despite considerable efforts undertaken to facilitate financial development, it is frequently argued that financial systems in the CE4 countries are underdeveloped, possibly due to weak governance and other institutional impediments. Indeed, as can be seen from Figure 1, while public bond markets in the CE4 nations are comparable to those of the other advanced economies, the private financial segments—the private credit market, the private bond market, and the stock market—are considerably smaller in size.[4] However, the small size of the financial markets itself is not necessarily an indication of their underdevelopment in the sense that they fail to meet the financing needs of resident borrowers. A more careful investigation requires benchmarking financial development of the CE4 nations against performance of comparable economies controlling for the stage of economic development and other relevant macroeconomic fundamentals.

In order to do that, we resort to panel data analysis of high-income and upper-middle-income economies establishing benchmark relationships between macroeconomic fundamentals and financial development indicators. Then we compare de-facto financial performance of the CE4

[2] Empirical evidence is well documented in the literature, e.g., Greenwood and Jovanovic (1990), Bencivenga and Smith (1991), Demetriades and Hussein (1996), Levine and Zervos (1998), Singh (1997), Levine (2003), Goodhart (2004).

[3] In particular, according to the IMF classification both the Czech Republic and the Slovak Republic have been advanced economies since 2008.

[4] In fact, in the case of Poland and the Slovak Republic, the private bond market data are not even available from the database that we use.

countries with the expected levels given their macroeconomic conditions. We also analyze to what extent underperformance, if any is found, can be explained by inadequate institutional development, as is often argued.

Overall, our paper contributes to the literature along the following dimensions. First, our analysis is based on the most recent data available, providing an up-to-date perspective on financial market development in the CE4 countries. Second, while most of the literature focuses on private credit and stock markets, we also assess performance of private bond markets. Third, we use several alternative techniques for robustness and address econometric issues often neglected in the literature. Finally, we benchmark performance of each of the financial segments against the same set of macroeconomic fundamentals for a broad sample of countries, which ensures that impacts of particular factors are evaluated on the same comparable basis for all of these financial segments.

We find that in the CE4 economies all of the three financial segments examined are significantly below the expected levels given the countries' macroeconomic fundamentals. While the macroeconomic variables by themselves cannot explain the observed differences, incorporating indicators of institutional development and external funding eliminates the gap in the case of the stock and the private credit markets. In the case of the private bond market, however, a significant gap remains even when accounting for these factors.

The rest of the paper is structured as follows: Section II provides a brief overview of the existing literature, Section III describes data and empirical framework, Section IV discusses estimation results and additional analysis performed for robustness, while Section V concludes.

II. Literature on Determinants of Financial Development

The existing literature outlines a range of factors affecting development of financial markets that can be split into two categories: "macroeconomic fundamentals" that reflect broad macroeconomic characteristics (economic development measures, inflation, exposure to global trade and capital flows, etc.); and "institutional factors" that reflect the state of regulatory and supervisory institutions (legal framework, extent of corruption, protection of the property rights, political stability, etc.). Both of these categories seem to matter. Moreover, they are interrelated as the evolution of institutional parameters is directly reflected in macroeconomic conditions, and favorable macroeconomic environment facilitates development of institutions. Therefore, such a division of the literature is purely provisional and does not imply alternative views on the determinants of financial development.

Under the "macroeconomic" approach, favorable macroeconomic conditions are emphasized as essential for healthy financial systems. Strong association has been well documented between development of financial markets and macroeconomic parameters such as income levels, savings, economic openness, inflation, and macroeconomic volatility.

Many studies find that the overall level of economic development, often measured by per capita income or income growth measures, is the strongest predictor of financial progress. The significance of per capita income for financial development is reported, for example, in Levine (1997, 2003) and Claessens et al. (2006). Garcia and Liu (1999) find that income growth, domestic investment, and financial intermediary development have significant implications for stock markets, while macroeconomic volatility does not seem to matter. Focusing specifically on the development of emerging capital markets, El-Wassal (2005) finds that economic growth, financial liberalization policies, and foreign portfolio investments are important for financial development.

A large pool of literature investigates the impact of inflation on capital markets. High levels of inflation, ceteris paribus, are associated with less liquid and smaller financial markets as financial intermediaries tend to lend less and allocate capital less efficiently. Among the recent works, Boyd et al. (2001) find negative effects of inflation on the private credit and equity markets. They also argue that the relationship between financial development and inflation could be nonlinear with a particular threshold level after which financial sectors experience an abrupt drop in performance. Similar inflation effects are also investigated empirically in Khan et al. (2001) and theoretically in Choi et al. (1996) and Huybens and Smith (1999).

Economic openness is also frequently argued to be relevant for domestic capital market development, but the distinction is often drawn between capital and trade openness. For example, the importance of trade openness for financial development is emphasized in Svaleryd and Vlachos (2002), Do and Levchenko (2007), whereas Chinn and Ito (2006) discuss the

significance of capital openness.[5] Rajan and Zingales (2003) move the discussion of economic openness effects to the political economy dimension and argue that domestic interest groups oppose financial development to avoid higher competition, and that both trade and capital openness are necessary to reduce their opposition to financial development. However, Baltagi et al. (2009) find only limited support for this hypothesis and, while confirming the importance of trade and capital openness for financial development, suggest that those do not necessarily have to be simultaneous in order to trigger growth of capital markets.

A range of other macroeconomic factors are used to explain capital market differences, including macroeconomic volatility, which decreases incentives to engage in financial contracting, and related policy variables, e.g. public debt burden, fiscal deficits, and tax burden on businesses. However, specifications are often ad-hoc, while results rather inconclusive.

The "institutional" strand of literature emphasizes the role of property rights, contract enforcement, and corruption in explaining cross-country variation in financial development.[6] La Porta et al. (1997, 2000), for example, demonstrate a deep impact of investor protection rights, measured by the quality of legal rules and law enforcement, on the development of both debt and equity markets. Contracting rights institutions are found to be a significant contributing factor in Djankov et al. (2007), property rights institutions are discussed in Acemoglu and Johnson (2005), and Roe and Siegel (2009) emphasize the importance of overall political stability for financial development.

Overall, while the literature looks at a variety of macroeconomic and institutional factors, no consistent view on the determinants of financial development that summarizes the model in a single framework has been developed. The range of factors important for financial systems could be roughly aggregated to the overall level of economic development, social and economic stability, political and legal framework, economic openness, whereas the marginal effect of each of these categories is difficult to isolate as they are interrelated and the causality between them and the level of financial development is a complex phenomena characterized by feedback effects and lags.

[5] Specifically, they argue that financial openness has beneficial effects for domestic capital markets only when institutions are sufficiently developed.

[6] Legal theories of financial development are discussed extensively, for instance, in Beck et al. (2003a, 2003b).

III. DATA AND METHODOLOGY

We evaluate financial sector performance in the CE4 nations relative to countries comparable in terms of their economic development. Since according to the World Bank income group classification, the Czech Republic, Hungary, and the Slovak Republic are high-income economies and Poland is an upper-middle-income economy, our analysis is based on a panel dataset comprising 68 upper-middle-income and high-income countries worldwide (Table 1) and spanning the period of 1994–2008 at annual frequency.

It is important to compare financial development both across time and across countries. Focusing only on a cross-section for an individual year could result in incorrect judgment of relative performance for some countries as they could be affected by short-term idiosyncratic downturns of financial development due to business cycle effects or policy changes. Comparing across countries is important as it allows assessing performance relative to peer economies with similar macroeconomic structural characteristics and similar level of overall economic development. The global scope of the sample and the time span help reduce the risk that results are heavily influenced by either region-specific characteristics or macroeconomic circumstances of particular years. At the same time, focusing on relatively well-established market economies makes analysis less prone to problems stemming from incomplete or low-quality data.

Financial development variables characterizing the size of the private credit sector, stock and private bond markets are obtained from the Database on Financial Development and Structure[7] introduced in Beck and Demirgüç-Kunt (2009). The earlier version of the dataset, introduced in Beck et al. (2000), has been extensively used in the empirical research assessing financial markets in a panel data setting.

Macroeconomic data are obtained from the World Economic Outlook and International Financial Statistics databases of the IMF, the World Development Indicators of the World Bank, and the UNCTAD Foreign Direct Investment Database, associated with the World Investment Report.

In our measurements of institutional development we use the Worldwide Governance Indicators (WGI) produced by the World Bank (Figure 2). We use the indices of government effectiveness, regulatory quality, rule of law, and control of corruption to measure different aspects of institutional environment. Each of the indices is measured in units ranging from approximately -2.5 to 2.5, with higher values corresponding to better governance outcomes. We believe these indices to be superior to alternative measures of institutional development as they

[7] April 2010 revision.

are constructed from raw metrics from a wide range of sources[8] and are continuous, rather than cross-country rankings or low-range discrete index values, hampering regression results.

In our empirical analysis we use the following variables (summary statistics in Table 2; cross-correlations in Table 3):

- *Financial development* is one of the three measures of financial sector development for a country in a given year:
    - *Private credit/GDP*—claims on the domestic private sector by deposit money banks as a share of GDP;
    - *Private bond market capitalization/GDP*—the total value of outstanding domestic debt securities[9] issued by financial institutions and corporations as a share of GDP;
    - *Stock market capitalization/GDP*—the total market value of stocks listed on domestic stock exchanges as a share of GDP.
- Among the explanatory variables we use:
    - *Log of real GDP per capita*—natural logarithm of real GDP per capita in PPP terms;
    - *Trade openness*—the sum of exports and imports of goods and services as a share of GDP;
    - *Inflation*—annual inflation rate (GDP deflator);
    - *Inflation volatility*—the change in the rate of inflation between the current and previous years, averaged over the corresponding 3-year periods for estimations involving 3-year non-overlapping averages; the standard deviation of annual inflation over the 10-year period for estimations involving 10-year averages data; and the change in the rate of inflation between the current and previous years for specifications based on annual frequency data;
    - *Public bond market capitalization/GDP*—the total value of public domestic debt securities issued by the government as a share of GDP;

[8] The sources include surveys of firms and individuals, assessments of commercial risk rating agencies, non-governmental and multilateral aid agencies. For methodology, see Kaufmann et al. (2009).

[9] Domestic debt securities constitute issues by residents in domestic currency targeted at resident investors.

- *Government effectiveness*—an index, measuring the quality of public services, the capacity of the civil service and its independence from political pressures, and the quality of policy formulation;
- *Regulatory quality*—an index, measuring the ability of the government to provide sound policies and regulations that enable and promote private sector development;
- *Rule of law*—an index, measuring the extent to which agents have confidence in and abide by the rules of society, including the quality of contract enforcement and property rights, the police, and the courts, as well as the likelihood of crime and violence;
- *Control of corruption*—an index, measuring the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests;
- *CE4*—the dummy variable that takes the value of unity for the CE4 nations and zero otherwise.

As we attempt to benchmark financial performance against relevant macroeconomic indicators, rather than explain cause-effect relationships of particular factors, we examine the relationship between the fundamentals and financial development indicators in order to establish the financial development "norms"—expected values of financial development indicators, contingent upon the assumption that levels of financial development can be consistently related to the overall economic development levels, controlling for other relevant macroeconomic parameters.[10] The general form of our baseline model is:

Financial development =	β_1 *log of real GDP per capita* +	macroeconomic fundamentals
	β_2 *inflation rate* +	
	β_3 *inflation volatility* +	
	β_4 *trade openness* +	
	δ *public bond market capitalization / GDP* +	
	μ_1 *control of corruption* +	institutional development variables
	μ_2 *government effectiveness* +	
	μ_3 *rule of law* +	
	μ_4 *regulatory quality* +	
	γ CE4 +	CE4 dummy
	ε	error term

[10] The model, thus, is similar to cross-country macroeconomic benchmarking exercises used in the literature, e.g. the CGER methodology for exchange rate assessment based on the macroeconomic balance approach (IMF, 2006).

The baseline model is estimated with the pooled OLS with cluster-robust standard errors with the annual data transformed to 3-year non-overlapping averages, which reduces the size of the dataset to 68 countries observed over 5 periods. For robustness, the specification is also estimated using the data averaged over the years 2005–2008, 10-year averages, pooled OLS, and fixed effects for the panel data.

The baseline model satisfies econometric problems to the extent possible for the purposes of our analysis and takes advantage of the time dimension. 3-year averaging of annual data, common to financial literature, reduces the short-term cyclical effects. The major impediment in econometric analysis comes from potential endogeneity of regressors. Endogeneity associated with potential two-way causality is addressed by lagging the macroeconomic variables by one period, again a common approach used in the literature.

A number of problems arise due to the panel nature of data. Specifically, intra-group correlations may lead to inconsistent estimates for the least squares estimation, something addressed by employing cluster-robust standard errors. The analysis is further complicated by the fact that many relevant variables are jointly determined and correlated, which is addressed by grouping variables and consecutive inclusion of variables in the model so that the collinear terms do not enter the same specification.

Yet another complication is non-stationarity of some of the variables. However, most of the techniques, addressing this issue (e.g., estimation in differences), would eliminate time-invariant effects, including the CE4 dummy. Thus, we also did estimations for the most recent 3-year averages cross-section, to ensure that the observed results are not spurious.

Our main interest is the sign of the CE4 dummy variable throughout alternative specifications. If the hypothesis of underdeveloped financial markets in the CE4 markets is correct, the dummy should have a negative and statistically significant coefficient.

IV. EMPIRICAL RESULTS

Step 1: Macroeconomic Fundamentals

As a first step, we plot real GDP per capita against each of the financial development indicators and examine the relative position of the CE4 nations. Figure 3 plots data for the entire panel data as well as for the latest 3-year average period used in our analysis (2006–2008). A few observations are worth making. First, financial development is strongly positively associated with economic development. Second, all of the CE4 countries lie below the fitted linear regression lines that signify the reference levels of financial development expected based on the experiences of the entire sample. Finally, the figure suggests that the relationship between economic development and financial markets could have a non-linear nature.[11]

Second, we regress financial development indicators on a wider group of macroeconomic variables.

Since it is widely recognized that the overall level of economic development is best captured by per capita income and that economic development stimulates demand for financial services, leading to higher volumes of financial intermediation and increasing the scope of financial services, we start with real GDP per capita as the primary predictor of financial development. However, although per capita income is a catch-all parameter capturing a broad range of structural macroeconomic characteristics strongly associated with national income, it may not pick up the effects of certain other factors important for financial markets. Thus, we control for other factors that may cause deviations from the levels predicted by the stage of economic development.

In particular, we control for the rate of inflation and macroeconomic volatility, measured by instability of inflation rate, as both high inflation rates and inflation volatility prevent full-scale financial intermediation. High levels of inflation make agents less interested in engaging in contractual obligations leading to less liquid markets, while frequently changing inflation would discourage financial intermediation via higher risks and inability to plan in the uncertain environment, in contrast to a situation with high, but stable inflation.

Next, we include trade openness as a proxy for the effects of overall economic integration into the world economy. Higher integration into the world economy should increase efficiency of the financial sector, while higher scale of economic activity and higher exposure to foreign competition may spur investment needs, leading to higher financing needs through debt or equity.

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[11] When splitting countries into the OECD and non-OECD subsamples, we observe steeper trend lines for the former.

Given the contrast between relatively well developed public bond segment and less developed other financial market segments in the CE4 countries, we explicitly test whether public bond market development has any significant implications for the private capital markets and thus include a ratio of public bond market capitalization to GDP as a regressor in a range of specifications. As government bond issuance by definition is determined primarily by fiscal considerations, i.e. by factors different from those for the private sector, it should not create empirical difficulties. The expected effects could be either positive or negative. On the one hand, government bonds, being a risk-free asset, may stimulate private financial markets by providing a reference yield curve. On the other hand, too large public bond markets may be crowding-out the private markets.

Tables 4–6 report the benchmark relationships between macroeconomic fundamentals and each of the financial market development measures.

- As expected, GDP per capita enters positively and highly significantly in most specifications and is robust to inclusion of additional control variables.

- For the private credit market, inflation enters negatively and significantly, trade openness is positive and weakly significant, inflation volatility is negative and weakly significant.

- In the case of the private bond market, only GDP per capita enters positively and significantly, while other variables are insignificant.

- Finally, for the stock market development, GDP per capita enters positively and statistically significantly; in some specifications inflation enters negatively and inflation volatility enters positively, but both are weakly significant.

- Interestingly enough, we do not find any significant effects of the public bond market on any of the private financial markets. It might be helping the development of the private bond market, crowding out the other segments; however, this effect is not pronounced as the variable is insignificant throughout specifications.

- Most importantly, the *CE4 dummy variable is negative and highly significant* throughout specifications for all financial market segments, indicating weak financial development relative to peer economies after controlling for the relevant macroeconomic characteristics. Specifically, the magnitudes suggest that financial markets in the CE4 economies are *at least some 20 percent* below the levels predicted by the model.

Step 2: Adding Institutional Variables

The following step is to test whether the observed negative residual effect, persistent throughout the private financial markets in the CE4 countries, can be explained by institutional factors, which we expect to be positively related to financial development outcomes and hence, to reduce the effect of the CE4 dummy variable, if it is indeed the effect of weak institutions that is preventing proper financial development in these nations.

We include the institutional variables—indicators of government effectiveness, control of corruption, rule of law, and regulatory quality—to test whether their presence reduces the magnitude and significance of the CE4 dummy variable. However, since the institutional variables are highly correlated with each other as well as with real per capita income (Table 3), including them into the regression would not allow disentangling the effect of the stage of development (measured by real GDP per capita) and the effect of individual institutional development characteristics. Thus, to avoid multicollinearity issues, we re-estimate the model by including institutional variables one-by-one but dropping real per capita GDP (Tables 7–9).

As expected, institutional variables enter positively and significantly for all of the financial markets, while their presence *decreases the CE4 dummy in magnitude*, which however *remains significant*. This implies that the institutional variables have superior explanatory power relative to real GDP per capita and that to some extent shallowness of the financial markets in the CE4 countries can be explained by their weak institutional development. In particular, in the sense of reducing the CE4 dummy variable the most, lagging private credit and private bond market in the CE4 countries is best explained by *control of corruption*, whereas for the stock market *government effectiveness* appears to be the most relevant factor.

Step 3: Robustness Checks

For robustness, we check the significance of alternative macroeconomic variables, such as real GDP, GDP growth rate, GDP growth volatility, the ratio of savings to GDP, population size, the ratio of current account to GDP, the ratio of inward FDI stock to GDP, and marginal corporate tax rate. Yet, these variables either do not explain the cross-country variation in financial development better than the "original" macroeconomic fundamentals or turn out to be insignificant.

We also estimate the baseline model with several other techniques that include:

- Pooled OLS model with cluster-robust standard errors for the annual frequency panel dataset (1994–2008).
- Fixed effects model with heteroskedasticity-robust standard errors for the annual frequency panel dataset (1994–2008). The model includes time-invariant fixed effects

for individual countries, including the CE4 countries in lieu of the CE4 dummy variable.[12]

- OLS with heteroskedasticity-robust standard errors for the 10-year averages cross-section. This approach emphasizes long-term relationships between financial development and macroeconomic fundamentals that still hold after medium-term variations in the cross-section data are removed.

- OLS with heteroskedasticity-robust standard errors for the most recent pre-crisis 3-year period available (2006–08). This approach allows assessing effects of relatively tranquil years and alleviates potential problems of averaging over a long time horizon, when the earlier years could be driving the regression results.

The results are rather similar to the ones reported earlier. Real GDP per capita is the most significant predictor of financial development, entering positively and significantly for most of the specifications and the financial segments. Inflation enters negatively significantly in most specifications and inflation volatility enters negatively, but is significant only for the private credit market specifications. Public bond market capitalization as a share of GDP is negative and significant in the fixed effects model, while in most other specifications it is negative, but insignificant. Institutional variables are significant and positive in almost all the cases. Most importantly, and similarly to the results reported earlier, *the CE4 dummy variable enters negatively and significantly* across all specifications, but its magnitude and/or significance is reduced when institutional variables are controlled for.

Step 4: Incorporating IIP Variables

The final empirical exercise we perform is testing whether external financing affects development of domestic financial markets. Existence of external funding may stimulate development of the financial markets or prevent it, depending on the way funds are channeled into the economy. For example, ability of corporates to borrow from abroad would have a negative effect on the development of the financial markets, as in the presence of external funding sources the importance of domestic financial intermediation declines. Meanwhile, borrowing from abroad by financial institutions would increase the supply of capital available domestically, as these funds are eventually re-circulated, and thus would stimulate development of the financial markets.

[12] The fixed effects estimations are hampered by the nature of some explanatory variables—they exhibit low variability over time with most variation along the cross-country dimension and thus, estimation yields inconsistent results. Moreover, fixed effects estimation assumes idiosyncratic time-invariant effects for each country, which conceptually does not fit well into the benchmarking approach as we attempt to understand common patterns across countries for a common benchmark.

Recourse to external financing is, of course, dependent on the state of domestic financial markets, the level of economic development, and macroeconomic stability, which are already included in the regression specifications. Thus, resorting by domestic entities to external financing sources could be a reflection of inability to raise funds domestically and hence, an indication of less developed domestic capital markets. Alternatively, having access to external funding and capacity to consequently process these funds domestically may be an indication of maturity of these markets. For these reasons, the results reported in this section should be interpreted with caution.

We include international investment position (IIP) variables on liabilities to non-residents: direct investment, equity portfolio investment, and debt (including bonds, loans, financial derivatives, trade credit, etc.). We exclude general government and monetary authorities and distinguish between the banking and non-banking sectors when possible.

We find (Tables 10–12) that in the case of private credit, the stock of external debt and equity investment from abroad into the banking sector enters the regression positively and significantly, suggesting recirculation of the external funds. Similarly, for the stock market, the total stock of external debt (invested into the banking and the non-banking sectors) enters positively and significantly, possibly for the same reasons (e.g., recirculation). Finally, in the case of the private bond market, the stock of equity investment from abroad into the non-banking sector enters negatively and significantly suggesting that domestic funding is replaced by foreign.

Meanwhile, inclusion of the IIP variables reduces the magnitude of the *CE4 dummy variable* and makes it *insignificant* for *the private credit market* and *the stock market*, but not for *the private bond market*. Including institutional variables after controlling for the IIP variables only marginally changes the magnitude of the CE4 dummy variable. However, in the case of the private credit and the stock markets, both the institutional and the IIP variables enter significantly, which suggests that the setbacks in the institutional development do play role. In the case of the private bond market the result is different—inclusion of the institutional variables makes the IIP variable insignificant, but not the CE4 dummy.

As mentioned earlier, the results should be interpreted cautiously as the direction of causality is ambiguous, but these results may signify that the misalignment between macroeconomic fundamentals and the level of financial development reflects the use of external financing at least in the case of the stock and private credit markets.

V. CONCLUSION

Financial development in the CE4 countries is lagging relative to economies that are similar in terms of their economic development. While the sizes of the public bond markets are comparable to those in the peer countries, the other financial segments—the market for the private credit, the private bond, and the stock markets—are significantly smaller.

We attempt to establish benchmark values for depth of these markets by linking it to macroeconomic fundamentals and indicators of institutional development. We find that the financial markets in the CE4 countries are significantly shallower than what one would expect given their stage of economic development as measured by real GDP per capita and controlling for other relevant macroeconomic characteristics. An explanation could be underdevelopment of institutions and access to external funding that renders unnecessary further development of some of the financial markets at the scale seen in the peer countries. When accounting for these factors, the gap is eliminated in the case of the equity and the private credit markets. However, the gap of some 15–20 percent remains for the private bond markets.

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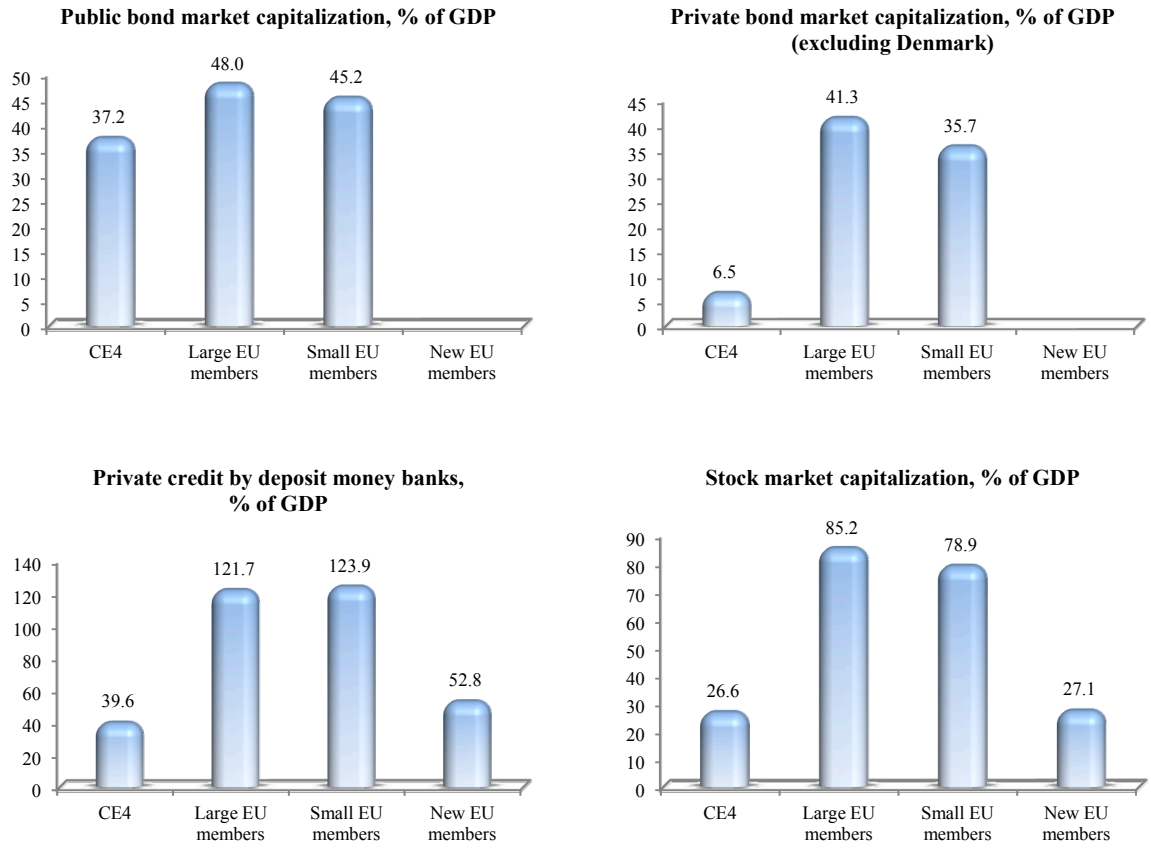
Figure 1. Financial Markets in the CE4 Countries Relative to the EU Economies, 2004–08 Averages

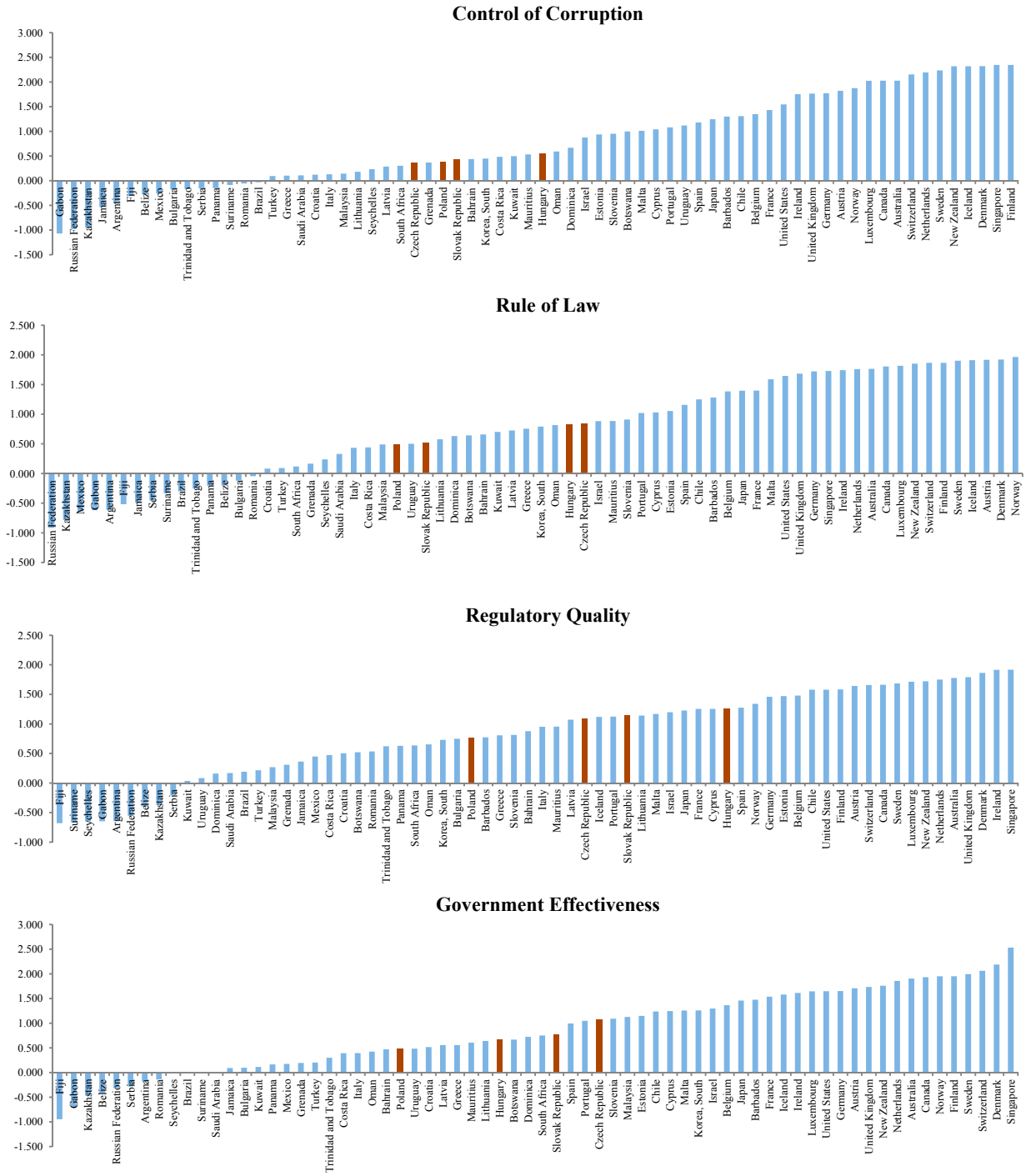
Country groups are defined as follows: CE4 (the Czech Republic, Hungary, Poland, the Slovak Republic), Large EU members (Germany, Spain, France, United Kingdom, Italy), Small EU members (Austria, Belgium, Denmark, Finland, Greece, Ireland, Netherlands, Portugal, Sweden), New EU members (Bulgaria, Estonia, Lithuania, Latvia, Romania, Slovenia). Data for public and private bond markets are not available for New EU members. Data for private bond market are not available for Poland and the Slovak Republic. Denmark is excluded from the sample in the case of the private bond market, given its large mortgage bond market.



Source: Database on Financial Development and Structure (Beck and Demirgüç-Kunt, 2009).

Figure 2. Institutional Development Indicators, 2007

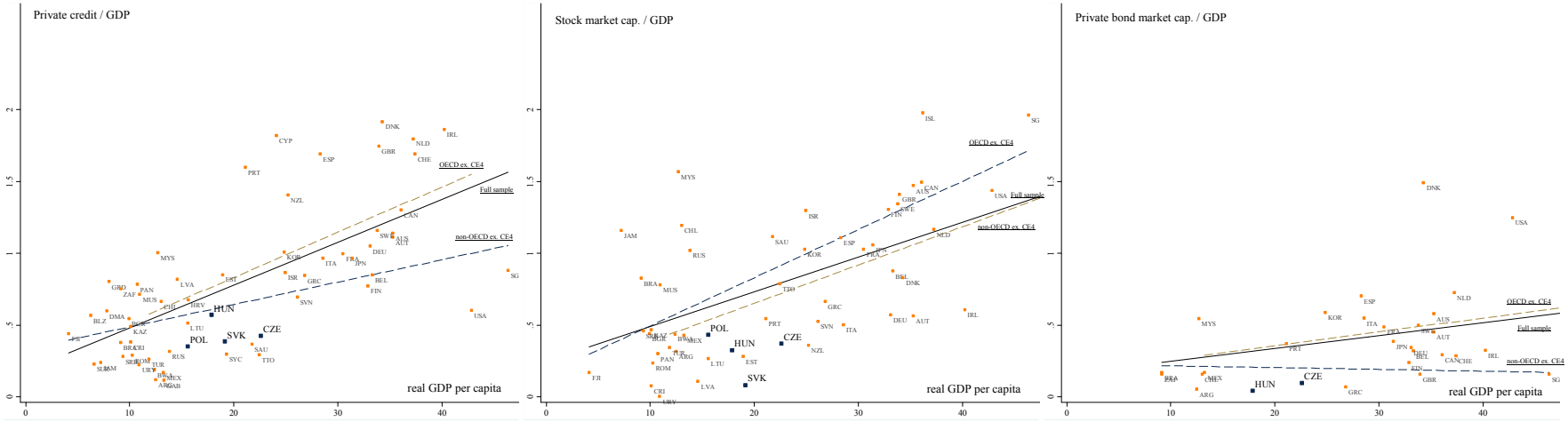
The governance indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. Control of corruption measures the extent to which public power is exercised for private gain. Rule of law measures the extent to which agents have confidence in and abide by the rules of society, e.g. the quality of contract enforcement and property rights. Regulatory quality measures the ability of the government to provide sound policies and regulations. Government effectiveness measures the quality of public services and policy formulation.



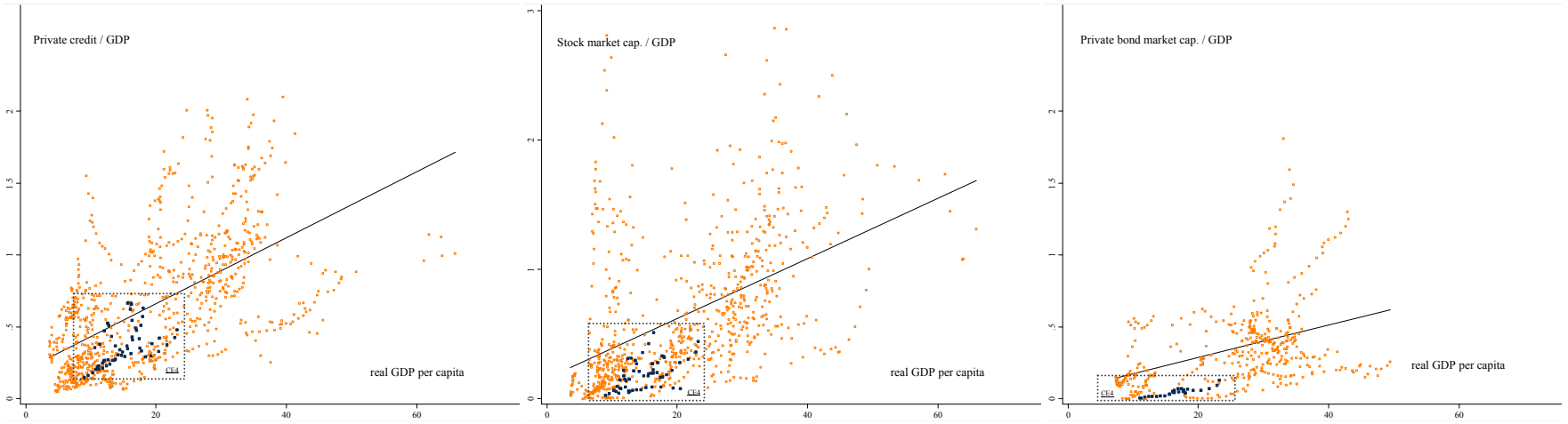
Source: World Bank.

Figure 3. Financial Development Indicators Plotted Against Real GDP Per Capita

3-Year Averages, 2006–08



Panel data, 1994–2008



Source: Authors' calculations.

Table 1. Sample of Countries

N	Country	Code	Income group	N	Country	Code	Income group
1	Argentina	ARG	Upper middle income	35	Jamaica	JAM	Upper middle income
2	Australia	AUS	High income: OECD	36	Japan	JPN	High income: OECD
3	Austria	AUT	High income: OECD	37	Kazakhstan	KAZ	Upper middle income
4	Belgium	BEL	High income: OECD	38	Korea, South	KOR	High income: OECD
5	Bulgaria	BGR	Upper middle income	39	Kuwait	KWT	High income: non-OECD
6	Bahrain	BHR	High income: non-OECD	40	Lithuania	LTU	Upper middle income
7	Belize	BLZ	Upper middle income	41	Luxembourg	LUX	High income: OECD
8	Brazil	BRA	Upper middle income	42	Latvia	LVA	Upper middle income
9	Barbados	BRB	High income: non-OECD	43	Mexico	MEX	Upper middle income
10	Botswana	BWA	Upper middle income	44	Malta	MLT	High income: non-OECD
11	Canada	CAN	High income: OECD	45	Mauritius	MUS	Upper middle income
12	Switzerland	CHE	High income: OECD	46	Malaysia	MYS	Upper middle income
13	Chile	CHL	Upper middle income	47	Netherlands	NLD	High income: OECD
14	Costa Rica	CRI	Upper middle income	48	Norway	NOR	High income: OECD
15	Cyprus	CYP	High income: non-OECD	49	New Zealand	NZL	High income: OECD
16	Czech Republic	CZE	High income: OECD	50	Oman	OMN	High income: non-OECD
17	Germany	DEU	High income: OECD	51	Panama	PAN	Upper middle income
18	Dominica	DMA	Upper middle income	52	Poland	POL	Upper middle income
19	Denmark	DNK	High income: OECD	53	Portugal	PRT	High income: OECD
20	Spain	ESP	High income: OECD	54	Romania	ROM	Upper middle income
21	Estonia	EST	High income: non-OECD	55	Russian Federation	RUS	Upper middle income
22	Finland	FIN	High income: OECD	56	Saudi Arabia	SAU	High income: non-OECD
23	Fiji	FJI	Upper middle income	57	Singapore	SGP	High income: non-OECD
24	France	FRA	High income: OECD	58	Serbia	SRB	Upper middle income
25	Gabon	GAB	Upper middle income	59	Suriname	SUR	Upper middle income
26	United Kingdom	GBR	High income: OECD	60	Slovak Republic	SVK	High income: OECD
27	Greece	GRC	High income: OECD	61	Slovenia	SVN	High income: non-OECD
28	Grenada	GRD	Upper middle income	62	Sweden	SWE	High income: OECD
29	Croatia	HRV	Upper middle income	63	Seychelles	SYC	Upper middle income
30	Hungary	HUN	High income: OECD	64	Trinidad and Tobago	TTO	High income: non-OECD
31	Ireland	IRL	High income: OECD	65	Turkey	TUR	Upper middle income
32	Iceland	ISL	High income: OECD	66	Uruguay	URY	Upper middle income
33	Israel	ISR	High income: non-OECD	67	United States	USA	High income: OECD
34	Italy	ITA	High income: OECD	68	South Africa	ZAF	Upper middle income

Table 2. Summary Statistics for the Variables Used in the Regression Analysis

	Mean	Std. dev.	Min	Max	N. of obs.
A. Financial development indicators					
Private credit / GDP	0.63	0.43	0.06	1.94	324
Private bond market capitalization / GDP	0.33	0.27	0	1.49	155
Stock market capitalization / GDP	0.6	0.52	0	2.61	287
B. Macroeconomic fundamentals					
Log of GDP per capita, PPP	9.67	0.63	8.21	11.04	330
Trade openness	0.89	0.39	0.17	2.01	311
Inflation	8.17	13.85	-2.13	94.9	332
Inflation volatility	-0.53	3.31	-20.57	10.8	320
Public bond market capitalization / GDP	0.36	0.21	0.02	1.02	183
Inward FDI stock / GDP	0.33	0.28	0.01	1.61	315
Marginal corporate tax rate	28.63	8.09	10	55	171
C. Institutional factors					
Control of corruption	0.8	0.94	-1.35	2.49	334
Rule of law	0.75	0.83	-1.27	2.09	337
Regulatory quality	0.76	0.69	-1.36	2.03	340
Government effectiveness	0.83	0.87	-1.19	2.64	339
D. Private sector liabilities to non-residents (IIP)					
IIP direct investment	0.37	0.35	0	2	122
IIP equity portfolio investment (banking sector)	0.1	0.65	0	6.86	195
IIP equity portfolio investment (other sectors)	0.55	3.95	0	42.1	199
IIP debt (banking sector)	0.72	1.91	0	17.13	153
IIP debt (other sectors)	0.38	1.67	0	17.98	152

Table 3. Pairwise Correlations. 3-year Non-Overlapping Averages, 68 Countries, 1994–2008.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly

	Private credit/GDP	Private bond market cap./GDP	Stock market capitalization/GDP	Log of GDP per capita, PPP	Trade openness	Inflation	Inflation volatility	Public bond market cap. / GDP	Inward FDI stock / GDP	Marginal corporate tax rate	Control of corruption	Rule of law	Regulatory quality	Government effectiveness	IIP direct investment	IIP equity portfolio inv.(banking sector)	IIP equity portfolio inv. (other sectors)	IIP debt (banking sector)	IIP debt (other sectors)
Private credit/GDP	1																		
Private bond market capitalization/GDP	0.4***	1																	
Stock market capitalization/GDP	0.5***	0.2**	1																
Log of GDP per capita, PPP	0.6***	0.5***	0.5***	1															
Trade openness	0	0	-0.1	-0.1	1														
Inflation	-0.4***	-0.3***	-0.3***	-0.4***	-0.2***	1													
Inflation volatility	0.2***	0.1	0.2***	0.2***	0	-0.4***	1												
Public bond market capitalization / GDP	0.2**	0.2**	0.1	0.3***	0.1	-0.3***	0.1	1											
Inward FDI stock / GDP	0.3***	-0.1	0.3***	0.1	0.6***	-0.2***	0.1**	0	1										
Marginal corporate tax rate	0	0.2*	0.2*	0.1*	-0.3***	-0.1	0	0.5***	-0.3***	1									
Control of corruption	0.6***	0.4***	0.5***	0.8***	-0.1	-0.4***	0.2***	0.2**	0.1**	0.1	1								
Rule of law	0.7***	0.4***	0.4***	0.8***	0	-0.4***	0.2***	0.2***	0.1	0.1	1.0***	1							
Regulatory quality	0.6***	0.3***	0.5***	0.7***	0.1	-0.4***	0.1	0.2**	0.2***	0	0.8***	0.9***	1						
Government effectiveness	0.7***	0.4***	0.5***	0.8***	-0.1	-0.5***	0.2***	0.2***	0.1**	0.1	0.9***	0.9***	0.9***	1					
IIP direct investment	0.4***	-0.1	0.1	0.2**	0.6***	-0.2**	0.1	-0.1	0.9***	-0.6***	0.2*	0.2**	0.4***	0.2**	1				
IIP equity portfolio inv. (banking sector)	0.2***	0	0.1	0.2***	0.1*	-0.1	0	-0.1	0.5***	0	0.1**	0.2**	0.2***	0.1*	0.6***	1			
IIP equity portfolio inv. (other sectors)	0.2***	0	0.2**	0.4***	-0.1	0	0	-0.1	0.4***	0	0.2**	0.2**	0.2***	0.1*	0.5***	1.0***	1		
IIP debt (banking sector)	0.4***	0.5***	0.3***	0.5***	0.4***	-0.1	0.1	0.2	0.6***	0	0.3***	0.3***	0.3***	0.3***	0.6***	0.9***	1.0***	1	
IIP debt (other sectors)	0.2***	0.3**	0.2***	0.4***	0.1	-0.1	0	-0.2	0.5***	0	0.2**	0.2**	0.2***	0.2*	0.3***	1.0***	1.0***	0.9***	1

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Table 4. Private Credit Market,
3-year Non-overlapping Averages Pooled OLS.

Dependent variable: private credit / GDP. Pooled OLS estimation with cluster-robust standard errors (reported in parenthesis). Panel dataset comprises 68 high income and upper-middle income economies over the period 1994–2008. Observations are 3-year non-overlapping averages. Macroeconomic explanatory variables are lagged one year.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly.

	Private credit / GDP			
	(1)	(2)	(3)	(4)
Log of GDP per capita, PPP	0.433***	0.404***	0.455***	0.462***
	(0.057)	(0.061)	(0.131)	(0.149)
Trade openness		0.134	0.254*	
		(0.103)	(0.149)	
Inflation		-0.008***	-0.006**	-0.020**
		(0.002)	(0.003)	(0.008)
Inflation volatility		-0.014**	-0.003	-0.027
		(0.007)	(0.006)	(0.026)
Public bond market capitalization / GDP			-0.215	0.052
			(0.229)	(0.263)
Inward FDI stock / GDP				-0.021
				(0.254)
Marginal corporate tax rate				-0.015
				(0.011)
CE4	-0.248***	-0.286***	-0.398***	-0.514***
	(0.044)	(0.051)	(0.103)	(0.1)
Constant	-3.490***	-3.263***	-3.712***	-3.122**
	(0.54)	(0.6)	(1.241)	(1.492)
Observations	255	233	133	70
R2	0.41	0.44	0.5	0.58
Adjusted R2	0.41	0.43	0.48	0.53

Table 5. Private Bond Market,
3-Year Non-Overlapping Averages Pooled OLS.

Dependent variable: private bond market capitalization / GDP. Pooled OLS estimation with cluster-robust standard errors (reported in parenthesis). Panel dataset comprises 68 high income and upper-middle income economies over the period 1994–2008. Observations are 3-year non-overlapping averages. Macroeconomic explanatory variables are lagged one year.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly.

	Private bond market capitalization / GDP			
	(1)	(2)	(3)	(4)
Log of GDP per capita, PPP	0.228***	0.255**	0.250**	0.206
	(0.081)	(0.105)	(0.103)	(0.158)
Trade openness		-0.028	-0.035	
		(0.129)	(0.133)	
Inflation		-0.002	-0.002	-0.008
		(0.004)	(0.003)	(0.021)
Inflation volatility		-0.003	-0.002	-0.003
		(0.006)	(0.006)	(0.016)
Public bond market capitalization / GDP			0.089	0.111
			(0.144)	(0.265)
Inward FDI stock / GDP				-0.211
				(0.163)
Marginal corporate tax rate				-0.001
				(0.009)
CE4	-0.221***	-0.193**	-0.186**	-0.238**
	(0.039)	(0.088)	(0.09)	(0.088)
Constant	-1.916**	-2.155**	-2.139**	-1.572
	(0.784)	(0.983)	(0.967)	(1.617)
Observations	123	116	115	58
R2	0.23	0.27	0.28	0.26
Adjusted R2	0.22	0.24	0.24	0.15

Table 6. Equity Market,
3-year Non-overlapping Averages Pooled OLS.

Dependent variable: stock market capitalization / GDP. Pooled OLS estimation with cluster-robust standard errors (reported in parenthesis). Panel dataset comprises 68 high income and upper-middle income economies over the period 1994–2008. Observations are 3-year non-overlapping averages. Macroeconomic explanatory variables are lagged one year.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly.

	Stock market capitalization / GDP			
	(1)	(2)	(3)	(4)
Log of GDP per capita, PPP	0.429***	0.373***	0.152	0.139
	(0.083)	(0.093)	(0.22)	(0.204)
Trade openness		-0.092	0.042	
		(0.118)	(0.179)	
Inflation		-0.003	-0.007*	-0.013
		(0.002)	(0.004)	(0.01)
Inflation volatility		0.013**	0.014*	0.011
		(0.006)	(0.007)	(0.031)
Public bond market capitalization / GDP			-0.101	-0.061
			(0.322)	(0.328)
Inward FDI stock / GDP				0.229
				(0.369)
Marginal corporate tax rate				-0.017
				(0.014)
CE4	-0.372***	-0.315***	-0.534***	-0.727***
	(0.068)	(0.066)	(0.16)	(0.147)
Constant	-3.504***	-2.884***	-0.651	0.026
	(0.799)	(0.942)	(2.115)	(1.97)
Observations	231	215	136	69
R2	0.32	0.33	0.23	0.34
Adjusted R2	0.31	0.31	0.2	0.27

Table 7. The Effects of Institutional Development Variables on the Private Credit Sector, 3-Year Non-Overlapping Averages Pooled OLS.[13]

Dependent variable: private credit / GDP. Pooled OLS estimation with cluster-robust standard errors (reported in parenthesis). Panel dataset comprises 68 high income and upper-middle income economies over the period 1994–2008. Observations are 3-year non-overlapping averages. Macroeconomic explanatory variables are lagged one year.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly.

	Private credit / GDP									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of GDP per capita, PPP	0.455**		0.261*		0.324*		0.181		0.272	
	(0.131)		(0.153)		(0.168)		(0.171)		(0.169)	
Trade openness	0.254*	0.329**	0.240*	0.251*	0.228	0.215	0.231*	0.233*	0.210	0.199
	(0.149)	(0.142)	(0.141)	(0.126)	(0.143)	(0.134)	(0.137)	(0.127)	(0.146)	(0.136)
Inflation	-0.006**	-0.015**	-0.005**	-0.006**	-0.005**	-0.007**	-0.005**	-0.006**	-0.005**	-0.007**
	(0.003)	(0.004)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
Inflation volatility	-0.003	-0.005	-0.003	-0.003	-0.003	-0.004	-0.003	-0.003	-0.003	-0.004
	(0.006)	(0.011)	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Public bond market capitalization / GDP	-0.215	0.022	-0.145	-0.031	-0.181	-0.061	-0.157	-0.097	-0.183	-0.089
	(0.229)	(0.271)	(0.212)	(0.205)	(0.220)	(0.218)	(0.208)	(0.196)	(0.205)	(0.207)
Control of corruption			0.143**	0.240***						
			(0.070)	(0.053)						
Government effectiveness					0.115	0.277***				
					(0.101)	(0.070)				
Rule of law							0.205**	0.289***		
							(0.082)	(0.053)		
Regulatory quality									0.200*	0.350***
									(0.113)	(0.076)
CE4	-0.398***	**-0.573*** **	-0.359***	**-0.382*** **	-0.378***	**-0.403*** **	-0.406***	**-0.436*** **	-0.419***	**-0.486*** **
	(0.103)	**(0.089)**	(0.085)	**(0.069)**	(0.094)	**(0.076)**	(0.085)	**(0.067)**	(0.101)	**(0.074)**
Constant	-3.712**	0.723***	-1.984	0.447**	-2.560*	0.421**	-1.235	0.456***	-2.106	0.417**
	(1.241)	(0.198)	(1.391)	(0.140)	(1.505)	(0.160)	(1.569)	(0.123)	(1.527)	(0.143)
Observations	133	133	133	133	133	133	133	133	133	133
R2	0.497	0.343	0.525	0.500	0.507	0.473	0.531	0.522	0.522	0.495
Adjusted R2	0.474	0.317	0.499	0.476	0.480	0.448	0.505	0.499	0.495	0.470

[13] In Tables 7-9, column (1) corresponds to one of the regressions in Tables 4-6 respectively, while column (2) presents results of the same regression but with real GDP per capita dropped.

Table 8. The Effects of Institutional Development Variables on the Private Bond Market. 3-Year Non-Overlapping Averages Pooled OLS.

Dependent variable: private bond market capitalization / GDP. Pooled OLS estimation with cluster-robust standard errors (reported in parenthesis). Panel dataset comprises 68 high income and upper-middle income economies over the period 1994–2008. Observations are 3-year non-overlapping averages. Macroeconomic explanatory variables are lagged one year.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly.

	Private bond market capitalization / GDP									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of GDP per capita, PPP	0.250**		0.202		0.199		0.205		0.217**	
	(0.103)		(0.129)		(0.119)		(0.132)		(0.106)	
Trade openness	-0.035	-0.003	-0.045	-0.051	-0.051	-0.074	-0.044	-0.058	-0.047	-0.070
	(0.133)	(0.121)	(0.131)	(0.125)	(0.135)	(0.134)	(0.130)	(0.129)	(0.141)	(0.140)
Inflation	-0.002	-0.012**	-0.001	-0.004	-0.001	-0.004	-0.001	-0.002	-0.001	-0.005
	(0.003)	(0.005)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
Inflation volatility	-0.002	-0.010	-0.002	-0.004	-0.002	-0.004	-0.002	-0.002	-0.002	-0.003
	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Public bond market capitalization / GDP	0.089	0.147	0.112	0.183	0.108	0.171	0.106	0.173	0.100	0.161
	(0.144)	(0.146)	(0.157)	(0.143)	(0.154)	(0.141)	(0.154)	(0.140)	(0.155)	(0.139)
Control of corruption			0.040	0.119*						
			(0.082)	(0.064)						
Government effectiveness					0.050	0.154*				
					(0.099)	(0.080)				
Rule of law							0.038	0.144**		
							(0.079)	(0.063)		
Regulatory quality									0.041	0.167*
									(0.104)	(0.097)
CE4	-0.186**	**-0.250****	-0.168*	**-0.159***	-0.173*	**-0.169***	-0.185**	**-0.201****	-0.187**	**-0.217****
	(0.090)	**(0.072)**	(0.093)	**(0.088)**	(0.093)	**(0.085)**	(0.089)	**(0.078)**	(0.091)	**(0.080)**
Constant	-2.139**	0.359**	-1.717	0.187	-1.697	0.148	-1.736	0.171*	-1.853*	0.176
	(0.967)	(0.118)	(1.144)	(0.127)	(1.057)	(0.120)	(1.187)	(0.100)	(0.946)	(0.114)
Observations	115	115	115	115	115	115	115	115	115	115
R2	0.277	0.159	0.282	0.241	0.282	0.246	0.280	0.249	0.280	0.232
Adjusted R2	0.237	0.120	0.235	0.199	0.235	0.204	0.233	0.207	0.232	0.189

Table 9. The Effects of Institutional Development Variables on the Equity Market. 3-Year Non-Overlapping Averages Pooled OLS.

Dependent variable: stock market capitalization / GDP. Pooled OLS estimation with cluster-robust standard errors (reported in parenthesis). Panel dataset comprises 68 high income and upper-middle income economies over the period 1994–2008. Observations are 3-year non-overlapping averages. Macroeconomic explanatory variables are lagged one year.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly.

	Stock market capitalization / GDP									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of GDP per capita, PPP	0.152		-0.190		-0.311		-0.203		-0.147	
	(0.220)		(0.261)		(0.254)		(0.282)		(0.248)	
Trade openness	0.042	0.066	0.010	0.004	-0.060	-0.042	0.008	0.008	-0.036	-0.029
	(0.179)	(0.161)	(0.170)	(0.179)	(0.173)	(0.194)	(0.168)	(0.178)	(0.189)	(0.197)
Inflation	-0.007*	-0.010**	-0.004	-0.003	-0.004	-0.003	-0.005*	-0.004*	-0.005	-0.004*
	(0.004)	(0.004)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Inflation volatility	0.014*	0.014*	0.014*	0.014*	0.014*	0.014*	0.014*	0.014*	0.014	0.013
	(0.007)	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)	(0.007)	(0.009)	(0.008)
Public bond market capitalization / GDP	-0.101	-0.038	0.029	-0.046	0.013	-0.085	-0.016	-0.078	-0.044	-0.089
	(0.322)	(0.295)	(0.276)	(0.244)	(0.264)	(0.246)	(0.284)	(0.263)	(0.288)	(0.262)
Control of corruption			0.254**	0.183**						
			(0.100)	(0.079)						
Government effectiveness					0.408**	0.252**				
					(0.134)	(0.103)				
Rule of law							0.266**	0.171*		
							(0.119)	(0.097)		
Regulatory quality									0.333**	0.253**
									(0.139)	(0.124)
CE4	-0.534**	**-0.597*** **	-0.460**	**-0.597*** **	-0.458**	**-0.597*** **	-0.541***	**-0.597*** **	-0.567***	**-0.597*** **
	(0.160)	**(0.127)**	(0.134)	**(0.133)**	(0.131)	**(0.138)**	(0.141)	**(0.127)**	(0.154)	**(0.134)**
Constant	-0.651	0.844***	2.392	0.616***	3.431	0.556***	2.559	0.668***	1.981	0.609***
	(2.115)	(0.193)	(2.449)	(0.135)	(2.356)	(0.125)	(2.657)	(0.148)	(2.334)	(0.143)
Observations	136	136	136	136	136	136	136	136	136	136
R2	0.235	0.221	0.305	0.294	0.332	0.307	0.281	0.271	0.291	0.284
Adjusted R2	0.199	0.191	0.267	0.261	0.295	0.275	0.241	0.237	0.252	0.251

Table 10. The Effects of IIP Variables, 3-Year Non-Overlapping Averages Pooled OLS.

Regression results dropping insignificant variables and including IIP variables. The sample includes high income and upper-middle income economies (68) over the period 1994–2008. Observations are 3-year non-overlapping averages based on complete 3-year observations. Macroeconomic explanatory variables are lagged one year. Cluster-robust standard errors are reported in parenthesis.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly.

	(1)	(2)	(3)	(4)
	Private credit / GDP	Private credit / GDP	Private bond market capitalization / GDP	Stock market capitalization / GDP
Log of GDP per capita, PPP	0.304***	0.296***	0.322***	
	(0.075)	(0.077)	(0.090)	
Trade openness	-0.302**	-0.307**		-0.720***
	(0.130)	(0.126)		(0.152)
Inflation	-0.004***	-0.003*		
	(0.001)	(0.002)		
Inflation volatility		0.008*		0.0252**
		(0.004)		(0.010)
IIP debt + equity portfolio investment (banks)	0.485***	0.545***		
	(0.106)	(0.080)		
IIP equity portfolio investment (other sectors)			-0.159*	
			(0.090)	
IIP debt and other liabilities (banks + other sectors)				0.587***
				(0.171)
CE4	**-0.103**	**-0.0882**	-0.212***	**-0.0190**
	(0.083)	**(0.078)**	(0.038)	**(0.146)**
Constant	-2.116**	-2.068**	-2.840***	0.893***
	(0.783)	(0.799)	(0.853)	(0.149)
Observations	110	106	85	108
Adjusted R2	0.74	0.75	0.32	0.39
R2	0.752	0.763	0.347	0.409

Table 11. The Effects of IIP and Institutional Development Variables, Dropping GDP Per Capita.

Regression results dropping insignificant variables and including IIP variables. Institutional development is assessed by the government effectiveness variable for brevity as the institutional variables are highly correlated. The sample includes high income and upper-middle income economies (68) over the period 1994–2008. Observations are 3-year non-overlapping averages based on complete 3-year observations. Macroeconomic explanatory variables are lagged one year. Cluster-robust standard errors are reported in parenthesis.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly.

	(1)	(2)	(3)	(4)	(5)
	Private credit / GDP	Private credit / GDP	Private bond market capitalization / GDP	Private bond market capitalization / GDP	Stock market capitalization / GDP
Trade openness	-0.371***	-0.382***			-0.584***
	(0.129)	(0.124)			(0.145)
Inflation	-0.005***	-0.006**			
	(0.001)	(0.002)			
Inflation volatility		0.004			0.014
		(0.005)			(0.009)
Public bond market capitalization / GDP				0.103	
				(0.120)	
IIP debt + equity portfolio investment (banks)	0.537***	0.611***			
	(0.116)	(0.094)			
IIP equity portfolio investment (other sectors)			-0.157	-0.139	
			(0.111)	(0.107)	
IIP debt (banks + other sectors)					0.406**
					(0.177)
Government effectiveness	0.171***	0.154**	0.205**	0.201**	0.221**
	(0.057)	(0.057)	(0.085)	(0.084)	(0.086)
CE4	**-0.084**	**-0.060**	-0.212***	-0.199***	**-0.052**
	(0.106)	**(0.100)**	(0.0341)	(0.0281)	**(0.120)**
Constant	0.708***	0.707***	0.096	0.052	0.645***
	(0.119)	(0.123)	(0.079)	(0.087)	(0.158)
Observations	110	106	85	84	108
Adjusted R2	0.71	0.72	0.28	0.28	0.45
R2	0.721	0.735	0.309	0.316	0.479

Table 12. The Effects of IIP And Institutional Development Variables, with GDP Per Capita Included.

Regression results dropping insignificant variables and including IIP variables. Institutional development is assessed by the government effectiveness variable for brevity as the institutional variables are highly correlated. The sample includes high income and upper-middle income economies (68) over the period 1994–2008. Observations are 3-year non-overlapping averages based on complete 3-year observations. Macroeconomic explanatory variables are lagged one year. Cluster-robust standard errors are reported in parenthesis.

Note: *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels correspondingly.

	(1)	(2)	(3)	(4)	(5)
	Private credit / GDP	Private credit / GDP	Private bond market capitalization / GDP	Private bond market capitalization / GDP	Stock market capitalization / GDP
Log of GDP per capita, PPP	0.273***	0.292**	0.226***	0.235***	-0.206
	(0.097)	(0.117)	(0.068)	(0.077)	(0.291)
Trade openness	-0.301**	-0.307**			-0.636***
	(0.130)	(0.127)			(0.186)
Inflation	-0.004***	-0.003*			
	(0.001)	(0.002)			
Inflation volatility		0.008*			0.016
		(0.004)			(0.011)
Public bond market capitalization / GDP	0.483***	0.545***			
	(0.107)	(0.081)			
IIP debt + equity portfolio investment (banks)			-0.179	-0.185*	
			(0.107)	(0.099)	
IIP equity portfolio investment (other sectors)				-0.0267	
				(0.108)	
IIP debt (banks + other sectors)					0.453**
					(0.186)
Government effectiveness	0.030	0.004	0.0941	0.0903	0.336*
	(0.071)	(0.079)	(0.099)	(0.103)	(0.180)
CE4	**-0.102**	**-0.088**	-0.195***	-0.198***	**-0.0292**
	(0.083)	**(0.077)**	(0.024)	(0.023)	**(0.134)**
Constant	-1.847*	-2.030*	-2.004***	-2.081***	2.548
	(0.941)	(1.126)	(0.604)	(0.667)	(2.779)
Observations	110	106	85	84	108
Adjusted R2	0.74	0.75	0.34	0.33	0.46
R2	0.753	0.763	0.368	0.368	0.489