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The Influence of Public Spending on Private Investment in Developing Economies: Does Institutional Quality Matter?[1]

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The role of institutional quality in the relationship between public spending and private investment is a controversial theme because institutional quality can mitigate the crowding-out impact of government expenditure on the private sector's investment. Does institutional quality contribute to public spending – private investment nexus in developing countries? This paper provides the answer by studying the role of governance quality in government spending – private investment nexus for a panel dataset of 98 developing countries over the period 2002–2020. It uses the system/difference GMM estimators for robustness checks and estimation. The empirical results seem counter-intuitive. Institutional quality and public spending increase private investment, while interaction decreases. The paper looks at some arguments to explain and suggests policy implications to improve institutional quality and enhance private investment.

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1. Introduction

One of the crucial instruments in the effective management of an economy is public spending. In addition to tax policy, fiscal policy plays an active role in economic development and growth as it helps the government deal with the cyclicality of the economy. Governments cut spending for a fast-growing economy with a high inflation rate (i.e., contractionary policy on the side of decreased spending). By contrast, they increase it for a recessed economy with a high level of unemployment rate (i.e., expansionary policy on the side of increased spending). Meanwhile, the private sector creates dynamic economic activities for the economy. It represents its importance in the growth models as it provides most jobs, and its investment mainly contributes to economic growth. Despite the significant contributions of the private and public sectors to economic activities, the influence of public spending/expenditure on private capital spending is still one of the controversial themes among economists and policymakers. This effect in some related studies is complementary, while that in others is substitutionary. Notably, institutional quality is a fundamental engine of economic growth and development [Acemoglu et al., 2005]. Li & Filer (2007) note that the impact of institutional settings on investment investors' behavior is set up through the institutional mechanism of business activities. Therefore, institutional quality may play a crucial role in government expenditure/spending – private investment nexus. However, no existing studies examine its role in this relationship. Does institutional quality affect this relationship in developing economies? This paper looks for the answer to contribute academically to the literature.

Regarding the relevance, Wang (2005) shows that the arguments by the neoclassical schools and the Keynesian thought demonstrate the mechanisms through which public spending differently affects private investment. The Keynesian lines note that increasing government spending mainly financed by borrowing leads to high interest rates in financial markets. Because of this, private investment will be decreased (the crowding-out hypothesis). By contrast, the view by the principle of accelerator suggests that public spending promotes economic growth (GDP per capita), which, in turn, stimulates the private sector's investment as the private sector will invest more due to high savings from high-income (the crowding-in hypothesis) [Barro, 1974; Kormendi, 1983]. Meanwhile, the neoclassical views focus on the complementary or substitutionary nexus between public spending/expenditure and the private sector's investment. Government spending on human capital and infrastructure promotes the marginal productivity of the private sector's capital, which enhances private investment (complementarity hypothesis). By contrast, public spending on investment capital stimulates the capital accumulation rate higher than the optimal level, which makes the private sector decrease their investment to set up the optimal capital accumulation rate in the economy (the substitutability hypothesis). Notably, several economies with bad institutional quality often design, issue, and pursue arbitrarily and non-transparently policies and regulations. The policies on government spending regulate and control interest rates on loans and deposits of banks. Hence, government spending through loans will not take over available funds for the private sector, which, by contrast, promotes the private sector's investment due to low levels of interest rates. Based on these arguments, institutional quality in developing economies fosters private investment and establishes a complementary relationship between the public and private sectors. Then why does the interaction between public spending and institutional quality impede private investment? Poor institutional quality leads to rent-seeking and corruption of public officials in public spending projects. The institutional im-

provement is to control and limit rent-seeking and corruption, which leads to a decline in public spending, especially in public projects financed by borrowing. Therefore, an interaction between government spending and institutional quality reduces private investment.

An official work by Ortiz-Ospina & Roser (2016) notes that government spending is heterogeneous among regions worldwide. Advanced countries, especially European ones, manage and control a larger ratio of public expenditure to GDP than developing countries. For instance, the public spending ratio in France accounts for over 50%, while this ratio in Nigeria captures nearly 6%. More importantly, developed economies use more resources than developing economies, both per capita and as a ratio to GDP. Developed economies have a much higher percentage of social spending in total expenses than developing economies, particularly in social transfers. In particular, advanced economies specifically devote a large ratio of public spending to GDP for transfers. Low-income sub-Saharan African economies have a much lower ratio of government spending to GDP for social transfers to support the poor social groups, which plays a less meaningful role. Worldwide governments often look at the importance of the private sector in managing and producing services and goods. Procurement in the public sector is a legal procedure through which central and local governments purchase works, services, and goods from companies. In advanced countries, the private sector's supplies for government purchases are considered significant. For example, public procurement in the Netherlands makes up nearly 45% of total government expenditure, at 20% of GDP. Public procurement in Greece accounts for approximately 20% of public spending, but its size is significant at 10% GDP.

In summary, public spending can affect (increase or decrease) private investments, and institutional quality may influence public expenditures – private investment nexus. Given these facts, this paper studies the influences of public spending, governance quality, and their interaction on private investment for the panel dataset of 98 developing economies between 2002 and 2020. It employs the difference/system GMM (Generalized Method of Moments) estimators for robustness check and estimation.

The paper describes its structure in the following way. Section 1 shows a theoretical framework. Section 2 reports the literature which notes the influence of public expenditure/spending on private investment. Meanwhile, Section 3 provides the empirical model and research data, and Section 4 reports the estimated results along with a discussion. Section 5 is the final one with a conclusion and some implications.

2. Literature Review

Although the research topic is mentioned quite early, the number of studies on the public spending – private investment nexus is not available in abundance. Several studies report that this relationship is substitutionary, while some note it is complementary. Besides, a few studies suggest mixed results.

Regarding the substitutionary relationship, Kim & Nguyen (2020), Şen & Kaya (2014), Furceri & Sousa (2011), and Argimon et al. (1997) report that public spending decreases the private sector's investment. Accordingly, Argimon et al. (1997) employed fixed effects models, random effects models, and instrumental variable regression in fourteen OECD economies between 1979 and 1988. Meanwhile, Furceri & Sousa (2011) used a pooled OLS regression, random effects models, fixed effects models, and one-step GMM Arellano – Bond estimator from 1960 to 2007 for 145 countries. In the same vein, Şen & Kaya (2014) applied a VECM model for Turkey between

1975 and 2011, while Sinevičienė (2015) used the Granger causality tests for Bulgaria, Estonia, Lithuania, Latvia, and Slovenia between 1996 and 2012. Besides, Kim & Nguyen (2020) manipulate a first-stage regression to the time series of the United States during the period 1980–2008, whereas Mwakalila (2020) employs the Autoregressive Distributed Lag model for a time series dataset of Tanzania (from 2004Q1 to 2018Q4). Recent research by Bedhiye & Singh (2021) applied the ARDL (Autoregressive Distributed Lag) model for Ethiopia from 1984 to 2019. All such studies conclude that government spending causes domestic enterprises not to receive more investment opportunities. These studies suggest that the efficient distribution of government spending will maximize its potential benefits.

Regarding the complementary relationship, Idowu et al. (2020) and Omitogun (2018) note that government spending in Nigeria increased the private sector's investment for the same research time from 1981 through 2016 and the same methodology. Omitogun (2018) recommends that governments think of the crucial role of the private sector in public expenditure projects, while Idowu et al. (2020) suggest that policymakers should promote government capital expenditure. Similarly, Marattin & Salotti (2011) apply a panel VAR model for panel data of 14 EU economies from 1970 through 2006.

Regarding mixed results, Wang (2005) employs a VECM model for a time series dataset of Canada between 1961 and 2000. He discovers that public spending on health and education increases the private sector's investment, but public spending on infrastructure and investment capital reduces it. In addition, Ahmed & Qayyum (2007) use a VECM model for a time series dataset of Pakistan from 1980 to 2002. He reports that government investment crowds in the private sector's investment, while government current expenditure crowds out it.

Unlike the above studies, Wu & Zhang (2009) use an ECM model for a time series dataset of China from 1978 to 2004. They note that public capital expenditure increases the private sector's investment in the long run and decreases in the short run. In particular, public consumption and transfer expenditure do not affect the private sector's investment much. However, Akinlo & Oyeleke (2018) didn't find the influence of public spending on private investment by applying a VECM model for a time series dataset of Nigeria from 1980 to 2016. In particular, some papers use public spending as the variable of interest in the empirical models [Gnangoin et al., 2019; Oseni et al., 2020]. Besides, they apply the difference and system GMM estimators for estimation.

From the literature review, no existing papers introduce institutional quality/governance into the public spending – private investment nexus. Notably, no papers consider this issue for the large group of developing countries. This paper will focus on this issue as a little contribution to the literature. Therefore, the hypotheses are expressed as follows:

(1) H1: Public spending positively affects private investment for a group of developing countries from 2002 to 2020.

(2) H2: Institutional quality/governance positively affects private investment for a group of developing countries from 2002 to 2020.

(3) H3: Interaction between public spending and institutional quality positively affects private investment for a group of developing countries from 2002 to 2020.

3. Empirical Model and Research Data

3.1. Empirical model

From Şen & Kaya (2014), this paper presents the empirical model as follows:

$$(1) \qquad PIN_{it} = \tau_0 + \tau_1 PIN_{it-1} + \tau_2 SPE_{it} + \tau_3 INS_{it} + \tau_4 \left(SPE \cdot INS \right)_{it} + Y_{it} \tau' + \sigma_i + \Psi_{it},$$

where subscript t denotes the time index, while subscript i presents the country index. PIN_{it} is gross fixed capital formation (% GDP), a proxy for the private sector's investment, PIN_{it-1} is the initial investment level of the private sector, SPE_{it} is public spending, INS_{it} is one of the six dimensions of governance, a proxy for institutional quality, and $(SPE \cdot INS)_{it}$ is the interaction between public spending and institutional quality. Y_{it} consists of some control variables such as economic growth, trade openness, and inflation; σ_i is a country-specific, time-invariant, unobserved effect, and ψ_{it} is an error term; τ_0, τ_1, τ_2, τ_3, τ_4, and τ' are estimated parameters. From the related studies in the literature such as Akinlo & Oyeleke (2018), Ahmed & Qayyum (2007), Idowu et al. (2020), Şen & Kaya (2014), and Furceri & Sousa (2011), we use some variables like inflation and economic growth in the empirical equations. Besides, we also introduce trade openness into the empirical models as this variable can enhance the private sector's investment by making the private sector access more capital inflows from other economies. The neoclassical investment framework developed by Jorgenson (1963) argues that the desired amount of capital stock is conditional on output level. The increase in output (economic growth) helps the private sector increase the capital accumulation for investment. In the same vein, Keynes (1936) notes the importance of uncertainty in investment decisions. He argues that the private sector's investment is subject to volatility due to uncertain return to investment. In particular, the economy will have less capital accumulation under a highly uncertain economic environment. Some indicators can be used to capture economic instability, such as stock market volatility, commodity price deviation, inflation, and exchange rate variability. Therefore, economic growth and inflation are crucial factors in the private sector's investment. Notably, trade openness (liberalization) is also a determinant of private investment. A highly integrated economy will set up good conditions for the private sector to receive more investment capital from other economies or international stock markets. Furthermore, The highly open-door policy also encourages the private sector to expand production to export goods to other countries.

According to Feng (2001), Aysan et al. (2007), and Munemo (2012), institutional quality/governance contributes significantly to private sector investment decisions. The six governance indicators are designed based on the opinions of firms and individuals, in particular, to facilitate the development of the private sector [World Bank, 2021]. We show the effects of these indicators on private-sector investment as follows:

(1) Corruption often leads to adverse influences on the economy. It is also a constraint facing companies in developing economies [World Bank, 2021]. Gupta et al. (2002) highlight that corruption boosts income and wealth inequality and poverty in several developing economies. In particular, it enhances the transaction costs of private investors, which leads to a decline in profit and investment.

(2) Government Effectiveness measures the quality of civil services, public services, and policy issues and enforcement, and captures the credibility of commitments by governments to

such policies. It helps governments design, formulate, and implement proper policies in which citizens are centric [Duho, 2020]. Government effectiveness reduces the transaction costs in private sector operations and increases profit, so it promotes private investment.

(3) Political Stability scores the likelihood of politically-motivated violence and political instability [World Bank, 2021]. Political instability leads to uncertainty in the economy and impedes the private sector's investment. In particular, it discourages private investors who are willing to invest in the business and withdraw from previous investment projects.

(4) Regulatory Quality measures the capability of governments to design, formulate, and enforce sound regulations and policies that allow and enhance the development and investment of the private sector [World Bank, 2021].

(5) Rule of Law measures the extent to which enterprises and individuals trust and obey social rules; Notably, it captures the independence and functioning of the judiciary, including contract enforcement quality, property rights protection, the police, the likelihood of violence and crime [World Bank, 2021]. It supports enterprises in economic transactions as well as promotes investment and production in the belief that disputes will be properly adjudicated by the state.

(6) Voice & Accountability is the guarantee of transparency and stability of information and policies built by governments. It holds policy-makers responsible for failures in enforcing regulations and policies. Investment decisions by the private sector are subject to the credibility of these regulations and policies [Aysan et al., 2007]. Open elections and freedom of the press express the citizens' voice in the government's decision-making process. Therefore, Voice & Accountability can increase private investment.

The study uses (1) to examine the influences of public spending, institutional quality, and their interaction on the investment of the private sector for a sample of 98 developing economies. Some severe issues in econometrics stem from estimating (1). The first issue is that economic growth, trade openness, and inflation could be endogenous. In particular, they may correlate with σ_i, which results in endogenous phenomena. The second issue is that some unobserved fixed effects like customs, anthropology, geography, and culture may correlate with some regressors. These effects can exist in σ_i. Besides, a high serial autocorrelation comes from the lagged variable PIN_{it-1}. Finally, the dataset contains a large country unit (M = 98) but a short length of observation (L = 19). These issues can make the OLS regression biased. The REM and FEM do not handle endogenous phenomena and serial autocorrelation. Meanwhile, the IV-2SLS regression requires proper instruments out of all regressors in models. For these reasons, the paper employs the GMM estimators for robustness check and estimation as suggested by Judson & Owen (1999).

The GMM Arellano & Bond (1991) estimators were first proposed by Holtz-Eakin et al. (1988). Two kinds of GMM Arellano-Bond estimators are developed: the difference and the system. The past values of persistent regressors in the empirical models do not provide information for their changes, making their lags become weak instrumental variables in the difference estimation. Therefore, the SGMM (system) is better than the DGMM (difference) [Arellano & Bover, 1995].

The two-step DGMM/SGMM (2DGMM/2SGMM) can be better than the one-step DGMM/SGMM (1DGMM/1SGMM) in efficiency for estimation. However, employing the two-step 2DGMM/2SGMM in small research samples like our sample has a severe issue [Roodman, 2009]. Accordingly, the proliferation in instrumental variables quadratically rises as the time dimension increases, which causes the number of instruments to be larger than the number of countries. The solution is to employ the thumb rule to keep the number of countries more than or equal to the number of instruments [Roodman, 2009]. The paper employs Arellano – Bond, Hansen, and Sargan statis-

tics to test the instruments' validity in the DGMM/SGMM. Hansen and Sargan tests discover endogenous phenomena. Meanwhile, Arellano-Bond tests detect the serial correlation of errors in the first difference. Because of this, the paper ignores the first serial correlation test AR(1), and keeps the second serial correlation test AR(2). Indeed, this paper uses AR(2) to search for the phenomenon of AR(1).

3.2. Research data

The dataset contains gross fixed capital formation, public spending, six dimensions of the governance index, real GDP per capita, inflation, and trade openness. The paper extracts data from World Bank and International Monetary Fund databases. Following the classification of the International Monetary Fund, we use 98 developing countries2 from 2002 to 2020 in the research sample. Appendix (Table 5–9) shows the descriptive statistics and definitions. Table 6 indicates that developing economies have poor institutional quality. It is in line with the arguments by Li & Filer (2007) that developing countries have relation-based governance (bad institutional quality). Table 7 illustrates that trade openness, economic growth, and public spending are positively associated with private investment. Similarly, Table 8 shows that values of the correlation coefficient among governance indicators are very high; therefore, the paper employs them separately. Meanwhile, the stationary tests in Table 9 report that public spending, economic growth, private investment, inflation, trade openness, and six governance dimensions should be significantly stationary at below 5%, meaning these variables have a similar integration of the zero-order I(0).

4. Results and Discussion

4.1. 2SGMM/1SGMM estimates

The paper reports the 2SGMM and 1SGMM estimates in Table 1 and Table 2, respectively. Every column is the empirical model corresponding with one dimension of governance indicators. Inflation is a proxy for macroeconomic instability. An increase in inflation reduces business confidence, impeding private investment. Furthermore, inflation increases transaction costs and lowers profits, which reduces private investment. Private investment, on the contrary, promotes the output of goods and services supplied to the economy, which in turn reduces inflation. Thus, the relationship between private investment and inflation is bidirectional. Indeed, the paper detects

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[2] Angola, Algeria, Argentina, Azerbaijan, Armenia, Bahrain, Bahamas, Barbados, Bangladesh, Benin, Belarus, Bhutan, Belize, Brazil, Bolivia, Burkina Faso, Bulgaria, Burundi, Côte d'Ivoire, Cameroon, Cabo Verde, China, Central Africa, Chile, Chad, Colombia, Comoros, Cambodia, Democratic Republic of the Congo, Costa Rica, Congo Republic, Croatia, Dominican Republic, Egypt, Ecuador, Eswatini, Ethiopia, Equatorial Guinea, Fiji, Gambia, Guinea, Ghana, Georgia, Hungary, Honduras, Iran, India, Jordan, Jamaica, Kuwait, Kazakhstan, Kyrgyz Republic, Kenya, Lesotho, Mali, Malaysia, Mexico, Madagascar, Mauritius, Mongolia, Mauritania, Moldova, Myanmar, Mozambique, Montenegro, Morocco, Namibia, Nepal, Nigeria, Nicaragua, North Macedonia, Niger, Oman, Peru, Philippines, Paraguay, Pakistan, Romania, Poland, Rwanda, Russian Federation, Solomon Islands, Saudi Arabia, Serbia, Senegal, Sri Lanka, Sierra Leone, Thailand, Tajikistan, Tunisia, Togo, Turkey, Uganda, Uzbekistan, Ukraine, Vietnam, Zambia.

that inflation is endogenous in all estimation procedures. Therefore, it uses inflation as an instrumented variable in *gmm* style and public spending, institutional quality, private investment, trade openness, and economic growth as instruments in *iv* style.

The results in Table 1 and Table 2 indicate that public spending and institutional quality increase private investments while interaction crowds out. It is likely to be counter-intuitive. In addition, trade openness, economic growth, and inflation promote private-sector investment. The impacts of public spending and institutional quality on private investment are consistent with stated hypotheses H1 and H2. However, the effect of interaction is contrary to the hypothesis H3.

According to Li & Filer (2007), developing economies have relation-based governance ('bad' governance). These economies often design, issue, and enforce policies and regulations non-transparently and arbitrarily. The policies on public spending regulate and control interest rates on loans and deposits of banks. Because of this, public spending by loans does not compete with the private sector for available funds, which, by contrast, enhances the private sector's investment through low interest rates on loans controlled by governments. Omitogun (2018) and Idowu et al. (2020) report the crowding-in impact of government spending on the private sector's investment in an African country (Nigeria – a developing economy). Aysan et al. (2007) find that governance quality promotes private investment in a group of 31 developing countries in the MENA region. Thus, poor institutional quality in developing economies enhances private investment and establishes a complementary relationship between the public and private sectors. However, it is also the cause of rent-seeking and corruption of public officials in government spending projects. Improvement in institutional settings leads to monitoring and limiting rent-seeking and corruption, which reduces public spending, especially in government projects financed by loans. Therefore, the interaction between public expenditures and institutional quality impedes private investment. Does institutional improvement lead to adverse effects on economic activities in developing economies in the future? We believe that it does not. The development starts at a low level through a cooperative regime between the private and public sectors for coexistence (in developing economies, as in this paper). Over time, however, along with a shift in the governance environment from bad governance (relation-based) to good governance (rule-based), competition between the private sector and public sector for loans (available resources) emerges. This shift will change developing economies with a complementary nexus (public spending – private investment relationship) to advanced economies with a substitutionary nexus. In particular, competition in the market-based economy will result in better use of available resources as shown in the development status in advanced economies that developing economies aim to become.

A rise in inflation increases savings – investments, which supply available loans for the development of the private sector. Idowu et al. (2020) note that inflation promotes private investment in Nigeria. However, due to the adverse effect of inflation on economic activities, governments in developing economies should keep and control price levels. Meanwhile, the open trade policy will facilitate private economic activities like access to international capital markets, exports, and access to foreign inflows. De Mendonça & Brito (2021) show the beneficial contribution of trade openness to private investment in a group of 24 emerging markets. Likewise, economic growth boosts private capital accumulation by retained earnings. Moreover, economic growth encourages businesses to invest and expand production because they sell more goods and earn more profits. Aysan et al. (2007) report a positive contribution from economic growth to private investment in a panel dataset of 31 developing economies in the MENA region, while De Mendonça & Brito (2021) note it in 24 emerging markets.

Table 1.

Institutional quality and public spending – private investment: 2SGMM

Dependent regressor: Private investment

Variables	Regulatory quality	Rule of law	Voice and accoun-tability	Control of corrup-tion	Government effectiveness	Political stability
Private investment (−1)	0.856*** (0.017)	0.847*** (0.017)	0.868*** (0.018)	0.843*** (0.017)	0.851*** (0.018)	0.851*** (0.018)
Public spending	0.025** (0.009)	0.022*** (0.008)	0.010 (0.013)	0.024*** (0.008)	0.023*** (0.009)	0.027*** (0.008)
Institutional quality	1.036*** (0.456)	1.151*** (0.437)	1.211** (0.322)	0.957*** (0.376)	1.123*** (0.361)	1.332*** (0.377)
Public spending × Institutional quality	−0.051*** (0.019)	−0.067*** (0.017)	−0.059*** (0.013)	−0.057*** (0.013)	−0.059*** (0.014)	−0.059*** (0.013)
Economic growth	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
Trade openness	0.004* (0.002)	0.045* (0.002)	0.008*** (0.003)	0.005** (0.002)	0.005** (0.002)	0.006** (0.002)
Inflation	0.053*** (0.014)	0.048*** (0.014)	0.041*** (0.013)	0.047*** (0.014)	0.038*** (0.013)	0.054*** (0.016)
Instrument	42	44	42	44	42	42
Country/Observation	98/1666	98/1666	98/1666	98/1666	98/1666	98/1666
AR(2) test	0.933	0.904	0.914	0.920	0.927	0.949
Sargan test	0.146	0.125	0.104	0.236	0.118	0.149
Hansen test	0.447	0.456	0.130	0.472	0.386	0.342

Note: ***, **, * are the significant levels at 1%, 5%, 10%.

Table 2.

Institutional quality and public spending – private investment: 1SGMM

Dependent regressor: Private investment

Variables	Regulatory quality	Rule of law	Voice and accoun-tability	Control of corrup-tion	Government effectiveness	Political stability
Private investment (−1)	0.848*** (0.014)	0.845*** (0.014)	0.843*** (0.014)	0.836*** (0.015)	0.841*** (0.014)	0.841*** (0.014)
Public spending	0.024** (0.012)	0.023* (0.013)	0.033*** (0.012)	0.024** (0.012)	0.023* (0.013)	0.031*** (0.011)

Continuation

Variables	Regulatory quality	Rule of law	Voice and accountability	Control of corruption	Government effectiveness	Political stability
Institutional quality	1.199*** (0.401)	1.089** (0.547)	1.321** (0.679)	0.958** (0.478)	1.229*** (0.525)	1.003** (0.463)
Public spending × Institutional quality	–0.052*** (0.014)	–0.058*** (0.020)	–0.054** (0.026)	–0.056*** (0.016)	–0.053*** (0.018)	–0.045*** (0.015)
Economic growth	0.001*** (0.000)	0.002*** (0.000)	0.001*** (0.000)	0.002*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Trade openness	0.012*** (0.002)	0.011*** (0.002)	0.012*** (0.003)	0.012*** (0.002)	0.012*** (0.002)	0.012*** (0.002)
Inflation	0.057*** (0.023)	0.050** (0.023)	0.092** (0.040)	0.044* (0.023)	0.086** (0.040)	0.053** (0.023)
Instrument	43	46	41	46	43	42
Country/Observation	98/1666	98/1666	98/1666	98/1666	98/1666	98/1666
AR(2) test	0.889	0.844	0.863	0.860	0.892	0.901
Sargan test	0.173	0.109	0.177	0.112	0.161	0.214
Hansen test	0.848*** (0.014)	0.845*** (0.014)	0.843*** (0.014)	0.836*** (0.015)	0.841*** (0.014)	0.841*** (0.014)

Note: ***, **, * are the significant levels at 1%, 5%, 10%.

4.2. Robustness check

The paper applies 2DGMM and 1DGMM to examine the robustness of 2SGMM and 1SGMM estimates. It presents 2DGMM and 1DGMM estimates in Table 3 and Table 4, respectively. Each column is the empirical model corresponding to one dimension of governance. Likewise, the paper finds endogeneity of inflation in all estimation procedures, therefore it uses inflation as an instrumented variable in gmm style while the remaining variables as instruments in iv style.

In line with 2SGMM and 1SGMM estimates, the results by 2DGMM and 1DGMM across the models in Table 3 and Table 4 show that public spending and institutional quality promote private investment, while interaction reduces it. Furthermore, trade openness and economic growth promote private investment.

Institutional quality and public spending – private investment: 2DGMM

Dependent regressor: Private investment

Variables	Regulatory quality	Rule of law	Voice and accoun- tability	Control of corrup- tion	Government effectiveness	Political stability
Private investment (−1)	0.055* (0.029)	0.068*** (0.025)	0.086*** (0.027)	0.061** (0.026)	0.060** (0.028)	0.054* (0.028)
Public spending	0.211*** (0.039)	0.193*** (0.032)	0.183*** (0.054)	0.214*** (0.035)	0.172*** (0.035)	0.211*** (0.038)
Institutional quality	4.548*** (1.694)	4.151*** (1.562)	7.290** (3.702)	4.504*** (1.837)	4.007*** (1.699)	3.923*** (1.500)
Public spending × Institutional quality	−0.158*** (0.060)	−0.131** (0.059)	−0.237* (0.139)	−0.145** (0.065)	−0.146*** (0.056)	−0.106** (0.051)
Economic growth	0.072*** (0.023)	0.083*** (0.020)	0.076*** (0.024)	0.077*** (0.022)	0.079*** (0.023)	0.071*** (0.023)
Trade openness	0.086*** (0.017)	0.075*** (0.014)	0.083*** (0.015)	0.086*** (0.016)	0.070*** (0.015)	0.077*** (0.015)
Inflation	−0.021 (0.021)	0.030 (0.032)	−0.007 (0.036)	−0.024 (0.021)	0.014 (0.030)	0.020 (0.031)
Instrument	23	28	28	24	25	25
Country/Observation	98/1666	98/1568	98/1470	98/1568	98/1666	98/1568
AR(2) test	0.120	0.108	0.107	0.133	0.120	0.129
Sargan test	0.611	0.379	0.692	0.732	0.468	0.398
Hansen test	0.561	0.578	0.901	0.590	0.628	0.920

Note: ***, **, * are the significant levels at 1%, 5%, 10%.

Institutional quality and public spending – private investment: 1DGMM

Dependent regressor: Private investment

Variables	Regulatory quality	Rule of law	Voice and accoun- tability	Control of corrup- tion	Government effectiveness	Political stability
Private investment (−1)	0.614*** (0.182)	0.509*** (0.121)	0.580*** (0.136)	0.621*** (0.179)	0.586*** (0.134)	0.680*** (0.148)
Public spending	0.210*** (0.051)	0.191*** (0.049)	0.266*** (0.053)	0.214*** (0.050)	0.210*** (0.050)	0.199*** (0.052)

Continuation

Variables	Regulatory quality	Rule of law	Voice and accoun-tability	Control of corrup-tion	Government effectiveness	Political stability
Institutional quality	7.057***	6.935***	10.078**	7.123***	6.481***	7.026***
	(1.817)	(1.811)	(5.303)	(1.915)	(1.859)	(1.676)
Public spending × Institutional quality	−0.215***	−0.245***	−0.345*	−0.208***	−0.214***	−0.202***
	(0.053)	(0.053)	(0.200)	(0.055)	(0.055)	(0.049)
Economic growth	0.039**	0.048**	0.043***	0.039**	0.040**	0.037**
	(0.017)	(0.022)	(0.017)	(0.017)	(0.017)	(0.018)
Trade openness	0.121***	0.117***	0.122***	0.120***	0.120***	0.124***
	(0.014)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)
Inflation	0.007	0.003	0.013	−0.002	0.004	0.007
	(0.035)	(0.036)	(0.036)	(0.035)	(0.035)	(0.036)
Instrument	21	28	27	23	24	24
Country/Observation	98/1470	98/1470	98/1470	98/1470	98/1470	98/1470
AR(2) test	0.681	0.421	0.556	0.713	0.680	0.935
Sargan test	0.187	0.152	0.479	0.311	0.353	0.474
Hansen test	0.614***	0.509***	0.580***	0.621***	0.586***	0.680***
	(0.182)	(0.121)	(0.136)	(0.179)	(0.134)	(0.148)

Note: ***, **, * are the significant levels at 1%, 5%, 10%.

5. Conclusion and Implications

Government spending can play a significant role in economic development and growth as it is an active instrument of fiscal policy to help worldwide governments manage the economy and tackle its cyclicality. However, it can increase/decrease private investment. Meanwhile, governance quality can contribute positively to the influence of public expenditure/spending on private investment. From these facts, the paper studies the influences of public spending, governance quality, and interaction on private investment for a sample of 98 developing countries over the period of 2002 and 2020. It employs SGMM and DGMM for robustness checks and estimation. The estimated results seem counter-intuitive. Public spending and governance quality promote private investment, while interaction reduces. Furthermore, trade openness, economic growth, and inflation are significant determinants of the private sector's investment in these economies.

The counter-intuitive result does not imply an unusual problem. It notes a low level of development status with a complementary relationship between public expenditure/spending and private investment in developing economies (relation-based institutional settings). Over time, however, this form will shift to a high level with a substitutionary relationship (in advanced economies with rule-based institutional settings). As a result, the findings suggest that governments in these developing economies should reform institutional settings continuously. Accordingly,

these economies will become advanced ones in the future, and the corresponding effect of government expenditure/spending on private investment can transform from a crowding-in effect to a crowding-out effect. This phenomenon is usual because competition in the market-based economy will encourage more proper use of available resources as found in the development status in advanced economies that developing economies are efforting to become. Furthermore, governments in developing economies should rule out unnecessary public projects and leave them to private sectors.

Future studies should think of (i) the distinct roles of the governance quality in government spending – private investment nexus between advanced and developing economies, (ii) the influence of the institutional setting on the government spending – private investment nexus by sector/industry in advanced/developing economies.

Appendix

Table 5.

Data description

Variable	Definition	Type	Source
Private investment (PIN)	Gross fixed capital formation (% GDP)	%	IMF
Public spending (SPE)	Total expenditure consists of total expense and the net acquisition of nonfinancial assets	%	IMF
Economic growth (GDP)	GDP per capita (constant 2015 US$)	log	World Bank
Trade openness (OPE)	Trade is the sum of imports and exports of services and goods (% GDP)	%	World Bank
Inflation (INF)	Inflation, consumer prices (annual %)	%	World Bank
Regulatory Quality (IN1)	Governance indicator	value	World Bank
Rule of Law (IN2)	Governance indicator	value	World Bank
Voice and Accountability (IN3)	Governance indicator	value	World Bank
Control of Corruption (IN4)	Governance indicator	value	World Bank
Government Effectiveness (IN5)	Governance indicator	value	World Bank
Political Stability (IN6)	Governance indicator	value	World Bank

Table 6.

Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Private investment	1,862	23.196	8.331	4.179	80.817
Public spending	1,862	27.130	10.002	4.173	65.856
Economic growth	1,862	5150.06	6418.99	194.873	49578.36
Trade openness	1,862	78.700	34.445	0.167	210.400
Inflation	1,862	6.193	7.155	−7.44	108.893
Regulatory quality	1,862	−0.427	0.636	−1.826	1.724
Rule of law	1,862	−0.375	0.640	−2.270	1.572
Voice and accountability	1,862	−0.386	0.812	−2.810	1.384
Control of corruption	1,862	−0.331	0.644	−2.625	1.538
Government effectiveness	1,862	−0.428	0.628	−1.816	1.555
Political stability	1,862	−0.394	0.767	−2.233	1.292

Table 7.

Matrix of correlation coefficients among variables

	PIN	SPE	GDP	OPE	INF
PIN	1				
SPE	0.176***	1			
GDP	0.113**	0.468**	1		
OPE	0.202***	0.359***	0.285***	1	
INF	−0.024	−0.057***	−0.137***	−0.084***	1

Note: ***, **, *are the significant levels at 1%, 5%, 10%.

Table 8.

Matrix of correlation coefficients among six governance indicators

	IN1	IN2	IN3	IN4	IN5	IN6
IN1	1					
IN2	0.822***	1				
IN3	0.627***	0.530***	1			
IN4	0.717***	0.849***	0.477***	1		
IN5	0.892***	0.876***	0.637***	0.824***	1	
IN6	0.614***	0.540***	0.503***	0.605***	0.626***	1

Note: ***, **, *are the significant levels at 1%, 5%, 10%.

Table 9.

Fisher type unit root tests: 2002–2020

Variables	Augmented Dickey – Fuller test		Phillips – Perron test	
	Prob > chi2		Prob > chi2	
	Without trend	With trend	Without trend	With trend
Private investment	315.77***	257.369***	250.887***	198.598
Public expenditure	196.686	222.038*	232.102**	280.529***
Economic growth	278.607***	174.999	388.989***	117.918
Trade openness	296.997***	284.597***	235.216**	232.399**
Inflation	630.691***	684.337***	847.628***	770.086***
Regulatory quality	283.634***	271.949***	360.511***	329.362***
Rule of law	428.170***	382.623***	382.902***	352.834***
Voice and accountability	373.317***	328.515***	436.315***	411.846***
Control of corruption	336.384***	311.901***	326.770***	311.930***
Government effectiveness	263.847***	290.878***	254.255***	298.238***
Political stability	255.762***	329.424***	315.018***	324.406***

Note: ***, **, *are the significant levels at 1%, 5%, 10%.

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References

Acemoglu D., Johnson S., Robinson J.A. (2005) Institutions As a Fundamental Cause of Long-Run Growth. *Handbook of Economic Growth*, 1, pp. 85–472.

Ahmed I., Qayyum A. (2007) Do Public Expenditure and Macroeconomic Uncertainty Matter to Private Investment? Evidence from Pakistan. *The Pakistan Development Review*, 46, 2, pp. 145–161.

Akinlo T., Oyeleke O.J. (2018) Effects of Government Expenditure on Private Investment in Nigerian Economy (1980–2016). *Emerging Economy Studies*, 4, 2, pp. 147–156.

Arellano M., Bond S. (1991) Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies*, 58, 2, pp. 277–297.

Argimon I., Gonzalez-Paramo J.M., Roldan J.M. (1997) Evidence of Public Spending Crowding-out from a Panel of OECD Countries. *Applied Economics*, 29, 8, pp. 1001–1010.

Aysan A.F., Nabli M.K., Véganzonès-Varoudakis M.A. (2007) Governance Institutions and Private Investment: An Application to the Middle East and North Africa. *The Developing Economies*, 45, 3, pp. 339–377.

Barro R.J. (1974) Are Government Bonds Net Wealth? *Journal of Political Economy*, 82, 6, pp. 1095–1117.

Baum C.F., Schaffer M.E., Stillman S. (2003) XTIVREG2: Stata Module to Perform Extended iv/2sls, gmm and ac/hac, liml and k-class regression for panel data models. *Stata Journal*, 3.

Bedhiye F.M., Singh L. (2021) Fiscal Policy and Private Investment in Developing Economies: Evidence from Ethiopia. *African Journal of Science, Technology, Innovation and Development*, 14, 7, pp.1–15.

De Mendonça H.F., Brito Y. (2021) The Link between Public Debt and Investment: An Empirical Assessment from Emerging Markets. *Applied Economics*, 53, 28, pp. 1–13.

Duho K.C., Amankwa M.O., Musah-Surugu J.I. (2020) Determinants and Convergence of Government Effectiveness in Africa and Asia. *Public Administration and Policy*, 23, 2, pp. 199–215.

Feng Y. (2001) Political Freedom, Political Instability, and Policy Uncertainty: A Study of Political Institutions and Private Investment in Developing Countries. *International Studies Quarterly*, 45, 2, pp. 271–294.

Furceri D., Sousa R.M. (2011) The Impact of Government Spending on the Private Sector: Crowding-out versus Crowding-in Effects. *Kyklos*, 64, 4, pp. 516–533.

Gnangoin Y.T.B., Du L., Assamoi G., Edjoukou A.J., Kassi D.F. (2019) Public Spending, Income Inequality and Economic Growth in Asian Countries: A panel GMM approach. *Economies*, 7, 4, 115.

Gupta S., Davoodi H., Alonso-Terme R. (2002) Does Corruption affect Income Inequality and Poverty? *Economics of Governance*, 3, 1, pp. 23–45.

Holtz-Eakin D., Newey W., Rosen H.S. (1988) Estimating Vector Autoregressions with Panel Data. *Econometrica: Journal of the Econometric Society*, 56, iss. 6, pp. 1371–1395.

Idowu O.F., Okiri I.J., Olarewaju H.I. (2020) Revisiting Government Expenditure and Private Investment Nexus: An ARDL Approach. *Journal Ekonomi Malaysia*, 54, 1, pp. 181–192.

Jorgenson D.W. (1963) Capital Theory and Investment Behavior. *The American Economic Review*, 53, 2, pp. 247–259.

Judson R.A., Owen A.L. (1999) Estimating Dynamic Panel Data Models: A Guide for Macroeconomists. *Economics Letters*, 65, 1, pp. 9–15.

Keynes J.M. (1936) *The General Theory of Employment, Interest, and Money*. London, UK: Macmillan.

Kim T., Nguyen Q.H. (2020) The Effect of Public Spending on Private Investment. *Review of Finance*, 24, 2, pp. 415–451.

Kormendi R.C. (1983) Government Debt, Government Spending, and Private Sector Behavior. *The American Economic Review*, 73, 5, pp. 994–1010.

Li S., Filer L. (2007) The Effects of the Governance Environment on the Choice of Investment Mode and the Strategic Implications. *Journal of World Business*, 42, 1, pp. 80–98.

Marattin L., Salotti S. (2011) On the Usefulness of Government Spending in the EU Area. *The Journal of Socio-Economics*, 40, 6, pp. 780–795.

Munemo J. (2012) Business Regulations and Private Domestic Investment in Africa. *Journal of African Business*, 13, 2, pp. 157–164.

Mwakalila E. (2020) Crowding Out of Private Sector in Tanzania: Government Expenditure, Domestic Borrowing, and Lending Rates. *Emerging Economy Studies*, 6, 1, pp. 123–135.

Omitogun O. (2018) Investigating the Crowding Out Effect of Government Expenditure on Private Investment. *Journal of Competitiveness*, 10, 4, pp. 136–150.

Ortiz-Ospina E., Roser M. (2016) *Government Spending*. Published online at OurWorldInData.org. Retrieved from: https://ourworldindata.org/government-spending [Online Resource].

Oseni I.O., Akinbode S.O., Babalola D.A., Adegboyega S.B. (2020) Government Spending and School Enrolment in Sub-Saharan Africa: A System GMM Approach. *Journal of Economics & Management*, 40, pp. 91–108.

Pesaran M.H., Shin Y., Smith R.P. (1999) Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, 94, 446, pp. 621–634.

Roodman D. (2009) How to Do XTABOND2: An Introduction to Difference and System GMM in Stata. *The Stata Journal*, 9, 1, pp. 86–136.

Şen H., Kaya A. (2014) Crowding-out or Crowding-in? Analyzing the Effects of Government Spending on Private Investment in Turkey. *Panoeconomicus*, 61, 6, pp. 631–651.

Sinevičienė L. (2015) Testing the Relationship between Government Expenditure and Private Investment: The Case of Small open Economies. *Journal of Economics, Business and Management*, 3, 6, pp. 628–632.

Wang B. (2005) Effects of Government Expenditure on Private Investment: Canadian Empirical Evidence. *Empirical Economics*, 30, 2, pp. 493–504.

World Bank (2021) *Worldwide Governance Indicators*. Available at: https://info.worldbank.org/governance/wgi/ [Acessed online 9 February 2022].

Wu D., Zhang Z. (2009) Effects of Government Expenditure on Private Investment-China Empirical Evidence. *2009 First International Workshop on Education Technology and Computer Science*, vol. 3, pp. 86–89. IEEE.

Влияние государственных расходов
на частные инвестиции в развивающихся экономиках:
имеет ли значение институциональное качество?

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Роль институционального качества в отношениях между государственными расходами и частными инвестициями является спорной темой, поскольку институциональное качество может смягчить вытесняющее воздействие государственных расходов на инвестиции частного сектора. Способствует ли институциональное качество взаимодействию государственных расходов и частных инвестиций в развивающихся странах? В этой статье дается ответ путем изучения роли качества управления во взаимосвязи государственных расходов и частных инвестиций для панельного набора данных из 98 развивающихся стран за период с 2002 г. по 2020 г. В ней используются системные/разностные оценки GMM для проверки надежности и оценки. Эмпирические результаты кажутся противоречащими интуиции. Институциональное качество и государственные расходы увеличивают частные инвестиции, в то время как взаимодействие уменьшается. В статье рассматриваются некоторые аргументы для объяснения и предлагаются политические последствия для улучшения институционального качества и увеличения частных инвестиций.

Ключевые слова: государственные расходы, частные инвестиции, развивающиеся экономики, оценки GMM Ареллано – Бонда.

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