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DOES FINANCIAL INFORMATION TRANSPARENCY AND OBJECTIVITY MATTER FOR STOCK MARKET DEVELOPMENT? A PANEL REGRESSION ANALYSIS FOR THE SELECTED EUROPEAN COUNTRIES

JAKOŚĆ INFORMACJI FINANSOWEJ I ROZWÓJ GIEŁD PAPIERÓW WARTOŚCIOWYCH: BADANIE DANYCH PANELOWYCH DLA GOSPODAREK EUROPEJSKICH

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Summary: The paper investigates whether financial transparency and objectivity matter for stock market development. We test this hypothesis by using a sample of 38 selected European economies for the period 2006-2014 by applying dynamic panel regression analysis (Generalized Method of Moments). The strength of auditing and reporting standards (SARS) is used as the approximated variable for measuring the financial transparency and objectivity, while the stock market capitalization relative to GDP is a commonly used variable for stock market development. The estimated results indicate that financial information quality has a positive and significant impact on stock market development after controlling for the standard macroeconomic and financial specific stock market determinants, suggesting that financial reporting quality is one of the most important determinants of stock market development. The effects of financial reporting and auditing standards to stock market development are much more significant in the case of the non-EU countries.

Keywords: financial information, stock markets development, Generalized Method of Moments, European economies.

Streszczenie: W artykule zbadano czy przejrzystość finansowa i obiektywizm mają znaczenie dla rozwoju rynku akcji. Testujemy tę hipotezę dla próby 38 wybranych gospodarek europejskich w latach 2006-2014 poprzez zastosowanie analizy regresji w panelu dynamicznym (uogólniona metoda momentów). Siła standardów audytu i sprawozdawczości (SARS) jest wykorzystywana jako przybliżona zmienna do pomiaru przejrzystości finansowej i obiektywności, a kapitalizacja rynkowa akcji w stosunku do PKB jest powszechnie używaną zmienną do pomiaru rozwoju giełdowego. Szacowane wyniki wskazują, że jakość informacji finansowych ma pozytywny i znaczący wpływ na rozwój rynku akcji po uwzględnieniu standardowych uwarunkowań makroekonomicznych i finansowych na konkretnych rynkach, co sugeruje, że jakość sprawozdawczości finansowej jest jednym z najważniejszych czynników wpływających na rozwój giełdy. Skutki sprawozdawczości finansowej i standardów rewizji finansowej w zakresie rozwoju giełd są znacznie większe w przypadku krajów nienależących do UE.

Słowa kluczowe: informacja finansowa, rozwój giełd, uogólniona metoda momentów, gospodarki europejskie.

1. Introduction

The main aim of the study is to investigate the impact of financial information transparency on stock markets development for a sample of 38 European economies in the period 2006-2014. The dynamic panel data specifications are applied to identify both internal and cross-country effects.

The estimated results demonstrate a positive and significant relationship between financial information quality and capital markets development after controlling for fundamental macroeconomic and institutional stock market determinants, such as growth of real GDP, inflation rate, bank credit, institutional capacity and corporate ethics. These results indicate that the quality of financial information facilitates stock market development and the public trust in politicians, while the corporate board efficiency amplifies the potential positive effects of financial information quality on stock markets development. Additional analysis was undertaken to check the robustness of the results by applying alternative estimation method (GMM) and additional controls capturing the institutional environment potentially correlated with reporting quality.

The rest of this paper is organized as follows. In Section 2, we present a selective literature review of the quality of financial information and stock market development, including papers concerned with various aspects of institutional and accounting dimension. In Section 3 we present our data and describe the research methodology framework used in the empirical work. We discuss the statistical problems associated with panel estimation of stock markets determinants and then explain our preferred econometric method – the GMM. At the end of this Section, we present the estimated results and the main findings. Section 4 presents conclusions and we also suggest topics for future investigation.

2. Literature review

The earlier stream of the empirical literature related to stock market development is focused on macroeconomic and institutional determinants. For example, Garcia and Lin [1999] found that a set of macroeconomic factors are more important factors of stock market development, while several other studies have shown that legal protections for investors are associated with capital market development [Djankov at el. 2007]. Some studies in this stream of literature have suggested that accounting and disclosure quality is associated with capital market development, based on cross--sectional regression estimates [La Porta et al. 1997, 2008]. Additionally, Friedman [2015] went further and used industry leaders' perceptions of standards' strength as persons who are incorporating the enforcement of the standards. In a panel of over 140 countries from 2002-2013, Friedman [2015] confirms empirically that stronger auditing and reporting standards are positively associated with subsequent levels of equity market development. Also, the research verifies with the Executive Option Survey, that perceived strength of auditing and reporting standard (PSARS) is significantly correlated with the probability that firms use high-quality auditors and the probability that firms use high-quality reporting standards, so it has explanatory power for country differences in market development. Additionally, the author showed that public trust in politics and managers affects auditing and reporting standards.

The accounting literature related to financial markets is focused on the economic consequences of adoption of IFRS: improving the liquidity of the market [Christensen et al. 2013], as well as decreasing the investment risks [Daske et al. 2008] and improving investor protection and maintenance of investor confidence [European Commission 2015].

The paper contributes to the literature by filling the gap related to the empirical investigation of how the role and the importance of financial information quality influence stock market development. Some previous studies have examined the influence of accounting and disclosure quality on stock markets development based on cross-sectional estimation with potential endogeneity bias [La Porta et al. 1997, 2008]. To date, only one paper [Friedman 2015] used the strength of auditing and reporting standards to measure the quality of financial information and addressed the possible endogeneity issue.

In this paper, we focus our research on European economies (EU and non-EU countries) and we use several additional macroeconomic and financial specific determinants (foreign direct investment, stock price volatility, and banking sector development) as controlling variables. The estimated results based on the models' specification found more robust evidence that the quality of financial information (measured by the strength of auditing and reporting standards) is positively associated with stock markets development in the sample of 38 European countries.

3. Empirical work

3.1. Research methodology framework

The aim of the empirical work within this paper is to examine how the strength of financial auditing and reporting standards affects capital markets development in the sample of 38 European economies. In order to fulfil this goal, dynamic panel data model (GMM) is used, because it accounts for the endogeneity of lagged dependent variable and for the potential endogeneity of some other explanatory variables, such as omitted variables and error measurement – well-known econometric problems that can produce potential bias in coefficients and standard errors estimations.

The GMM estimator introduced by Arrelano and Bover [1995] and further developed by Blundell and Bond [1998] is appropriate for panel data like the one used in this paper with relatively large N (number of countries) and small T (number of years).

The GMM model is presented by the following equation:

$$SMD_{it} = \alpha SMD_{i,t-1} + \beta X_{it} + \gamma F_{it} + \varphi CG + \lambda Y_i + \mu_i + u_i,$$

where, SMD_{it} is the stock markets development in country i over time period t measured by the stock market capitalization relative to GDP; $SMD_{i,t-1}$ is a lagged value of stock market development, i.e. lagged dependent (endogenous) variable which allows for a dynamic structure of the model: vector, X_{it}, contains macroeconomic specific determinants which vary over i and t; vector, F_{it}, represents the financial specific determinants of stock market development, while the vector, FI_{it}, is represented by strength of auditing and reporting standards (SARS), as a proxy variable that captures the quality of financial information – the main variable of interest in this empirical work. The symbol, Y_i in the equation is related to interaction of the variable that measures whether the EU status of the countries is important in the relationship between the quality of financial information and stock markets development, while, the symbol, CG_{it}, represents the quality of corporate governance measured by the efficacy of corporate boards.

The other part of the equation contains individual (unobservable country--specific) effects μ_i, along with the independently identically distributed stochastic disturbance term u_{it}. According to the capital market and macroeconomic theory we defined growth rate, investment rate, stock price volatility, quality of financial information and corporate governance as endogenous variables, while inflation rate and foreign direct investment are identified as exogenous variables.

The data is first transformed using forward orthogonal deviations [Arellano, Bover 1995]. Like first differencing, this transformation eliminates the individual error components. Unlike first differencing, it is robust to gaps in panel data and keeps lagged variables orthogonal to contemporaneous error terms.

Some features of the GMM are addressed as important. First, an identifying assumption is that the errors do not display second-order autocorrelation. Second, the "two-step" GMM estimator that allows for heteroscedasticity and cross-correlation can result in downward-biased standard errors, therefore we use the Windmeijer [2005] small-sample correction in the reported estimates.

3.2. Sample and data description

The broadest dataset used in the empirical research includes 28 EU countries (Austria, Belgium, Croatia, Czech Republic, Demark, Estonia, Hungary, Latvia, Lithuania, Finland, France, Iceland, Ireland, Italy, Germany, Greece, Netherlands, Norway, Portugal, Poland, Romania, Spain, Sweden, the Slovak Republic, Switzerland and Slovenia), 4 EU candidate countries (Macedonia, Serbia, Montenegro, and Turkey), 1 potential candidate (Bosnia and Herzegovina) and 5 non-EU European countries (Armenia, Georgia, Kazakhstan, the Russian Federation and Ukraine) and covers annual data in the period 2006-2014. The choice of dataset is based on the availability of data for European countries.

Proxies for capital markets development include Stock Market Capitalization relative to GDP and Stock Market total traded value relative to GDP. Stock Market Capitalization is the equity market's total capitalization as a percentage of GDP in year *t*, while Stock Market total traded value relative to GDP is the value of listed company stock traded during year *t*.

The quality of financial information, as the main interest variable in the model, is measured by the strength of auditing and reporting standards (SARS), as a proxy variable. Many studies found that high quality of reporting standards [Daske et al. 2008; Jara et al. 2011], as well as their acceptability and enforceability, influence the users′ perception of quality of financial information [Wulandari, Rahman 2004; Ball 2006; Barth et al. 2008; Chen et al. 2002]. The data for SARS is derived by the Executive Opinion Survey (EOS) and reported from the World Economic Forum (WEF). The efficiency of corporate boards' governance is taken from the Executive Opinion Survey (EOS) as an additional proxy variable for the quality of corporate governance. The numerical scores for these proxy variables that measure the quality of financial information and efficiency of corporate governance are country-year average responses to prompts in the Executive Opinion Survey, as reported in Global Competitiveness Reports.

Variables representing macroeconomic determinants of stock market development include: annual growth rate of real GDP as a measure of economic performance; inflation rate as a measure of macroeconomic stability, and investment rate measured by the gross fixed capital formation relative to GDP. The data of these variables are taken from the World Bank's World Development Indicators data set.

Proxies for financial specific determinants are Bank Credit to private sector relative to GDP which represent the banking sectors development and Stock price

volatility (the average of the 360-day volatility of the national stock market index) which measure the stock market (in) stability. The main source of these variables is the Global Financial Development Indicators database reported by World Bank.

The summary statistics for all variables are reported in Table 1.

Table 1. The summary statistics for the main variables in the models

Variable	Description	Mean	Stand. Dev.	Min.	Max.	Obs.
Economic growth	Annual rate of economic growth rate, %	1.85	4.76	–14.8	13.7	266
Inflation rate	Percentage change of average annual price, %	4.14	3.59	–4.47	25.23	259
Financial information quality	Strength of auditing and reporting standards perception	4.99	0.79	3.05	6.53	264
Stock Market capitalization	The value of domestic shares traded on the stock market relative to GDP	47.46	41.98	0.84	265.12	265
Stock Market total traded value	Total traded value as a percent of GDP	36.19	46.50	0.005	256.30	258
Stock price volatility	Average of the 360-day volatility of the national stock market index.	24.06	12.08	0.09	99.03	246
Bank private credit	Bank domestic credit to private sector, % of GDP	85.74	49.23	8.84	312.15	256
Efficiency of corporate governance	Perception of corporate governance efficiency	4.72	0.60	3.43	6.09	264
Investment rate	Gross domestic fixed investment, % of GDP	22.90	4.56	12.62	39.76	262
EU	Dummy variable for EU membership	1 – Emerging European economies, 0 – Non-EU countries				

Source: own study based on World Bank [2016a, 2016b].

3.3. Estimated results and discussion

The estimated results of all dynamic panel specification models with robust two-step standard errors and the standard post-estimation tests are reported in Table 2. The analysed sample includes 38 European economies for the period 2006-2014.

The coefficient of the lagged stock markets development [stock market development (t–1)] as a right-side variable (endogenous regressor) of each dynamic panel model is expectedly positive and significant, indicating that stock market

capitalization in the previous year has positive impact on current stock market development.

Table 2. Estimated results by Generalized Method of Moments

DEPENDENT VARIABLE: Stock market development	(Model 1)	(Model 2)	(Model 3)
INDEPENDENT VARIABLES:			
L1. Stock market development	0.384***	0.402***	0.361***
	(0.000)	(0.000)	(0.000)
Investment rate	0.672***	0.583***	0.596***
	(0.000)	(0.000)	(0.000)
Growth rate	0.891***	0.908***	0.899***
	(0.000)	(0.000)	(0.000)
Banking sector development	0.269***	0.260***	0.339***
	(0.000)	(0.000)	(0.000)
Inflation rate	–1.266***	–1.312***	–1.264***
	(0.003)	(0.000)	(0.001)
Stock price volatility	–0.447***	–0.457***	–0.457***
	(0.000)	(0.000)	(0.005)
Financial information transparency	7.321***	10.872***	10.601***
	(0.008)	(0.000)	(0.000)
Corporate governance quality	9.054***	9.692***	14.870***
	(0.000)	(0.000)	(0.000)
Financial information transparency*EU status		–3.634**	
		(0.025)	
Corporate governance quality*EU status			–6.139***
			(0.004)
Constant	–78.794	–84.776	–102.772
	(0.000)	(0.000)	(0.000)
Sargan test (*p*-value)			
(Ho: instruments are valid)	0.0889	0.0642	0.0811
Arellano-bond AR(2) test (*p*-value) (Ho: no second order serial correlation)	0.56	0.25	0.31
Number of observations	206	206	206
Number of countries	36	36	36

Note: ***statistical significance at the 1% level, ** at 5% level, * at the 10% level (in parenthesis are *p*-values). All models are estimated by using two-step standard errors.

Source: own study.

According the results of all three models reported in the Table 2, growth rate of real GDP and foreign direct investment are positively and significantly associated with stock markets development, while inflation rate and stock price volatility, as measures of macroeconomic and stock price stability, have negative influence on stock market activity. Moreover, the results show that banking sector and stock market are complementary, suggesting that the well-developed banking sectors co-exist with big stock markets. Most importantly, the estimated results demonstrate positive and significant relationship between financial information quality and stock markets development after controlling for fundamental macroeconomic and financial specific determinants. These results indicate that the quality of financial information facilitates the stock market development in European economies. Actually, potential investors are more encouraged to engage in stock markets when the auditing and reporting standards ensure the transparency and objectivity of financial information by listed companies.

Additionally, the efficiency of corporate governance, as additional explanatory variable related to strength of auditing and reporting standards, was included in the model. The coefficient of corporate governance quality and stock market development is found significantly positive, while the quality of financial information remained important stock market determinant. Finally, it was not found that EU status of the countries has a significant influence on the relationship between the quality of financial transparency and stock market development.

We have carried out several standard specification tests (Hansen test and Arellano-Bond test for AR(2)) in order to verify the reliability of our estimates. The result of the Hansen test supports the validity of the over-identifying restrictions (the p-value is under the critical value, so we failed to reject the null hypothesis that the instruments are valid), while the Arellano-Bond test AR(2) indicates the absence of second order serial correlation in all regressions (the p-value is not significant, so we failed to reject the null hypothesis for no second order serial correlation).

4. Conclusion

The estimated results based on dynamic panel regression analysis (GMM) for 38 European countries in the period 2006-2014 demonstrate positive and significant relationship between financial information transparency and capital markets development after controlling for macroeconomic and financial specific stock market determinants. However, the most significant impact of financial information transparency on stock market development is found in the case of non-EU countries. Additionally, the results suggest that growth rate and foreign direct investment are positively and significantly associated with stock markets development, while inflation rate and stock price volatility, as measures of macroeconomic and stock price stability, have negative influence on stock market activity. Moreover, the

results showed that banking sector and stock market are complementary, suggesting that the well-developed banking sectors co-exist with big stock markets.

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