Financial additionality: role of multilateral development banks in private participation in infrastructure projects

Taguchi, Hiroyuki

Saitama University

July 2021

Financial Additionality: Role of Multilateral Development Banks in Private Participation in Infrastructure Projects

Hiroyuki Taguchi
Saitama University

Abstract

This paper aims to provide empirical evidence for demonstrating financial additionality of multilateral development banks (MDBs) in private participation in infrastructure (PPI) projects in terms of financing beyond what is available in the markets. To verify MDB financial additionality, this study examines whether the PPI projects with multilateral support have significantly larger investment commitments than the total average projects, by using the PPI database of the World Bank. The empirical analysis identifies MDB financial additionality in that the larger investment commitments of multilateral-supported projects beyond the average are confirmed in any income levels and regions in host countries, and any sectors and types in the projects. In particular, MDB financial additionality is valid even in low-income countries where private finance is still too premature to be available. In the host countries where their government effectiveness is in the poorest edge, however, MDB financial additionality loses its significance, thereby requiring the governance enhancement and capacity building in the host countries for its additionality to work.

Keywords: Financial Additionality, Multilateral development banks, Private participation in infrastructure, Investment Commitments, and Government effectiveness

JEL Classification: F33, O18

1. Introduction

Developing and emerging market economies have been and will be faced with an enormous demand for infrastructure. Global Infrastructure Outlook by the G20 Initiative (Global Infrastructure Hub, 2018) projects that global infrastructure investment needs to reach 94 trillion US dollars by 2040 and forecasts the investment gap of about 15 trillion US dollars – equal to a 16 percent infrastructure investment deficit by that year. The outlook also predicts that meeting the Sustainable Development Goals (SDGs) increases the need by a further 3.5 trillion US dollars, growing the gap to about 18 trillion US dollars. In their projection, developing and some emerging countries continue to have relatively large infrastructure needs and investment gaps. The World Bank (2019) reports that new infrastructure could cost low- and middle-income countries anywhere between 2 percent and 8 percent of gross domestic product (GDP) per year to 2030, and that investments of 4.5 percent of GDP would enable them to achieve the infrastructure-related SDGs.

In accordance with the growing demand for infrastructure, the "private participation in infrastructure" (PPI, hereafter) has come to show a significant presence, particularly, in developing and emerging market economies. It is because they have suffered from a lack of fiscal space to deal with their infrastructure demand, and the PPI has helped fill the gap by leveraging financial resources with private sectors. Looking at the total investment commitments of PPI projects by the World Bank database[1], their values have grown by 7.3 times from 1990 to 2019 while the world GDP has increased by 3.7 times during the same period.[2]

In this context, multilateral development banks (MDBs) are placed to help bridge the gap between infrastructure investment demand and private sector participation in infrastructure projects. MDBs such as the World Bank, Asian Developing Bank and African Development Bank are international institutions that provide financial assistance to developing countries with the clear mandate of promoting their economic and social development. MDBs can play an important role in helping to fund the investment gap, by providing direct financial assistance and also mobilizing additional private sector resources in developing countries (Broccolini et al., 2020). A fundamental principle guiding MDBs' engagement with private sector operations is "additionality": MDB

[1] The PPI Database of the World Bank is obtained by the website: https://ppi.worldbank.org/en/customquery.

[2] The data of the world GDP is retrieved from the World Economic Outlook Databases of the International Monetary Fund: https://www.imf.org/external/pubs/ft/weo/2019/01/weodata/index.aspx.

support of the private sector should make a contribution that is beyond what is available, or that is otherwise absent from the market, and should not crowd out the private sector.[3] The MDB Task Force has materialized the harmonized framework of additionality and provided a more detailed breakdown of what constitutes additionality. In the Task Force report in 2018[4], they define the two types of additionality – financial and non-financial additionality, and show the following criteria as one of examples of evidence to demonstrate financial additionality in terms of financing beyond what is available in the markets: MDBs provide or mobilize meaningfully "larger loan amounts" compared to what is available in the market at reasonable cost and terms (see Table 1).

This paper aims to provide empirical evidence for demonstrating MDB financial additionality in PPI projects in terms of financing beyond what is available in the markets. To verify the existence of MDB financial additionality, this study examines whether the PPI projects with multilateral support have significantly larger investment values than those without the support, by using the PPI database of the World Bank. The larger investment commitments by MDB support in infrastructure projects, particularly, in least developed countries where private financing is not surely expected in the projects, are considered to be a meaningful proof of MDB financial additionality. The major contribution of this study is to quantify MDB financial additionality using the project-level data, while there have been limited empirical studies in this field in the literature.

The remainder of the paper is structured as follows. Section 2 reviews the literature related to the empirical studies of MDB role and clarifies this study's contributions. Section 3 gives an overview of MDB financial additionality in PPI projects. Section 4 conducts an econometric analysis to verify MDB financial additionality by describing key variables and data, methodology, estimation outcomes and discussions. The last section summarizes and concludes the paper.

2. Literature Review and Contributions

This section reviews the literature related to the empirical studies of MDB role and clarifies this study's contributions. The major issue that has so far been discussed as a MDB role is the "mobilization of private finance", that is, the MDB ability to crowd-in capital from private creditors. The MDB role of "resource mobilization" is also identified

[3] The five principles including "additionality" were endorsed by MDBs in 2012 as the "Multilateral Development Bank Principles to Support Sustainable Private Sector Operations". See the website: https://www.ebrd.com/downloads/news/mdb.pdf.

[4] See the website: https://www.adb.org/sites/default/files/institutional-document/456886/mdb-additionality-private-sector.pdf.

as a vital element of financial additionality in the aforementioned MDB Task Force report in 2018, though it is classified differently from the category of "financing beyond what is available in the markets" in this study's focus (see again Table 1).

Regarding the resource mobilization, there have been serious disputes on whether MDB lending has a crowding-in effect or a crowding-out effect on private capital inflows. Rodrik (1995) revealed little evidence that multilateral lending has acted as a catalyst for private capital flows, although it argued a rationale for multilateral lending in terms of information provision and conditionality. Basilio (2017) showed that multilateral support even reduces the private participation in infrastructure projects, thereby implying its substitution effect, through the empirical analysis of the determinants of the projects. On the other hand, Broccolini et al. (2020) identified positive and significant mobilization effects of MDBs on private capital in terms of the size of bank inflows, the number of lenders and the average maturity, by using loan-level data on syndicated lending to a large sample of developing countries. In their study, however, there is no evidence of mobilization effects in the infrastructure sector alone. MDBs themselves estimated their mobilization effects of private finance by collecting the commitment data directly from their own financial reports. MDBs (2019) reported that the total long-term finance mobilized by the MDBs from private investors in all low- and middle- income countries in 2019 was 63.6 billion US dollars, and those for infrastructure sector accounted for 46 percent out of them.

As for the other category, that is, non-financial additionality in Table 1, there have been empirical studies of the following MDB functions: providing a signaling to private markets on investment-friendly environments such as macroeconomic stability and the country's commitment to reform (e.g., Eichengreen and Mody, 2001), mitigating political and credit risks (e.g., Hainz and Kleimeier, 2012; Gurara et al., 2020), and alleviating information asymmetry through technical assistance and capacity building (e.g., Chelsky et al., 2013). However, there have also been counter arguments against the MDB additionality: multilateral lending might create incentives for moral hazard with borrowing government financing low-return projects and delaying reforms, and would even signal severe economic distress (see Broccolini et al., 2020).

While the outcomes of the aforementioned empirical studies have been inconclusive on MDB additionality, this study contributes to enriching its evidence from the following perspectives. First, this study demonstrates MDB financial additionality in terms of financing beyond what is available in the markets, whereas the previous studies have rather concentrated on the aspect of resource mobilization effects on private capital. Basílio (2015) showed the empirical result that the participation of MDBs is higher for

less populous and poorer countries, which could be a proof of MDB financing beyond what is available in the markets. This study extends Basílio (2015) by verifying the larger investment commitments with MDB support than those without it even in least developed countries. Second, this study focuses on the infrastructure sector in terms of PPI projects. The seminal work of Broccolini et al. (2020) could not present evidence of MDB mobilization effects in the infrastructure sector alone, though they identified the effects in the total syndicated lending. Thus, it would be significant if this study could reveal MDB financial additionality in infrastructure sector from another angle.

3. Overview of MDB Financial Additionality

This section gives an overview of MDB financial additionality targeting all the PPI projects for 1996 – 2020 in 121 low- and middle- income countries based on the World Bank PPI database. Table 2 reports how larger investment commitments the individual PPI projects with multilateral support have compared with the average of total projects, as well as the frequency of the projects with multilateral support, for total and categorized projects by income levels, government effectiveness, and regions in the host country, and sectors and types in the projects.

In totally aggregated projects, the number of the projects with multilateral support is 1.167, accounting for 14.30 percent of the total projects numbered 8,161. The average total investment commitments of the projects with multilateral support are 268.4 million US dollars, larger by 18 percent than those of total average projects valued 227.7 million US dollars.

In the first place, the total projects are classified by the host country's income level into those in low-income, and lower-middle-income and upper-middle-income countries, according to the World Bank country classification.[5] In this classification, the investment commitments of the multilateral-supported projects exceed those of total projects by around 20 percent regardless of income classes. The point to be worth noting is that the frequency of the multilateral-supported projects in low-income countries, 18.61 percent, is larger than that of total project, 14.30 percent. It suggests that the multilateral support has been working well even in low-income countries where private finance has been still too premature to accept.

Second, the classification goes to the degree of government effectiveness in the PPI host countries. The government effectiveness index (*gve*) is retrieved from the Worldwide

[5] See the website: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519.

Governance Indicators (WGI) of the World Bank, which takes the number ranging from approximately -2.5 (low) to 2.5 (high).[6] The index represents the government's institutional quality and governance, defined in the database such as "perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies". The interesting finding in Table 2 is that the higher index is attached to the country that the projects belong to, the larger excess in investment commitment values on the multilateral-supported projects relative to those in total average projects is found: 1.19 in $gve > 0$, 1.10 in $-1 < gve < 0$, and 1.04 in $gve < -1$. It should also be noted that in the lowest edge of the index ($gve < -1$), there is little gap in the commitments between the multilateral-supported projects and the total average ones. It implies that the MDB financial additionality, for its better performance, would require the enhancement of the host country' government effectiveness, thereby necessitating the MDB assistances for its capacity building on the PPI projects.

The remaining classifications do not seem to affect seriously the picture in the aforementioned case of the total average projects: the investment commitments of multilateral-supported projects exceed those of total average projects. The points to be worth noting are summarized as follows: in the regional classification, the frequency of multilateral-supported projects is relatively higher in sub-Saharan Africa and lower in Asia and Pacific, while the exceedance in investment commitments of that projects is higher in Asia and Pacific; in the sectoral classification, the energy sector has higher frequency of multilateral-supported projects, 18.69 percent, though it shows relatively lower exceedance in investment commitments of that projects; and in the type classification, there appears to be no serious difference in greenfield and brownfield projects.

The findings above come from the simple observation of the PPI project database. However, the investment commitment values are also affected by time-varying country-specific factors including host country's macroeconomic conditions as well as year fixed effects such as world economic conditions. Here comes the necessity to apply an econometric approach to control these effects in the next section, so that the pure exceedance in investment commitments of multilateral-supported projects could be extracted.

---

[6] See the website: https://info.worldbank.org/governance/wgi/.

4. Econometric Estimations on MDB Financial Additionality

This section conducts an econometric analysis to verify MDB financial additionality by describing variables and data, methodologies, estimation outcomes and discussions.

4.1 Variables and Data

The variables for estimating MDB financial additionality in PPI projects are listed with their measurement and data sources in Table 3. The estimation equation is designed to equip one dependent variable (total investment commitments), five explanatory variables to control time-varying country-specific effects (the host country's macroeconomic conditions), and dummy variables for the projects with multilateral support and for categorizing the projects by income levels, government effectiveness, and regions in the host country, and sectors and types in the projects. The variables for macroeconomic conditions are selected from those used commonly in the related literature on the determinants of PPI (Banerjee et al., 2006; Hammami et al., 2006; Basilio, 2011; and Moszoro et al., 2015). The descriptive statistics of data for the variables are presented in Table 4. The details of each variable are shown as follows.

The total investment commitments (*ppi*) of each PPI project retrieved from the World Bank PPI database are expressed in terms of million US dollars, and transformed in logarithm to avoid scaling problem in the estimation. Regarding the variables for country-specific macroeconomic conditions, the estimation adopts five indicators: Gross Domestic Product (GDP) (*gdp*), GDP per capita (*ypc*), inflation (*inf*), exchange rate (*exr*), and government budget balance (*gbl*): GDP and GDP per capita are shown by current US dollars (GDP by billion US dollars); inflation is expressed by year-on-year rate of changes in consumer prices; exchange rate is presented by the period average of national currency per US dollars; and government budget balance is expressed by the general government net lending or borrowing as a percent of GDP. All the macroeconomic data come from the World Economic Outlook Databases of the International Monetary Fund. GDP, GDP per capita and exchange rate are set in logarithm to avoid scaling issues. All the macroeconomic variables are lagged by one year as they might be endogenous to the model. GDP and GDP per capita are supposed to have coefficients with positive sign since they represent the market size and purchasing power of host countries. The coefficient of inflation is expected to have a negative sign because it shows macroeconomic instability. The coefficient in exchange rate and the negative coefficient of government budget balance are expected to be positive because the currency depreciation and budget deficit

might attract PPI projects in host countries.

Turning to dummy variables, the most important one is the dummy for the projects with multilateral support (*d_multi*) so that MDB additionality can be identified when the coefficient of this dummy is significantly positive. The estimation also equips the dummies by five categories: income levels, government effectiveness, and regions in the host country, and sectors and types in the projects. The reason for adopting these dummies is to check the existence of selection bias: when the projects with multilateral support concentrate only on specific region, sector and type, for instance, the estimation result might lose its validity to prove MDB additionality. The additionality could be justified only when the exceedance of investment commitments for multilateral-supported projects are identified in any components of any categories. For that purpose, the estimation equips cross term of dummies: a dummy for multilateral-supported projects times a dummy of each component in five categories, and the coefficients of these dummies are expected to be significantly positive regardless of the components of the categories. Each category has the following components' dummies: income levels have the dummies of low income (*d_low*), lower middle income (*d_lmid*), and upper middle income (*d_umid*); government effectiveness (*gve*) has the dummies of $gve < -1$ (*d_gvel*), $-1 < gve < 0$ (*d_gvem*), and $gve > 0$ (*d_gveh*); regions have the dummies of Asia and Pacific (*d_Asia*), sub-Saharan Africa (*d_Africa*), and Latin America (*d_Latin*); sectors have the dummies of energy (*d_energy*), transport (*d_transport*), and others (*d_other*); and types have the dummies of greenfield (*d_green*) and brownfield (*d_brown*). The data used for the classification are just the same as the one in Section 3.

Then the study constructs an unstructured dataset with 8,161 PPI projects for 1996 – 2020 containing 121 countries for the subsequent estimation, which follows the data constraint of each variable.

4.2 Methodologies

The equations for the estimation are specified as follows. For the simple estimation of total projects:

$$\ln ppi_{itk} = \beta * E_{it} + \mu * d\_multi_k + \nu_t + \varepsilon_{itk} \quad (1)$$

$$ppi_{itk} = \exp [\beta * E_{it} + \mu * d\_multi_k) + \nu_t] + \varepsilon_{itk} \quad (2)$$

For the estimation considering five categories of the projects:

$$\ln ppi_{itk} = \beta * E_{it} + \gamma * D_j + \mu * (d\_multi_k * D_j) + \nu_t + \varepsilon_{itk} \quad (3)$$

$$ppi_{itk} = \exp [\beta * E_{it} + \gamma * D_j + \mu * (d\_multi_k * D_j) + \nu_t] + \varepsilon_{itk} \quad (4)$$

where Equation (1) and (3) are the form of ordinary least squares (OLS) estimation and Equation (2) and (4) are the one of Poisson Pseudo Maximum Likelihood (PPML) estimation. The subscripts *i*, *t*, and *k* denote host countries (the 121 low- and middle-income countries), years (1996–2020), and project number (8,161 PPI projects), respectively; *E* is the variables for country-specific time-varying macroeconomic conditions: GDP (*gdp*), GDP per capita (*ypc*), inflation (*inf*), exchange rate (*exr*), and government budget balance (*gbl*); ν denotes year fixed effects; ε is error terms; β, γ, and μ are parameters of variables; and D_j is the dummies under the five categories: j = 1, 2, …, 5, that is, *d_low*, *d_lmid*, and *d_umid* in income levels; *d_gvel*, *d_gvem*, *d_gveh* in government effectiveness; *d_Asia*, *d_Africa*, and *d_Latin* in regions; *d_energy*, *d_transport*, and *d_other* in sectors; and *d_green* and *d_brown* in types. The most critical parameter is μ, in particular, in Equation (3) and (4), that is, the coefficient of cross term of dummies: a significantly positive coefficient in any components of any categories implies the existence of MDB additionality.

The reason why this study applies the PPML estimator in Equation (2) and (4) as well as the OLS one in Equation (1) and (3) is that the investment commitments in the PPI database contain zero value and are plagued by "heteroskedasticity" problem. The OLS estimator with log-linear form drops zero observations from estimation sample and also leads to a bias and an inconsistency in its estimate under the heteroskedasticity. Instead, as Santos Silva and Tenreyro (2006) advocated, the PPML estimator takes advantage of information with zero value and accounts for the heteroskedasticity. This study applies both estimators for a robustness check.

4.3 Estimation Outcomes and Discussions

Table 5 reports the results of OLS estimation on total projects in Equation (1) and on the projects containing five categories in Equation (3), and Table 6 reports the results of PPML estimation in Equation (2) and (4) in the form of log-link function.

Both OLS and PPML estimations show almost the same outcomes in the sign and significance of each coefficient except its magnitude. Looking at the estimation results on total projects in Column (a), the coefficients of the dummies for multilateral-supported projects (*d_multi*) are exp. (0.671) = 1.956 in OLS estimation in Table 5 and exp. (0.157) = 1.170 in PPML estimation in Table 6. Considering that the investment commitments of

multilateral-supported projects are larger than those of total average projects by 18 percent from the simple observation in Section 3, the PPML estimation that can deal with the zero value and heteroskedasticity seems to reveal a reasonable result. Thus, the subsequent description focuses on the results of PPML estimation.

Regarding macroeconomic variables, it is commonly found from Column (a) to (f) that the coefficients of GDP per capita (*ypc*) and exchange rate (*exr*) are significantly positive and the government budget balance (*gbl*)'s coefficient is significantly negative, as are expected in Section 4.1., and that the coefficients of GDP (*gdp*) and inflation (*inf*) are insignificant, which suggests that the market size and price stability of host countries are not an important factors to affect the PPI investments.

The result focusing on the category of income levels shown in Column (b) shows that all the coefficients of the cross terms of dummies, *d_multi* times *d_low*, *d_lmid*, and *d_umid* are significantly positive. It should be noted that the low-income countries represented by *d_multi* times *d_low* have the largest magnitude of coefficients. This implies that the multilateral support has been effective even in low-income countries in terms of its financial additionality in PPI projects. As for the category of government effectiveness (*gve*), the cross term of *d_multi* times *d_low* is insignificant whereas the other cross terms are significantly positive. This means that in the host countries where their government effectiveness index is extremely low by $gve < -1$, multilateral support loses its significance, thereby requiring the governance enhancement and capacity building in the host countries for MDB financial additionality to work. In the other categories, that is, regions, sectors, and types, all the coefficients of the cross terms are significantly positive regardless of their components, implying the validity of MDB financial additionality.

The findings above contribute to the literature in this field as follows. First, the result of identifying MDB additionality in low-income countries in this study seems to be consistent with Basilio (2015), which argued the high participation of MDBs in poorer countries. Second, the new finding of this study is that the estimation verifies the MDB role in infrastructure projects, whereas Basilio (2017) and Broccolini et al. (2020) could not find out MDB mobilization effect in the infrastructure sector. Third, another new insight in this study is that MDB additionality role is affected by the host country's government effectiveness, which implies some need for MDB assistances for capacity building.

In sum, the econometric estimation verifies MDB financial additionality in PPI projects, as the exceedances in investment commitments of multilateral-supported projects compared to the total average projects are identified in any income levels, regions,

sectors and types. In particular, MDB financial additionality is valid even in low-income countries where private finance is still too premature to be available. It is also found that in the host countries where their government effectiveness is in the poorest edge, MDB financial additionality loses its significance, thereby requiring the governance enhancement and capacity building in the host countries for its additionality to work.

5. Concluding Remarks

This paper attempted to provide empirical evidence for demonstrating MDB financial additionality in PPI projects in terms of financing beyond what is available in the markets. To verify the existence of MDB financial additionality, this study examined whether the PPI projects with multilateral support have significantly larger investment commitments than the total average projects, by using the PPI database of the World Bank. The major contribution of this study is to quantify MDB financial additionality using the project-level data, while there have been limited empirical studies in this field in the literature.

The main findings through the data observation and econometric analysis are summarized as follows. MDB financial additionality is identified in PPI projects in that the larger investment commitments of multilateral-supported projects beyond the average are confirmed in any income levels and regions in host countries, and any sectors and types in the projects. In particular, MDB financial additionality is valid even in low-income countries where private finance is still too premature to be available, in terms of the large investment commitments and the higher frequency of multilateral-supported projects in these countries. In the host countries where their government effectiveness is in the poorest edge, however, MDB financial additionality loses its significance, thereby requiring the governance enhancement and capacity building in the host countries for its additionality to work.

References

Banerjee, S.G., Oetzel, J.M., and Ranganathan, R. 2006. Private Provision of Infrastructure in Emerging Markets: Do Institutions Matter? *Development Policy Review* 24: 175–202.

Basilio, M.S. 2011. Infrastructure PPP investments in Emerging Markets. *ResearchGate*: https://www.researchgate.net/publication/265219817_Infrastructure_PPP_investments_in_Emerging_Markets.

Basílio, M.S. 2015. The Determinants of Multilateral Development Banks' Participation in Infrastructure Projects. *Journal of Infrastructure Development* 6: 83–110.

Basılio, M.S. 2017. The degree of private participation in PPPs: evidence from developing and emerging economies. In *The Emerald Handbook of Public–Private Partnerships in Developing and Emerging Economies*. Edited by João Leitão, J., Sarmento, E.M., and Aleluia, J. Bingley: Emerald Publishing Limited, pp. 81–111.

Broccolini, C., Lotti, G., Maffioli, A. Presbitero, A. F., and Stucchi, R. 2021. Mobilization Effects of Multilateral Development Banks. *The World Bank Economic Review* 35: 521–543.

Chelsky, J., Morel, C., and Kabir, M. 2013. Investment Financing in the Wake of the Crisis: The Role of Multilateral Development Banks. *World Bank Economic Premise* No. 121.

Eichengreen, B.J., and Mody, A. 2001. Bail-Ins, Bailouts, and Borrowing Costs. *IMF Staff Papers* No. 47.

Global Infrastructure Hub. 2018. *Global Infrastructure Outlook*. Sydney: Global Infrastructure Hub.

Gurara, D., Presbitero, A, and Sarmiento, M. 2020. Borrowing Costs and the Role of Multilateral Development Banks: Evidence from Cross-Border Syndicated Bank Lending. *Journal of International Money and Finance* 100: 1-18.

Hainz, C., and Kleimeier, S. 2012. Political Risk, Project Finance, and the Participation of Development Banks in Syndicated Lending. *Journal of Financial Intermediation* 21: 287–314.

Hammami, M., Ruhashyankiko, J.F., and Yehoue, E.B. 2006. Determinants of Public-Private Partnerships in Infrastructure. *IMF Working Paper* WP/06/99.

MDBs. 2021. *Mobilization of Private Finance by Multilateral Development Banks and Development Finance Institutions 2019*. Washington DC: World Bank.

MDB Task Force. 2018. *Multilateral Development Banks' Harmonized Framework for Additionality in Private Sector Operations*.

Moszoro, M., Araya, G., Ruiz-Nuez, F., and Schwartz, J. 2015. Institutional and political determinants of private participation in infrastructure. In *Public Private Partnerships for Transport Infrastructure: Renegotiations, How to Approach Them and Economic Outcomes*. Washington DC: ITF Roundtable.

Rodrik, D. 1995. Why is There Multilateral Lending? *NBER Working Paper* No. 5160.

Santos Silva J.M.C., and Tenreyro, S. 2006. The Log of Gravity. *Review of Economics and Statistics* 88: 641–658.

World Bank. 2019. *Beyond the Gap*. Washington DC: World Bank.

Table 1 MDB Additionality in Private Sector Operation

Category	Type
Financial Additionality	Funancing Structure (Financing Beyond What is Available in the Markets) Amount: MDBs provide or mobilize meaningfully larger loan amounts compared to what is available in the market at reasonable cost and terms.
	Innovative Financing Structures and/or Instruments
	MDBs' Own Account Equity
	Resource Mobilization
Non-Financial Additionality	Risk Mitigation
	Policy, Sector, Institutional, or Regulatory Change
	Standard-Setting: Helping Projects and Clients Achieve Higher Standards
	Knowledge, Innovation, and Capacity Building

Sources: Extracted from MDB Task Force (2018)

Table 2 Overview of MDB Financial Additionality in PPI Projects

	Total Projects		Projects with multilateral support		c/a (%)	d/b
	Number (a)	Investment (ave. mil $) (b)	Number (c)	Investment (ave. mil $) (d)		
Total	8,161	227.7	1,167	268.4	14.30	1.18
[Host Country's Income Levels]						
Low	908	132.5	169	163.2	18.61	1.23
Lower middle	3,216	208.0	495	248.6	15.39	1.20
Upper middel	4,037	264.8	503	323.3	12.46	1.22
[Host Country's Government Effectiveness (gve)]						
gve < -1	116	225.8	27	235.7	23.28	1.04
-1 < gve < 0	4,046	237.4	653	261.3	16.14	1.10
gve > 0	3,040	224.8	340	268.1	11.18	1.19
[Host Country's Regions]						
Asia and Pacific	3,880	199.9	281	292.0	7.24	1.46
Sub-Saharan Africa	483	190.0	147	253.5	30.43	1.33
Latin America	2,746	235.7	469	255.8	17.08	1.09
[Project's Sectors]						
Energy	4,602	212.3	860	237.6	18.69	1.12
Transport	1,935	339.2	186	397.4	9.61	1.17
Others	1,624	138.4	121	289.0	7.45	2.09
[Project's Types]						
Greenfield	5,085	222.7	740	256.1	14.55	1.15
Brownfield	2,186	216.7	264	290.1	12.08	1.34

Sources: Author's calculation based on the World Bank PPI database.

Table 3 List of Variables

Variables	Description	Data Sources
Dependent Variables		
ppi	Total Investment Commitments of PPI [million USD, log term]	WB_PPI
Explanatory Variables: Host Country's Macroeconomic Conditions		
gdp	Gross Domestic Product [current USD, log term, lagged]	
ypc	GDP per capita [current USD, log term, lagged]	
inf	Inflation, consumer prices [annual %, lagged]	IMF_WEO
exr	National currency per USD [period average, log term, lagged]	
gbl	General government net lending/borrowing [percent of GDP, lagged]	
Explanatory Variables: Dummy Variables [*d_x* =1, othewise o]		
d_nulti	Projects with multilateral support	WB_PPI
<Host Country's Income Levels>		
d_low	Low income	
d_lmid	Lower middle income	WB_CL
d_umid	upper middle income	
<Host Country's Government Effectiveness (*gve*)>		
d_gvel	$gve < -1$	
d_gvem	$-1 < gve < 0$	WB_WGI
d_gveh	$gve > 0$	
<Host Country's Regions>		
d_Asia	Asia and Pacific (East Asia and Pacific, and South Asia)	
d_Africa	Sub-Saharan Africa	WB_PPI
d_Latin	Latin America (Latin America and the Caribbean)	
<Project's Sectors>		
d_energy	Energy	
d_tranport	Transport	WB_PPI
d_other	Others (ICT, Water and Sewerage, and Municipal Solid Waste)	
<Project's Types>		
d_green	Greenfield project	WB_PPI
d_brown	Brownfield project	

Notes:
WB_PPI: PPI database, World Bank
IMF_WEO: World Economic Outlook Database, International Monetary Fund
WB_CL: Country Classification, World Bank
WB_WGI: Worldwide Governance Indicators, World Bank
Source: Author's description

Table 4 Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max
ppi	8,108	229	666	1	35,587
gdp	7,894	2,071	3,288	0	14,340
ypc	7,891	4,940	3,831	159	18,832
inf	7,850	6.39	8.13	-3.90	325.03
exr	7,888	602	2,844	0	31,458
gbl	7,790	-3.45	3.23	-33.59	21.76

Source: Author's estimation

Table 5 OLS Estimation Results

	(a)	(b)	(c)
gdp	0.001	-0.002	0.000
	(0.161)	(-0.245)	(0.975)
ypc	0.377 ***	0.283 ***	0.329 ***
	(20.504)	(5.579)	(11.829)
inf	0.003	0.003	0.003
	(1.315)	(1.282)	(1.210)
exr	0.088 ***	0.072 ***	0.074 ***
	(10.079)	(6.891)	(7.165)
gbl	-0.055 ***	-0.049 ***	-0.050 ***
	(-9.125)	(-7.770)	(-7.810)
d_low		1.265 ***	
		(2.924)	
d_lmid		1.265 ***	
		(2.709)	
d_umid		1.328 **	
		(2.534)	
d_gvel			1.261 ***
			(3.451)
d_gvem			0.890 ***
			(2.647)
d_gveh			0.825 **
			(2.427)
d_nulti	0.671 ***		
	(12.557)		
*d_multi * d_low*		0.703 ***	
		(4.872)	
*d_multi * d_lmid*		0.631 ***	
		(7.705)	
*d_multi * d_umid*		0.660 ***	
		(8.615)	
*d_multi * d_gvel*			0.342
			(0.979)
*d_multi * d_gvem*			0.626 ***
			(9.057)
*d_multi * d_gveh*			0.582 ***
			(6,232)
Year Fixed Effect	Yes	Yes	Yes
Observation	7,357	7,357	7,357

(Continued)

	(d)	(e)	(f)
gdp	0.045 ***	0.008	-0.004
	(3.008)	(0.738)	(-0.403)
ypc	0.352 ***	0.303 ***	0.387 ***
	(15.509)	(11.232)	(20.909)
inf	0.001	0.002	0.003
	(0.426)	(0.828)	(1.274)
exr	0.102 ***	0.055 ***	0.090 ***
	(10.137)	(5.530)	(10.060)
gbl	-0.062 ***	-0.026 ***	-0.056 ***
	(-10.102)	(-4.210)	(-9.212)
d_Asia	-0.465 ***		
	(-5.823)		
d_Africa	0.011		
	(0.103)		
d_Latin	-0.284 ***		
	(-4.193)		
d_energy		1.250 ***	
		(3.808)	
d_tranport		1.871 ***	
		(5.685)	
d_other		0.533	
		(1.621)	
d_green			-0.110 *
			(-1.732)
d_brown			-0.109
			(-1.578)
*d_multi * d_Asia*	0.860 ***		
	(8.526)		
*d_multi * d_Africa*	0.695 ***		
	(4.310)		
*d_multi * d_Latin*	0.603 ***		
	(7.350)		
*d_multi * d_ebergy*		0.617 ***	
		(10.288)	
*d_multi * d_transport*		0.474 ***	
		(3.898)	
*d_multi * d_other*		1.321 ***	
		(8.632)	
*d_multi * d_green*			0.617 ***
			(9.228)
*d_nulti * d_brown*			0.726 ***
			(6.856)
Year Fixed Effect	Yes	Yes	Yes
Observation	7,357	7,357	7,357

Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively. The figure in () denotes t-value. The coefficients of the time dummy are omitted here due to the space limitation.

Sources: Author's estimation

Table 6 PPML Estimation Results

	(a)	(b)	(c)
gdp	0.002	-0.000	-0.000
	(0.619)	(-0.169)	(-0.050)
ypc	0.115 ***	0.067 ***	0.079 ***
	(18.995)	(4.185)	(8.899)
inf	0.000	0.000	0.000
	(1.071)	(0.996)	(0.949)
exr	0.027 ***	0.017 ***	0.017 ***
	(9.983)	(5.258)	(5.474)
gbl	-0.015 ***	-0.012 ***	-0.012 ***
	(-8.217)	(-5.927)	(-5.961)
d_low		0.725 ***	
		(5.282)	
d_lmid		0.727 ***	
		(4.916)	
d_umid		0.745 ***	
		(4.480)	
d_gvel			0.721 ***
			(6.190)
d_gvem			0.635 ***
			(5.917)
d_gveh			0.623 ***
			(5.755)
d_nulti	0.157 ***		
	(9.745)		
*d_multi * d_low*		0.172 ***	
		(3.780)	
*d_multi * d_lmid*		0.147 ***	
		(5.833)	
*d_multi * d_umid*		0.140 ***	
		(8.217)	
*d_multi * d_gvel*			0.079
			(0.745)
*d_multi * d_gvem*			0.140 ***
			(6.730)
*d_multi * d_gveh*			0.128 ***
			(4,569)
Year Fixed Effect	Yes	Yes	Yes
Observation	7,357	7,357	7,357

(Continued)

	(d)	(e)	(f)
gdp	0.007	0.001	0.000
	(1.569)	(0.513)	(0.089)
ypc	0.118 ***	0.072 ***	0.118 ***
	(15.629)	(8.128)	(19.205)
inf	0.000	0.000	0.000
	(0.751)	(0.620)	(1.057)
exr	0.028 ***	0.013 ***	0.027 ***
	(8.795)	(4.000)	(9.848)
gbl	-0.017 ***	-0.006 ***	-0.016 ***
	(-8.986)	(-3.122)	(-8.220)
d_Asia	-0.073 ***		
	(-2.935)		
d_Africa	0.031		
	(0.912)		
d_Latin	-0.067 ***		
	(-3.172)		
d_energy		0.731 ***	
		(6.821)	
d_tranport		0.872 ***	
		(8.117)	
d_other		0.538 ***	
		(5.007)	
d_green			-0.015
			(-0.752)
d_brown			-0.019
			(-0.883)
*d_multi * d_Asia*	0.199 ***		
	(6.581)		
*d_multi * d_Africa*	0.170 ***		
	(3.469)		
*d_multi * d_Latin*	0.137 ***		
	(5.574)		
*d_multi * d_ebergy*		0.139 ***	
		(7.375)	
*d_multi * d_transport*		0.095 ***	
		(2.623)	
*d_multi * d_other*		0.332 ***	
		(6.778)	
*d_multi * d_green*			0.144 ***
			(7.153)
*d_nulti * d_brown*			0.162 ***
			(5.126)
Year Fixed Effect	Yes	Yes	Yes
Observation	7,357	7,357	7,357

Note: *** denotes rejection of null hypothesis at the 99% level of significance, respectively. The figure in () denotes t-value. The coefficients of the time dummy are omitted here due to the space limitation.

Sources: Author's estimation