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Do Transparency and Anti-Monopoly Policies Matter for Financial Development? Evidence from a Panel ARDL-PMG Approach

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ABSTRACT

We examine the effect of macroeconomic stability, transparent government policies, and anti-monopoly policies on financial market development using extensive panel data of 113 countries over the period 2007 to 2017. By applying ARDL-PMG and controlling for GDP, trade openness, and market size, our findings reveal that macroeconomic stability fosters financial market development in both developing and developed countries. Effective transparency policies facilitate the link between macroeconomic stability and financial market development in the long-run. Furthermore, we find that anti-monopoly policies curb corruption and bureaucratic power to improve financial markets in the short-run. Still, a higher level of competition is more vulnerable to information asymmetry and adverse selection in the long-run.

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Macroeconomic stability; anti-monopoly policies; transparency policies; financial market development; panel data analysis; PMG estimator

1. Introduction

Developed financial markets stimulate long-term economic growth by facilitating banking activities, foreign direct investment flows, and efficient allocation of resources along with the reduction in the cost of borrowings (Cherif & Dreger, 2016; Mukhtarov et al., 2020). Nonetheless, a stable macroeconomic environment and effective government policies are essential to safeguard the sustainability of financial systems (Abubakar & Kassim, 2018; Aluko & Ibrahim, 2020). To achieve market efficiency, countries have advanced the norm of transparency and openness by adopting access-to-information laws. Economies with more transparent government policies generally have high-income levels, press freedom, and superior technological infrastructure (Relly & Sabharwal, 2009). Similarly, a certain level of competition facilitates the financial sector to achieve market power through better earning ability, leverage, and efficiency (Kasman & Carvallo, 2014). Both monopoly and monopsony power distort free markets, hinder innovation, and leads to financial instability (Blair & Harrison, 2010; Noman, Gee, & Isa, 2018; Yang, 2019). Thus, the effectiveness of anti-monopoly policies may restrict major

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financial institutions to control the market and increase the cost of finance above their marginal revenue.

Considering the role of government transparency and anti-monopoly policy in promoting macroeconomic stability and financial market development, this study extends the related literature at the global level using a Panel ARDL-PMG approach. First, we estimate the underexplored effect of macroeconomic stability on financial market development using the sub-indexes of Global Competitive Index (GCI) as the evidence from disaggregate macroeconomic variables are largely mixed (Abubakar & Kassim, 2018; Aluko & Ibrahim, 2020; Ehigiamusoe, Lean, & Chan, 2020; Garcia & Liu, 1999). Macroeconomic stability fosters the financial development by reducing the vulnerability to the influence of external shocks (Vasylieva et al., 2018) and stimulating fairly constant output growth (Bourguignon, 2020). Second, we explore the effect of government transparency and effective anti-monopoly policies on financial market development as a certain level of competition and transparency is necessary for the proper functioning of markets. By curbing corruption and providing greater access to information, transparency of government policy-making builds trust in financial institutions and mitigates market anomalies which promote financial market development (Huang, Li, & Chen, 2019). Third, we estimate both short and long-term relationships among macroeconomic stability, government transparency, anti-monopoly policy, and financial market development using the ARDL-PMG approach, which is categorized as an error-corrected model. This approach eliminates the endogeneity issue by incorporating the lag length for both exogenous and endogenous variables (Pesaran, Shin, & Smith, 1999). This method produces consistent normal distributed and asymptotical estimates after accounting for individual characteristics due to the use of the maximum likelihood method. Although vector error correction model (VECM) is also an efficient model to estimate short- and long-term equations, it assumes series to follow random walk and I(1) order of integration. Generalized method of moments (GMM) is also a consistent solution deal with endogeneity; however, researchers have identified weak instrument problem of the GMM estimator (Hayakawa & Qi, 2020).

For robustness checks, we further segregate the main panel into three sub-panels based on the income level of countries. In general, our results show that macroeconomic stability is essential to develop financial markets in both the short and long-run. However, government transparency facilitates the link between macroeconomic stability and financial market development in the long-run only. Furthermore, we find that anti-monopoly policies curb corruption and bureaucratic power to improve financial markets in the short-run. Still, a higher level of competition is exposed to adverse selection risk in the long-run. Nonetheless, in the case of low-income countries, transparent government policies play no significant role in improving financial markets. In contrast, anti-monopoly policy advances their markets in both the short and long-run.

The paper proceeds as follows: Section 2 critically discusses the literature review and theoretical framework, Section 3 provides the details on data and methodology. Section 4 shows the analysis and results. Lastly, Section 5 recapitulates the main conclusions, limitations, and directions for future studies.

2. Literature review

Financial development plays a vital role in economic development due to the efficient utilization of funds by dynamic investment agents. A wide range of recent studies builds a positive link between financial development and economic growth (Durusu-Ciftci, Ispir, & Yetkiner, 2017; Erdoğan, Yıldırım, & Gedikli, 2020). Continuous development of financial markets also leads to improved financial transaction services, mobilized savings, and profitable enterprises (Agyemang, Gatsi, & Ansong, 2018; Ouma, Odongo, & Were, 2017). Financial markets facilitate the smooth flow of savings and resources in a way that results in cost-effective investment decisions and a higher level of a firm's productivity (Madura, 2020). However, the financial institutions need to be reliable, transparent, and open to maximize the ventures' profit and protect their investors from political interference (Kidwell et al., 2016). However, moral hazard and adverse selection hinder the sustainability of the financial system (Batuo, Mlambo, & Asongu, 2018).

Governments may sort good and bad credit risks to mitigate adverse selection issues. At the same time, the moral hazard situation can be avoided by imposing restrictions on borrowers using specific mechanisms to enhance loan repayment behavior. Nonetheless, the excessive intervention of government in financing activities may interfere with signaling mechanisms and lead to an inefficient allocation of resources (Akerlof, 1978). In the case of financial instability, the financial system cannot mitigate risks, mobilize savings, or facilitate the exchange of goods and services (Batuo et al., 2018). Eichengreen and Leblang (2003) also highlighted that fragility of the financial system is caused by unsustainable and inconsistent policies coupled with an unstable macroeconomic environment.

Based on the aforementioned arguments, we argued that macroeconomic stability is essential for financial stability and market development. Using Maastricht Criteria and PMG estimations, Ehigiamusoe et al. (2020) found a significant influence of macroeconomic stability on financial market development in West African countries. Similarly, utilizing two-step system GMM model, Abubakar and Kassim (2018) analyzed OIC countries while Aluko and Ibrahim (2020) selected sub-Saharan region to corroborate that financial institutions perform more effectively in the presence of stable macroeconomic environments such as more government expenditures, income, trade openness, financial openness, high institutional quality, and low inflation. Since macro-economic stability is essential to regularize the economic activities, researchers prioritize it while providing policy recommendations to mitigate the detrimental effect of financial crises (Bourguignon, 2020). However, sustaining financial system through stable macroeconomic environment requires efficient government policies and high institutional quality (Agyemang et al., 2018; Cherif & Dreger, 2016) which may facilitate financial markets through foreign direct investment (Otchere, Soumaré, & Yourougou, 2016), innovation capacity (Pradhan et al., 2016) and human capital (Ibrahim & Sare, 2018).

The transparent and proactive behavior of government, especially toward creditdependent sectors, to improve the institutional financial environment (Shahbaz, Bhattacharya, & Mahalik, 2018). More significant information disclosure in government legislation and policies can facilitate investors' decision-making behavior and promote financial liberalization. Regulatory reforms with more transparency mitigate the underpricing of securities and ventures, which promote financial market development (Huang

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et al., 2019). By applying the GMM model on global-level panel data, Montes, Bastos, and de Oliveira (2019) argued that fiscal transparency improves government accountability and reduces the likelihood of resource misallocation. Similar results were purported by De Simone et al. (2019) using random-effects panel regression. Although any empirical link is not developed in prior literature (as far as we know) on the relationship between government transparency and financial market development, we posited that transparency curb corruption, mitigate adverse selection (Klein, Lambertz, & Stahl, 2016) and improve the efficiency of resource allocation (Montes et al., 2019) which consequently enhance the sustainability of financial systems.

Besides government transparency, the effectiveness of an anti-monopoly policy boosts confidence in the business environment and allows open market competition. Generally, monopolists reduce production, charge excessively, and waste resources through excessive staff and higher remuneration. Powerful monopolistic business lobbies may interfere with government policy-making efforts to hinder effective competition and regulatory policies (Qaqaya & Lipimile, 2008). Similarly, monopsony behavior reduces the value of financial sector equity (Roberts, 2017), shift risks to sellers, and force prices below a longterm market rate (Noll, 2004). On the other hand, competition among financial institutions increases the availability of financial services and reduces the cost of finance. Therefore, anti-monopoly policies and a higher degree of competition facilitate the inclusiveness of financial sectors (Owen & Pereira, 2018). Consistent with this argument, Asongu, Nwachukwu, and Tchamyou (2016) argued that competition and information sharing curtail corruption in lending, which leads to improvement in the financial market. In the same lines, Kasman and Carvallo (2014) estimated the role of competition in the Latin American and Caribbean banking sector using the Granger causality technique in dynamic panel models. They revealed that a certain level of competition is conducive to greater banking efficiency and financial stability; however, fragility and inefficiency may occur with the increase in complexity and size. Consistent with Kasman and Carvallo (2014), we also believe that a higher level of market power leads to a less efficient financial sector as the pressure to increase efficiency is absent. Effective antimonopoly policies by the government may improve efficiency and control adverse selection issues simultaneously by setting the market competitiveness at an optimal level.

We are interested in examining both short-run and long-run relationships among underlying variables. Grounded from previous literature on transparency and corruption, we posit that bureaucratic powers try to intervene when governments move from authoritarianism to accountability, causing economic and financial instability (Rodan, 2004) in the short-run. Nevertheless, adequate implementation of the transparency policies in the presence of government effectiveness may combat corruption and restrict democratic retrenchment in the long-run that improves the sustainability of financial systems. Correspondingly, competition improves financial markets to a certain level, but when the excessive risk-taking starts gaining momentum, adverse selection and information asymmetry may lead to financial instability and fragility in the long-run (Álvarez & Bertin, 2016; Owen & Pereira, 2018). Additionally, macroeconomic stability may facilitate transparency and anti-monopoly policies in both the short and long-run. It should be noted that although we have considered macro-level factors, some debate is derived from micro-level units. Lippi (1988) suggested that the equality of the cointegrating vectors at the micro-level is the only plausible condition for cointegration. However, Gonzalo (1993) explored the conditions under which certain kind of heterogeneity among agents is allowed, and those conditions are satisfied by dynamic panel data models.

3. Data and methodology

3.1. Data

A panel dataset comprised 113 countries¹ over the period 2007 to 2017 was developed after excluding the countries with missing data. To estimate a further holistic view of the short-term and long-term effect of macroeconomic stability, governments' transparent policies, and effective anti-monopoly policies on financial market development, we divide the main panel into three subpanels based on income level, i.e., high income, middle income, and low-income countries. The data of financial market development, macroeconomic stability, transparency in government policies, and the effectiveness of anti-monopoly policy is retrieved from the global competitiveness index (GCI).² The global competitiveness report (GCR) is an annual report published by the World Economic Forum.

According to Alomari, Marashdeh, and Bashayreh (2019), financial market development is defined as the improvement in the market intermediation and financial markets in general that can be driven by several factors, policies, and the institutions. Essentially, the ultimate goal of financial market development is to stimulate economic growth and reduce poverty. Financial market development is considered as the dependent variable of this study and the eight pillar of efficiency-driven economics which is measured by the affordability of financial services, regulation of securities exchanges, soundness of banks, venture capital availability, ease of access to loans, financing through local equity market, availability of financial services and legal rights. The stable macroeconomic framework is the third pillar of factor-driven economies in which the GCI report compiles five components (government budget balance, gross national savings, inflation, government debt, and country credit rating) to assess macroeconomic stability of a country. Transparency in government policies³ is measured by the degree of accessibility of information for businesses regarding the modifications in government regulations and

¹The sample countries used in the study include Albania, United Arab Emirates, Argentina, Armenia, Australia, Austria, Azerbaijan, Burundi, Belgium, Bangladesh, Bulgaria, Bahrain, Brazil, Botswana, Canada, Switzerland, Chile, China, Cameroon, Colombia, Costa Rica, Cyprus, Czech Republic, Germany, Denmark, Dominican Republic, Algeria, Egypt, Spain, Estonia, Ethiopia, Finland, France, United Kingdom, Georgia, Gambia, Greece, Guatemala, Hong Kong, Honduras, Croatia, Hungary, Indonesia, India, Ireland, Iceland, Israel, Italy, Jamaica, Jordan, Japan, Kazakhstan, Kenya, Kyrgyz Republic, Cambodia, South Korea, Kuwait, Sri Lanka, Lesotho, Lithuania, Luxembourg, Latvia, Morocco, Madagascar, Mexico, Mali, Malta, Montenegro, Mongolia, Mozambique, Mauritania, Mauritius, Malaysia, Namibia, Nigeria, Nicaragua, Netherlands, Norway, Nepal, New Zealand, Oman, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Paraguay, Qatar, Romania, Russia, Saudi Arabia, Senegal, Singapore, El Salvador, Serbia, Slovak Republic, Slovenia, Sweden, Chad, Thailand, Trinidad and Tobago, Turkey, Tanzania, Uganda, Ukraine, Uruguay, United States, Venezuela, Vietnam, South Africa, Zambia and Zimbabwe.

²The index incorporates the microeconomic and macroeconomic aspects of competitiveness in a single index. It can be further conceptualize that how constructively an economy utilize its available resources to improve the prosperity of their citizens.

³GCI measured transparency of government policy making using 7-point scale, i.e. 1 = extremely difficult; 7 = extremely easy. Similarly, the scale points for effectiveness of anti-monopoly policy ranges from 1 = does not promote competition to 7 = effectively promotes competition.

guidelines. In contrast, the extent to which anti-monopoly policy promotes competition is considered to measure the effectiveness of anti-monopoly policies.

We consider real per Capita GDP, trade openness (TOP), and market size (MSIZE) as control variables in the study. Natural log of real per capita GDP and the natural log of trade openness (imports plus exports as a percentage of GDP) retrieved from World Development Indicators online database are incorporated in the empirical model. Market size defines the capacity of potential sellers and buyers in both the foreign and domestic market segments. The data of market size is also derived from GCI, which is the tenth pillar of efficiency-driven economies. Table 1 shows the summary statistics of all variables used in the study.

We consider values/scores rather than ranks as continuous data has an advantage over discrete data. Since continuous data possess high sensitivity and inferences can be made with a finite sample size, a variety of analysis options are available. Furthermore, we can retrieve normally distributed data using values with lower standard deviation from GCI. Results in Table 1 show that the average financial market development scores are 4.17, with the lowest scores of Burundi and the highest score of the United Kingdom. Additionally, Zimbabwe has the most unstable macroeconomic environment, and Norway has the highest macroeconomic stability. Transparency and effective antimonopolies of Venezuela is ranked lowest by the GCI; however, Singapore has the most efficient transparent government policies, and Germany is most effective in terms of anti-monopoly policies.

3.2. Methodology

Especially in the presence of non-stationary data, panel static techniques including pooled OLS, random-effects, and fixed-effects models are not appropriate. Although the GMM estimator is a powerful technique to deal with endogeneity issues in the panel dataset, it is more suitable for micro panel datasets (Eberhardt, 2012). In the case of macro panel datasets, the validity of the Sargan test of over-identification restriction is affected as the increase in the period also increases the number of instruments (Roodman, 2009). Secondly, if the slope coefficients are not identical, GMM estimations may provide misleading and inconsistent coefficients (Pesaran, 1997; Pesaran & Shin, 1999; Pesaran & Smith, 1995). Thirdly, Pesaran and Smith (1995) identified that IV estimations used by GMM might fail to yield a valid set of instruments when all variables that are correlated with lagged dependent variables and independent variables will also be correlated with composite disturbances. The fixed-effects estimations with common slopes can provide biased estimates which cannot be corrected with GMM; therefore,

Tuble 1. Summary statistics.				
Variable	Mean	S.D.	Min	Max
Financial Market Development	4.17	0.75	2.13	6.23
Macroeconomic Stability	4.76	0.90	1.02	6.84
Transparent Government Policies	4.24	0.78	1.76	6.34
Effective Anti-monopoly Policies	4.02	0.79	2.21	6.12
GDP	7.83	1.69	5.26	11.63
Trade Openness	4.56	0.53	3.71	7.68
Market Size	3.91	1.13	1.25	7.00

Table 1. Summary statistics.

PMG estimator developed by Pesaran et al. (1999) is a useful intermediate alternative that allows all error variances and coefficients to differ across the groups.

Thus, we consider a panel autoregressive distributive lag model (ARDL) to unravel the short-term and long-term effects. An autoregressive model of order q in the explanatory factors and an autoregressive model of order p in the dependent variable is considered. Further model specification of ARDL is given in equation 1:

$$\ln \text{FMD}_{it} = \sum_{j=1}^{p} \lambda_{ij} \ln \text{FMD}_{i,t-j} + \sum_{j=1}^{q} \delta_{ij} X_{i,t-j} + \mu_i + \varepsilon_{it}$$
(1)

where FMD is the financial market development, X_{it} is $(k \times 1)$ vector of explanatory variables including macroeconomic stability (MES), transparency in government policies (TGP), the effectiveness of anti-monopoly policy (EAP) and their interactions, μ_i represents the fixed-effects, λ_{ij} is the coefficient of the lagged dependent variable, δ_{ij} is $(k \times 1)$ coefficient vector of independent variables, ε_{it} is the error term, i (1, 2, ..., N) is the number of cross-section, and t (1, 2, ..., T) denotes the time. An error-corrected form of the re-parameterized model is given in equation 2:

$$\Delta \ln FMD_{it} = \theta_i \ln FMD_{i,t} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta \ln FMD_{i,t-j} + \sum_{j=1}^{q-1} \delta_{ij} \Delta X_{i,t-j} + \mu_i + \varepsilon_{it}$$
(2)

where, $\ln FMD_{i,t} = \phi_i \ln FMD_{i,t-1} - \beta'_i X_{ib} \theta$ indicates the long-run coefficients, while λ represents the short-term coefficients of the lagged dependent variable and δ is the short-term coefficient of the lagged independent variables. Additionally, ϕ_i denotes the error-correction term coefficient to evaluate the speed of adjustment of financial market development toward its long-run equilibrium with the variation in explanatory variables. The long-run coefficients and the speed of adjustment are the fundamental interests of our analysis. If the errorcorrection term is equal to or greater than zero, then the long-run stability among variables is not evident. The positive absolute value of ϕ_i represents that there is no long-run relationship because any departure from equilibrium will not correct itself, but the negative value of ϕ_i represents cointegration between the independent and dependent variables.

To comply with our theoretical propositions and improve the statistical interference, we utilize the pool mean group (PMG) estimator to pool coefficients of long-run variables. In the meantime, we allow country-specific characteristics in short-run estimations to control for omitted variable bias. We also use mean group (MG) analysis to estimate the variation of countries in both the intercepts and slopes. The appropriateness of the PMG estimator and the validity of the cross-sectional, long-run homogeneity restriction of the form $\theta_i = \theta$ (i = 1, 2, ..., N) are tested using a Hausman-type statistic. The PMG estimator provides more robust outcomes when the estimations yield long-run homogeneity restriction (Pesaran et al., 1999).

Researchers argue that the same order of integration is necessary for the long-run relationship among variables (Phillips & Hansen, 1990). For instance, bound testing and VECM are also efficient techniques for cointegration relationship, but they assume variables to be in the same order of integration (Pesaran, Shin, & Smith, 2001). However, panel ARDL-PMG can be utilized irrespective of integration orders due to which the stringent assumptions of stationary data or unit root tests are evitable. Standard ARDL models also allow some degree of endogeneity among variables. The

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model also maintains the asymptotic distribution of the estimators of the long-run coefficients and mitigates the endogeneity bias if the lagged variables are adequately assessed. Modeling the ARDL with appropriate lags may minimize the issue of endogeneity and serial correlation. Particularly in the case of our model, the causal relationship between macroeconomic stability and financial market development cannot be ascertained beforehand. ARDL also allows for heterogeneity in the slopes. We apply Pesaran and Yamagata (2008) homogeneity tests to evaluate cross-country heterogeneity.

4. Results and discussion

The panel ARDL is a convenient tool that can be utilized with the variables with a different order of integration. Although unit root testing is not a strict assumption, we perform the LLC, IPS, and Autoregressive Distributed Lag (ADL) to set the stationary of data as PMG estimation in the ARDL approach cannot be applied to I(2) or higher series.⁴ Table 2 shows that all variables except trade openness fall in stationary I(0) series, signifying that all time-series in our model are either I(0) or I(1) processes. Furthermore, the significant test statistics.

The statistics of Pesaran and Yamagata (2008) homogeneity tests show significant values for all delta and adjusted delta except effective anti-monopoly policies, and these results confirm cross-country heterogeneity. After ensuring the non-stationary nature of time-series, we perform panel co-integration tests. As shown in Table 3, the significant values at the 1% level indicate consistent evidence of co-integration in the data.

We apply MG and PMG estimators, to evaluate the short-term and long-term effects of macroeconomic stability on financial market development along with the moderating role of government policies (transparency and anti-monopoly policy). Based on the Schwartz Bayesian Criterion, the maximum lag of one⁵ is chosen. Table 4 shows that error-correction estimates are negative and lies within the unit circle (between -1 and 0) which identified

	L	LC	IPS		ADF		Slope Homogeneity	
Variable	Level	FD	Level	FD	Level	FD	Â	$\hat{\Delta}_{adj}$
FMD	5.22	-6.29***	1.63	-4.67***	-0.31	3.47***	4.537***	5.112***
MES	7.48	-12.93***	2.87	-6.93***	-0.06	2.04**	2.228***	3.439***
TGP	3.92	-4.04***	4.82	-2.66***	0.28	4.23***	4.793***	4.805***
EAP	2.95	-3.45***	1.72	-3.65***	1.94	8.33**	0.901	1.097
GDP	4.72	-13.77***	-1.93	-2.94***	1.05	4.34***	5.141***	5.305***
TRO	-9.66***		-2.04		-5.86***		3.913***	4.126***
MSIZE	13.53	-11.04***	10.78	3.76***	4.28	8.95***	4.374***	4.812***

Table 2. Panel unit roots tests.

Note: FD = First Difference, FMD = Financial Market Development, MES = Macroeconomic Stability, TGP = Transparency in Government Policies, EAP = Effectiveness of Anti-Monopoly Policies, GDP = Gross Domestic Product, TRO = Trade Openness, MSIZE = Market Size. All variables are in natural logarithms and the asterisks *** and ** denote a significance of 1% and 5%, respectively.

⁴The unit root shows random walk with drift in a time-series. The presence of unit root may produce spurious regression estimates and misleading results. The first panel unit root test used in the study is developed by Levin, Lin, and Chu (2002). LLC is preferred for pooled data if the number of cross-sections are between 10 to 25 and the time period ranged from 5 to 250. On the other hand, the panel unit root test of Im, Pesaran, and Shin (2003) assume normal distribution of variables with zero mean and finite heterogeneous variance. Lastly, using the idea of Fisher (1992), Fisher-ADP test demonstrated by Maddala and Wu (1999) is used.

⁵Taking a one lag (dependent variable) is also justified by numerous studies used GMM estimator.

Tal	ble	3.	Panel	co-integration tests.	
				1	

Pedroni test Stats.	Panel	Group
v-Statistic	-5.131***	
Rho-Statistic	3.091***	6.164***
t-Statistic	-13.46***	-14.012***
ADF-Statistic	-7.823***	-7.364***

Note: **** indicates rejection of the null hypothesis of no cointegration at the 1% significance levels.

Table 4. Results of PMG and MG.

	(1) PMG	(2) MG	(3) PMG	(4) MG
Long-run Coefficients				
Macroeconomic Stability	0.629*** (0.025)	1.028** (0.902)	0.515*** (0.028)	0.926** (0.818)
Transparent Government Policies	0.012** (0.097)	0.171* (0.801)	0.015** (0.089)	0.098** (0.624)
Effective Anti-Monopoly Policies	-0.391** (0.293)	-0.778** (2.273)	-0.284** (0.170)	-0.702* (2.043)
MESTGP			0.013* (1.025)	0.029 (1.400)
MESEAT			0.002 (2.652)	0.007 (1.843)
GDP	0.039 (0.036)	0.260 (0.115)	0.055 (0.029)	0.238 (0.096)
Trade Openness	0.031*** (0.022)	0.067** (0.147)	0.075*** (0.019)	0.071** (0.098)
Market Size	0.908 (0.108)	1.005 (0.148)	0.840 (0.096)	0.967 (0.182)
Speed of Adjustment	-0.338*** (0.073)	-0.648** (0.037)	-0.329*** (0.055)	-0.609*** (0.143)
Short-run Coefficients				
∆ Macroeconomic Stability	0.213** (0.110)	0.225** (0.039)	0.201** (0.093)	0.207** (0.052)
∆ Transparent Government Policies	0.067 (0.054)	0.154 (0.680)	0.087 (0.021)	0.287 (0.013)
∆ Effective Anti-Monopoly Policies	0.159* (0.094)	0.067** (0.017)	0.258* (0.082)	-0.279* (0.077)
Δ MESTGP			0.249 (0.094)	0.415 (0.505)
Δ MESEAT			0.085*** (0.106)	0.024** (0.097)
Δ GDP	0.025 (0.954)	0.408 (0.206)	0.046 (0.225)	0.126 (0.127)
∆ Trade Openness	0.019 (0.024)	0.058 (0.126)	0.062 (0.148)	0.082 (0.193)
∆ Market Size	0.017 (0.624)	0.075* (0.856)	0.047 (0.148)	0.003 (0.104)
Country Effects	Yes	Yes	Yes	Yes
Country-Specific Time Dummies	Yes	Yes	Yes	Yes
Intercept	1.401** (0.154)	1.018*** (0.089)	2.961*** (0.822)	2.137*** (0.604)
Hausman Test	0.428 (0.795)		0.360 (0.996)	

Note: MESTGP = Interaction of macroeconomic stability with transparent government policies, MESEAT = Interaction of macroeconomic stability with effective anti-monopoly policies. The asterisks ***, **, and * denote a significance of 1%, 5%, and 10%, respectively. Standard errors are in parentheses.

dynamic stability (long-term relationship) and the presence of co-integration between FMD and its explanatory variables. The lower value of ϕ (-0.338) suggests greater adjustment inertia and deviation from long-term equilibrium is corrected by almost 33.8% in a year. The probability of long-run coefficients cannot be ignored after analyzing the Hausman test. Therefore, PMG is considered a more powerful tool for our panel data compared to the MG estimator.

Results also show that macroeconomic stability positively and significantly influences financial market development in both the long-run and short-run at 1% and 5% level, respectively. Although there is little understanding of how a composite measure of stable macroeconomic environment (stable government budget balance, gross national savings, inflation, government debt, and country credit rating) improves the development of financial markets, our results can be compared with similar studies (Aluko & Ibrahim, 2020; Cherif & Dreger, 2016; Kim & Wu, 2008). On the other hand, we find the positive and significant effect of transparency in government policies on financial market development in the long-run only. According to Michener (2019), transparency policies restrict

democratic retrenchment and combat corruption but these transparency policies might not achieve their desired effects due to lapses of implementation and compliance. In contrast, fiscal transparency enhances government effectiveness and spending efficiency (Montes et al., 2019) which fosters the financial infrastructure, the functioning of financial markets, and stable macroeconomic activities in the long-run (Arora, 2017; Le, Kim, & Lee, 2016).

Interesting evidence is found concerning the effectiveness of anti-monopoly policies. Consistent with the traditional market view, we find a significant and positive effect of effective anti-monopoly policies on financial market development in the short-run at the 10% level. It is argued that competition increases the financial service availability and financial stability by reducing the cost of finance and credit risk (Berger & Hannan, 1998; Noman et al., 2018; Pham, Nguyen, & Nguyen, 2019; Phan, Daly, & Akhter, 2016). Lack of competition undermines the growth and development of financial dependent industries (Khan et al., 2018). Conversely, the significant but negative effect in the long-run shows that the higher degree of competition may decrease credit availability and stimulate financial constraints due to adverse selection issues and restrictive banks' incentives to build lending relationships (Álvarez & Bertin, 2016; Owen & Pereira, 2018).

In models 3 and 4, the interaction terms of effective anti-monopoly policies and transparency of government policies with macro-economic stability are incorporated along with other explanatory variables. The results show that transparent government policies strengthen the link between macroeconomic stability and financial market development in the long-run only. Although transparency is a strong instrument for good governance, civic engagement, fiscal sustainability, and facilitates a hospitable environment for entrepreneurs through greater access to financial resources (Sumanjeet, 2015), the complexity in transparency policies such as budget constraints, task complexity, and legal-normative constraints (Ingrams, 2017) make them difficult to be adjusted with the stable macroeconomic environment in the short-run. Thus, the combined effect of macroeconomic stability and transparent government policies on financial market development is evident in the long-run.

In contrast, we find that the interaction of effective anti-monopoly policies and macroeconomic stability has a positive effect on financial market development in the short-run only. However, this positive effect is attenuated over time due to the smaller coefficient in the long-run. The estimates hold the traditional market view in the short-run that a higher degree of competition supports macroeconomic stability to improve financial markets and institutions. Nonetheless, competition increases the information asymmetry and imposes restrictions on industrial stakeholders in the long-run which restricts their ability to facilitate a stable macroeconomic environment leading to less effective financing availability. Last but not the least, there is no empirical evidence regarding the effect of GDP and market size on both the short-run and long-run. However, the results show that trade openness has an impact on financial market development in the long-run. Trade openness boosts the demand for external finance and financial depth which expedite the process of financial market development in the long-run (Le et al., 2016).

	(5) Low-income	(6) Middle-income	(7) High-income
Long-run Coefficients			
Macroeconomic Stability	0.552*** (0.109)	0.480*** (0.093)	0.351**
,			(0.032)
Transparent Government Policies	0.012	0.038*	0.031**
•	(0.095)	(0.103)	(0.084)
Effective Anti-Monopoly Policies	0.234**	-0.028** (0.218)	-0.592*
. ,	(0.313)		(1.914)
MESTGP	0.002	0.014*	0.052**
	(0.922)	(0.229)	(0.867)
MESEAT	0.048*	-0.002	-0.007
	(2.791)	(2.652)	(1.843)
GDP	0.148	0.045	0.019
	(0.165)	(0.127)	(0.002)
Trade Openness	-0.009** (1.357)	0.008*	0.071*
		(0.117)	(0.092)
Market Size	1.276	0.858	0.037
	(0.073)	(0.036)	(0.139)
Speed of Adjustment	-0.092*** (0.104)	-0.203*** (0.092)	-0.517*** (0.182)
Short-run Coefficients			
∆ Macroeconomic Stability	1.032**	0.912**	0.719**
	(0.119)	(0.098)	(0.004)
∆ Transparent Government Policies	0.003	0.370	0.136
	(2.094)	(1.383)	(0.512)
∆ Effective Anti-Monopoly Policies	0.125*	0.068*	-0.160*
	(1.392)	(0.108)	(0.036)
Δ MESTGP	0.449	0.155	0.118
	(0.005)	(0.148)	(0.913)
Δ MESEAT	0.048	0.739**	0.240*** (0.138)
	(0.121)	(0.096)	
Δ GDP	0.157	0.667	0.065
	(1.562)	(0.052)	(0.102)
∆ Trade Openness	-0.048 (0.106)**	0.021	0.183
		(0.089)	(0.193)
∆ Market Size	0.119	0.073	0.035
	(0.522)	(0.084)	(0.149)
Country Effects	Yes	Yes	Yes
Intercept	4.205	2.217 (0.828)***	1.939 (0.512)***
	(0.092)**		
Hausman Test	0.511	0.314	0.619
	(0.922)	(0.899)	(0.993)

Table 5. Results of PMG for sub-panels.

5. Robustness checks

We divided our global panel into three sub-panels based on income level to perform robustness checks (see Table 5). Slightly different estimates were generated by PMG for low-income, middle-income, and high-income countries. In both short-term and longterm, macroeconomic stability has a positive significant impact on financial market development in all panels, however, transparent government policies show no significant effect in low-income countries. Furthermore, an anti-monopoly policy facilitates the financial market development of low-income countries positively in both the short-run and long-run. Lastly, we find that trade openness lowers the efficiency of financial institutions in low-income countries in both the short-run and long-run. The rest of the sub-panel results are consistent with the global panel.

6. Conclusion and policy implications

Financial market development is an essential source of economic growth and sustainable development. However, the growth of the financial sector is determined by several macroeconomic, political, and institutional factors that should be taken under consideration to design and implement a perceptive policy. Although the literature on financial market development is more responsive toward institutional and governance facets, little empirical evidence underpins the link of macroeconomic stability, transparency policies, anti-monopoly policies, and their interaction with financial market development.

Our study focuses on filling certain gaps in the existing literature. Particularly, panel ARDL-PMG estimator was applied to a large panel data comprised 113 countries. For robustness checks, the sample was further divided into developing and developed countries. The main findings of the study exhibit the prominent role of macroeconomic stability for fostering financial market development in both the short-run and long-run. Although the immediate effect of implementing transparent government policies is not evident, it is an effective mechanism to improve financial markets in the long-run and strengthen the link between macroeconomic stability and financial market development. On the other hand, anti-monopoly policies may facilitate the connection between a stable macroeconomic environment and financial market growth for a short time horizon and but their positive impact may not get adjusted in the long-run equilibrium.

Our findings provide significant policy implications for both developing and developed countries. Firstly, the stable macroeconomic environment should be sustained as it is important to promote the growth of financial markets by curbing interest and currency fluctuation regardless of the economic development of a country. Thus, controlling unmanaged inflation, large debt burden, and excessive currency volatility are essential for the stable functioning of the financial market in both developing and developed countries. Secondly, more information related to government policies should be provided to investors and businesses for building their trust and confidence in financial markets.

Generally, government policies are opaque in developing countries and the public awareness toward their transparency is not well-established due to which their role in fostering financial sector development is less dynamic in these markets. Thus, a higher degree of government transparency is needed in developing countries for improving both macroeconomic stability and financial development. Lastly, the developing countries may develop their financial markets through anti-monopoly policies by curbing corruption and bureaucratic power but a more sophisticated and optimum anti-monopoly policy should be designed for developed countries to mitigate the issue of information asymmetry.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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