THE RELATIONSHIP BETWEEN INFRASCOPE INDEX & PRIVATE INVESTMENT IN INFRASTRUCTURE IN LOW TO MIDDLE INCOME COUNTRIES

by

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1.0 Introduction

Poverty reduction and sustainable growth can only be achieved with adequate infrastructure systems around the world. Developing countries have become major drivers of growth (Bhattacharya et al., 2015) and as such increased investment in infrastructure is required to sustain growth in these regions and beyond. Falling global commodity prices and high levels of political uncertainty have led to a common theme of slow growth across various regions in recent years. Economic growth in Latin America and Caribbean has been on the decline for the past five years (IMF, 2015). The average GDP growth across the Sub-Saharan Africa has been higher than most of the other developing economies except China for several years now despite the Ebola epidemic, violent insurgencies and declining commodity prices taking a toll on overall growth in the region (The World Bank, 2015). Between 2016 and 2017, growth in the United States is expected to remain largely flat (IMF, 2016 (i)). Poverty reduction and sustainable growth can only be achieved with adequate infrastructure

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systems around the world. Developing countries have become major drivers of growth (Bhattacharya et al., 2015) and as such increased investment in infrastructure is required to sustain growth in these regions and beyond. Falling global commodity prices and high levels of political uncertainty have led to a common theme of slow growth across various regions in recent years. Economic growth in Latin America and Caribbean has been on the decline for the past five years (IMF, 2015). The average GDP growth across the Sub-Saharan Africa has been higher than most of the other developing economies except China for several years now despite the Ebola epidemic, violent insurgencies and declining commodity prices taking a toll on overall growth in the region (The World Bank, 2015). Between 2016 and 2017, growth in the United States is expected to remain largely flat (IMF, 2016 (i)). According to an October 2016 report from the International Monetary Fund (IMF), the short and long term forces which have direct impacts on productivity point to subdued global growth for 2016 (IMF, 2016 (ii)). According to an October 2016 report from the International Monetary Fund (IMF), the short and long term forces which have direct impacts on productivity point to subdued global growth for 2016 (IMF, 2016 (ii)). The motivation behind this study is to analyze critical factors for successful private sector participation in infrastructure development in developing economies. This is goal is achieved by correlating Infrascope Index scores from the Economist Intelligence Unit and private activity in infrastructure investment expressed as the number of projects reaching financial closure. This paper is divided into three main sections. The first section provides a description of the data sources for analysis and also lays out the focus of the study. In the second section, the results of the analysis are discussed in detail. Finally, the third chapter provides a summary of the findings as well as recommendations for decision-makers and policy leaders.

1.1 The World Bank's PPI Database

The World Bank's Private Participation in Infrastructure (PPI) database has information on over 6400 infrastructure projects with increased private sector participation which implies the private partners bear a portion of the project's operating costs and risks (PPI, 2016 (i)). This database covers 139 low to middle-income countries in 6 regions: East Asia & Pacific, South Asia, Europe & Central Asia, Middle East & North Africa, South Asia and Sub-Saharan Africa. For the 2017 fiscal year, low-income economies were defined as those with gross national income (GNI) per capita of $1,025 or less in 2015 calculated using the World Bank Atlas method. Lower middle income economies have GNI per capita between $1,026 and $4,035. Upper-middle income and high-income economies have GNI per capita between $4,036 and $12,475 and above $12,476 respectively (The World Bank, 2016). The database focuses on 4 main infrastructure sectors including energy, water, transport and ICT (Information & communication technology). The PPI Database classifies private participation in infrastructure projects into four main categories (Figure 1). In a greenfield project, the private partners take on construction risks in addition to other forms of risks by building new facilities. There are various types of build-operate-transfer (BOT), build-lease-transfer (BLO) and a merchant agreement. On the other hand, a brownfield project is type of an agreement where the private sector invests capital for the rehabilitation or agreements under greenfield projects such as

Figure 1. Private Participation in Infrastructure Classification

expansion of an existing asset for operation. In management and lease contracts, private

partners agree to take over the management of a public asset with ownership still remaining in the public sector. Lastly, divestiture refers to a private sector partner buying an equity stake in a publicly-owned asset. Full definitions for the sub-categories of the four types of private participation can be accessed from the PPI Database methodology (PPI, 2016 (ii)).

1.2 Infrascope Indexes

The Infrascope Index refers to a benchmarking index developed by The Economist Intelligence Unit (EIU) to evaluate the capacity of countries in various regions to successfully implement sustainable public-private partnerships for infrastructure development. To date, the benchmark indexes have been computed for the three regions: Latin America & Caribbean, Asia-Pacific and Africa. The

methodology for the index was first developed in 2009 (EIU, 2015).

Countries are assessed on a 0-100 scale with scores closer to 100 indicating countries which are prepared and are able to implement infrastructure projects with increased private sector participation. The scores are based on 19 indicators which can be broadly categorized into 5 main groups. Table 1 shows the various indicators and their corresponding weights. Detailed definitions and scoring criteria information on the indicators can be obtained by accessing the reports for each region.

Geographically, the Latin America and Caribbean region consists of 33 countries but only 19 countries had Infrascope Index scores available in the database for the year 2014 (EIU 2014(i)). Countries considered in this region were: Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras,

Table 1. Infrascope Score Indicators & Weights (EIU, 2015; EIU, 2014 (i); EIU, 2014 (ii))

	Category weight (%)	Indicator	Weight (%)
Regulatory Framework	25	1. Consistency and quality of P3 regulations	37.50
		2. Effective P3 selection and decision-making	25.00
		3. Fairness/openness of bids, contract changes	12.50
		4. Dispute resolution	25.00
Institutional Framework	20	5. Quality of institutional design	66.67
		6. P3 contract, hold-up and expropriation risk	33.33
Operational Maturity	15	7. Public capacity to plan and oversee P3s	25.00
		8. Methods and criteria for awarding projects	12.50
		9. Regulators' risk-allocation record	12.50
		10. Experience in P3 concessions	25.00
		11. Quality of P3 projects	25.00
Investment Climate	15	12. Political Distortion	25.00
		13. Business Environment	25.00
		14. Political will	50.00
Financial Facilities	15	15. Government Payment Risk	22.22
		16. Capital markets	44.44
		17. Marketable debt	22.22
		18. Government support and affordability for low-income users	11.11
Subnational Adjustment	10	19. Subnational adjustment factor	100.00

Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad & Tobago, Uruguay and Venezuela. The total gross national income (GNI) per capita of this region is approximated to be around $15,000.

The 2015 Infrascope for Africa was the first of its kind for the region and covered the period between November 2014 and January 2015 (EIU, 2015). Countries included in the report were Angola, Cameroon, Cote d'Ivoire, Democratic Republic of Congo, Egypt, Ghana, Kenya, Morocco, Nigeria, Rwanda, South Africa, Tanzania, Tunisia, Uganda and Zambia. The total gross national income (GNI) per capita of this region is approximated to be around $ 4,500.

The 2014 Asia-Pacific Infrascope Index covered the following states: Armenia, Australia, Bangladesh, China, Georgia, India, India- Gujarat State, Indonesia, Japan, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Pakistan- Sindh province, Papua New Guinea, Philippines, Republic of Korea, Tajikistan, Thailand, United Kingdom and Vietnam (EIU, 2014 (ii)).

1.3 Focus of study
Prior to analyzing the data sets, the first step was to reassign countries in the most recent Infrascope indexes for LAC (2014), Asia-Pacific (2014) and Africa (2015) with their corresponding regions from the PPI database. This implied that countries in the Africa Infrascope were in either the Middle East & North Africa (MENA) region or the Sub-

Saharan Africa (SSA) region. Asia-Pacific region was also categorized into South Asia, East Asia & Pacific and Europe & Central Asia. This study focused on activity in the Latin America & Caribbean (LAC) and Sub-Saharan Africa (SSA) regions as classified in the PPI database from 2011 to 2015. In the last few years, both regions have experienced slowdown in economic growth as a result of the decline in global commodity prices (Cohen and Wallace, 2016; IMF Survey, 2016). Additionally, the focus on these two regions was based on their similarities with respect to average Infrascope scores (Figure 3) and potential for growth.

Compiling Infrascope indexes for all six regions and plotting on radar chart showed the LAC and SSA having similar average scores for regulatory framework, institutional framework and operational maturity (Figure 2). These three factors accounted for 60% of the total weights for the overall Infrascope
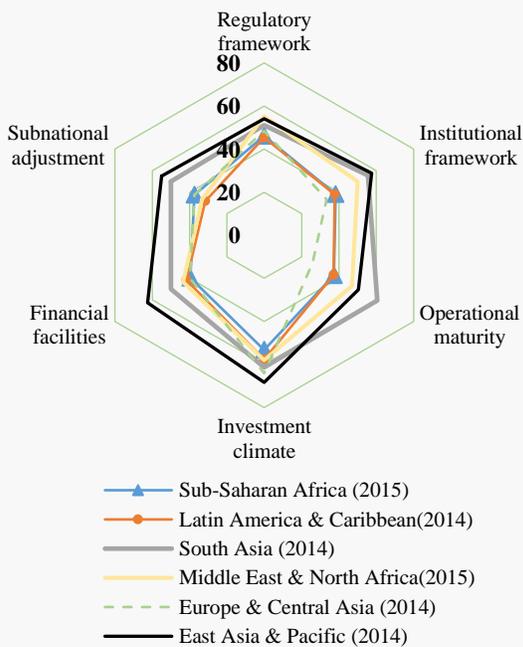

Figure 2. Average Infrascope Scores for across World Bank regions

scores (Table 1). While both regions have experienced subdued GDP growth over the years (Figure 3), the number of projects reaching financial closure in countries across the regions vary significantly (The World Bank, 2016 (ii)). The data indicates South Africa as the only country in the SSA region with more than 50 projects reaching financial closure within the analysis period. Despite the aforementioned similarities in average Infrascope scores, there were four countries in the LAC region which recorded more than 50 projects each from 2011 to 2015. These were Mexico, Peru, Chile and Brazil. This observation underscores a major difference in terms of private participation in infrastructure development between the two regions.

2.0 Analysis

The main goal for the analysis was to analyze the relationship between the number of deals reaching financial closure and the Infrascope scores for the two regions under consideration. The inherent relationships will shed light on the capability of governments to close infrastructure deals with private partners given prevailing economic and institutional conditions. The results of this study could help inform decision-makers on which policies to focus on to attract private sector investment in infrastructure in the future.

2.1 Sub-Saharan Africa

For the SSA region, South Africa had the highest number (62) of projects financial closure between 2011 and 2015 (Figure 4). This was about 9 times larger than the next ranked country in this region Kenya, which had a total of 7 projects. In comparison, and the Democratic Republic of Congo had only 1 project reaching financial closure during the same timeframe. Greenfield projects formed about 95% of all projects reaching
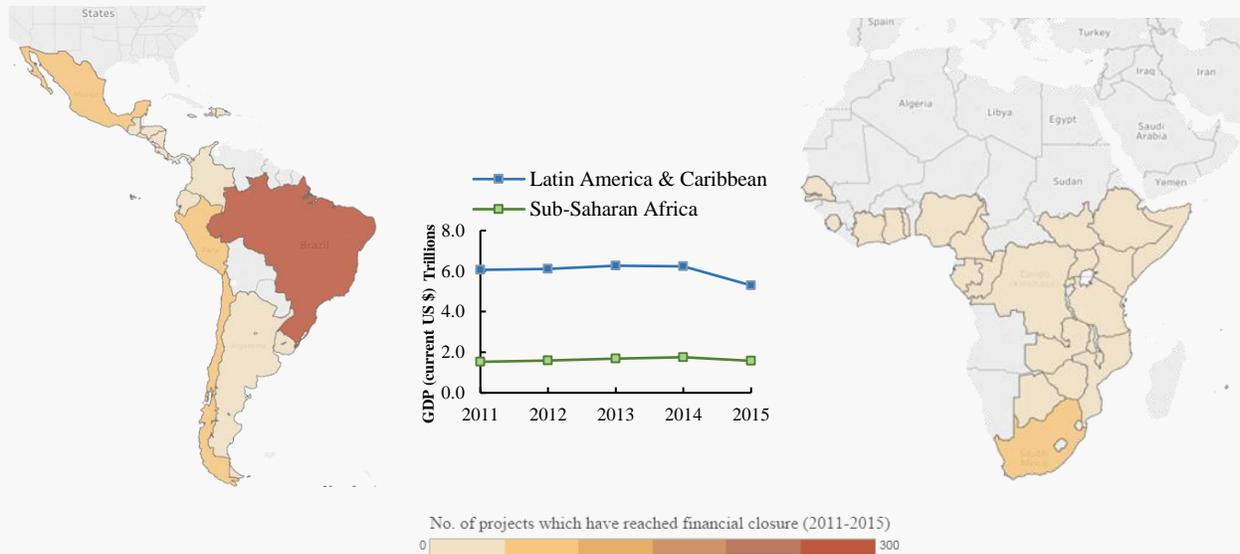
Figure 3. Number of projects reaching financial closure from 2011 to 2015 in Latin America & Caribbean and Sub-Saharan Africa

financial closure in the region. The countries such as Cote d'Ivoire, Cameroon high number of greenfield projects highlighted the region's need for new infrastructure to support its growth.

South Africa has very high scores for financial facilities compared to the other countries in the region (Figure 4). To put that in perspective, South Africa had a score of 91.7 for financial facilities while Kenya which ranked second in terms of the number of projects reaching financial closure also came in second with a score of 55.6 for financial facilities. The Democratic Republic of Congo had the lowest overall score of 20.6 but scored relatively higher for investment climate. The top two countries with the highest number of deals closed between 2011 and 2015 had the highest financial facilities score respectively signaling the importance of this factor in the region.

Correlating Infrascope scores with total number of projects reaching financial closure

showed that overall score was highly correlated with financial facilities and institutional frameworks in the region (Figure 5). The total number of projects from 2011 to 2015 was also highly correlated with the financial facilities score. An interesting point to note is that the weighting for financial facilities in the overall score was only 15%. A closer look at the financial facilities score explains why these trends are being observed. This score is calculated based on 4 subcategories namely: government support for low income users of capital market for private infrastructure and marketable debt. Due to the high perception of risk in the region, countries such as South Africa with sophisticated local capital markets (Sheppard et al., 2006) will be able the facilities, government payment risk, to attract a higher number of infrastructure deals. Political instability has been a major issue affecting worth noting that the lack of well-developed local financial institutions also leads to currency risks which makes investors leery.
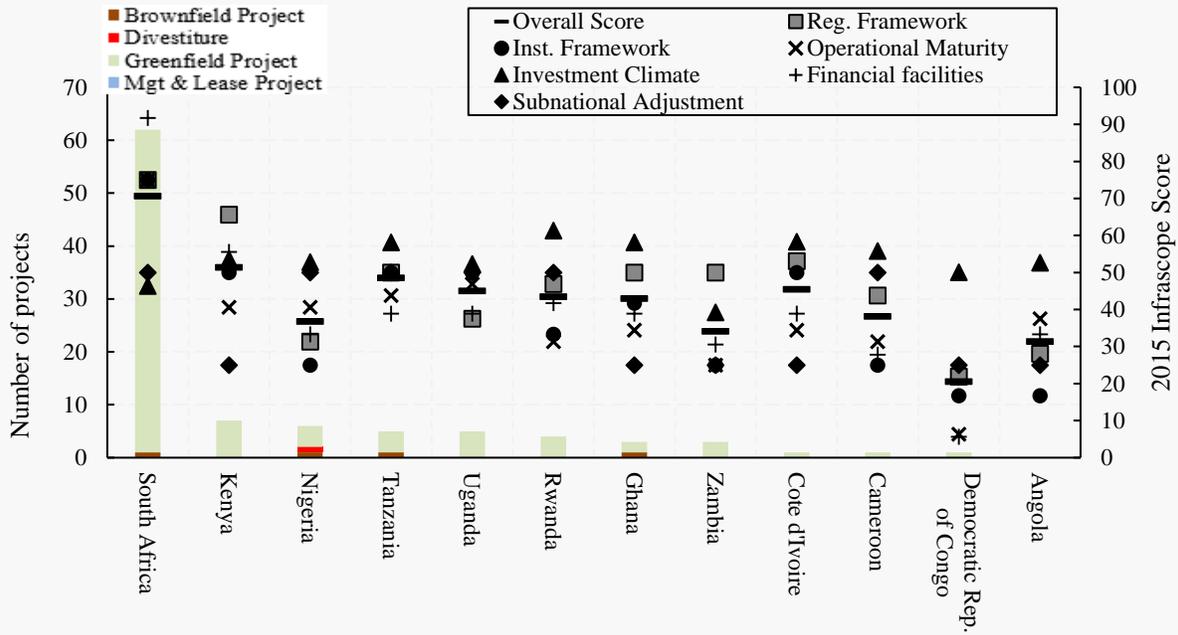
Figure 4. Total number of projects reaching financial closure from 2011 to 2015 and the 2015 Infrascope scores for SSA countries

investor confidence in the region but it is As is the case in emerging markets, the banking sector and other long term investors such as pension funds are still developing making the mobilization of local financing for projects difficult. Since the bulk of financing is usually secured from outside sources, the resulting currency mismatch between the financing and future cash flows may cause concern for potential investors (Ehlers, 2014; Adarkwa & Radovic, 2016). Efficient risk allocation remains a pillar of successful public-private partnerships and so when governments are unwilling to take on part of the demand risk for projects, investors may perceive this as a sign of a lack of political will. This reduces investor's confidence. Governments in the region may find it difficult to provide guarantees for these types of risks and this also affects deal flow significantly.

Figure 5. Correlation plot between total number of projects reaching financial closure and 2015 Infrascope scores for Sub-Saharan African countries *(Overall= Overall Infrascope Score; Reg_frm=Regulatory Framework; Inst_frm= Institutional Framework; Op_mat=Operational Maturity; Inv_cl=Investment climate; Fin_fac=financial facilities; Sub_adj=subnational adjustment; Total_fin_cls=total number of projects reaching financial closure from 2011 to 2015)*
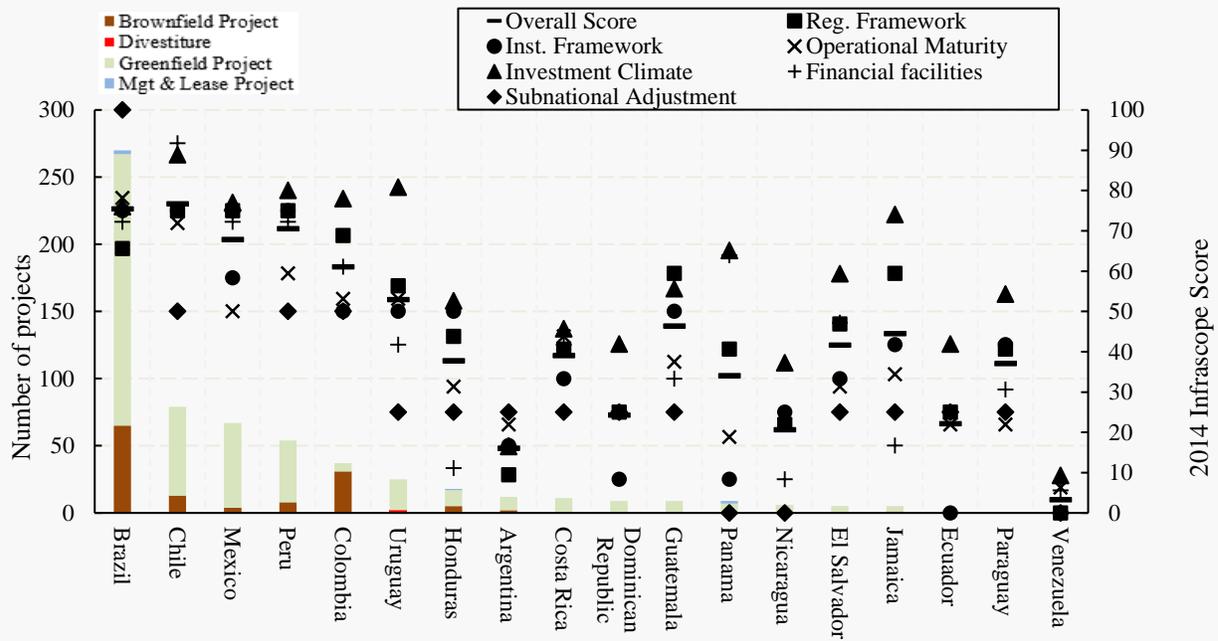
Figure 6. Total number of projects reaching financial closure in the Latin America & Caribbean region from 2011 to 2015 and the 2014 Infrascope Scores

2.2 Latin America & Caribbean

Countries in the Latin American & Caribbean that had 2014 Infrascope Scores and data in the PPI database were considered in this study. Brazil led the region with 270 projects reaching financial closure from 2011 to 2015. Other active countries in the region were Chile, Mexico, Peru and Colombia which recorded 79, 67, 54 and 37 projects reaching financial closure respectively (Figure 6). Similar to the SSA, greenfield projects dominate the overall financial landscape, with Columbia being the exception. Unlike the other countries from this region, brownfield projects were dominant in Columbia accounting for more than 80% of all projects reaching financial closure.

Despite Brazil having the highest number of projects, Chile had the highest overall Infrascope score of 76.6 (Figure 6). This may

have been due to country's increased need for infrastructure as a result of hosting the World Cup and the Olympics, two major sporting events with a very short time interval between them. In addition, Chile also had the highest score for the financial facilities category in the region. The top 5 countries in terms of the number of projects reaching financial close in the region all had correlation of 0.85 is detected between the total number of projects reaching financial closure and the subnational adjustment factor (Figure 7). Another factor which was also highly correlated with the total number of projects reaching financial closure in Latin America was operational maturity with a value of 0.75.subnational adjustment scores of 50 and above (Figure 6). Furthermore, a high correlation of 0.85 is detected between the total number of projects reaching
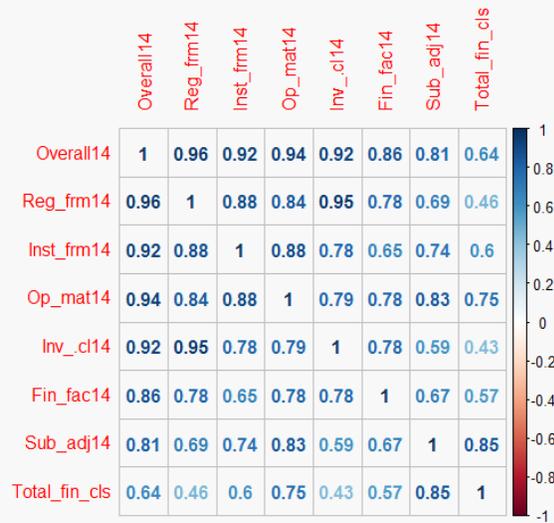
Figure 7. Correlation plot between total number of projects reaching financial closure and 2015 Infrascope scores for Latin America & Caribbean region *(Overall= Overall Infrascope Score; Reg_frm=Regulatory Framework; Inst_frm= Institutional Framework; Op_mat=Operational Maturity; Inv_cl=Investment climate; Fin_fac=financial facilities; Sub_adj=subnational adjustment; Total_fin_cls=total number of projects reaching financial closure from 2011 to 2015)*

financial closure and the subnational adjustment factor (Figure 7). Another factor which was also highly correlated with the total number of projects reaching financial closure in Latin America was operational maturity with a value of 0.75.

3.0 Summary of findings for the regions

In spite of their similar average Infrascope scores, LAC and SSA differ significantly when a detailed look at the scores are taken into consideration. While the financial facilities score is highly correlated with the total number of projects reaching financial closure between 2011 and 2015 in SSA, subnational adjustment factor is the most highly correlated factor with number of projects in LAC. Countries with high scores for the subnational adjustment indicator typically have well-developed concession

programs at the local or subnational levels. Four of the top five countries in the LAC region which are most prepared for private infrastructure projects; Brazil, Mexico, Colombia and Peru all have regulations that allow for subnational concessions (EIU, 2014(i)). The ability of countries to undertake projects with private participation at the local level is a good indicator of the government's support for such projects as well as its operational maturity. In SSA, the lack of financial facilities in addition to political instability further increases the general perception of risk in the region and the high correlation with the total number of projects corroborates this assumption.

The second most highly correlated factor with total number of projects in both regions was operational maturity. An explanation for this trend is that increased private sector participation is the result of investors' increasing confidence based on the successful track records of these countries. Also, governments which have worked in the past with private parties are likely to have the institutional capacity and expertise to support such contractual agreements. It must be noted that the operational maturity score is calculated based on the distress rates for projects in countries using the PPI database. This study uses number of projects reaching financial close in the same database over the last five years before 2016.

3.1 Conclusion & Recommendations

These correlation plots for total number of projects reaching financial closure and the Infrascope scores gives an indication of how private participation in infrastructure development is related to various factors at play in both the Latin American and Sub-Saharan African markets.

In Sub-Saharan Africa, the financial facility factor was most highly correlated with the total number of projects which reached financial closure from 2011 to 2015. This is a very important finding for decision makers in the region. In order to boost private investment in infrastructure in the region, governments may have to focus on improving on local capital markets. Pensions and insurance in Sub-Saharan African countries must be reformed to have the capacity to invest in local infrastructure projects. In addition, governments must also provide alternative forms of guarantees in contract agreements to boost investors' confidence.

For Latin America and Caribbean, the subnational adjustment factor and operational maturity had the highest correlations with total number of projects. The reason for this trend is that there seems to be more activity at the subnational level which introduces a diverse set of risks into the development of projects. The top five nations in the region based on total number of projects between 2011 and 2015 all had subnational adjustment scores greater than or equal to 50. A typical example of such risk may involve private partners being unable to work with local governments which do not have the capacity to undertake large and complex projects. Local governments also have lower credit ratings compared to federal governments and this may also hamper the mobilization of investment funds.

Future research will focus on studying the relationships between changes in scores and the corresponding changes in project outcomes. This approach will also be extended to other regions such as the East Asia & Pacific. A look at the relationships between the scores and project numbers in developed (high-income) economies will also provide valuable insight for such markets.

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