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Master's Thesis of Graduate School of International Studies

Determinants of Infrastructure Public-  
Private Partnership of Latin America

중남미 인프라 민관협력의 결정요인에 관한 연구

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Graduate School of International Studies

Seoul National University

International Area Studies Major

Yoonji Song

# Abstract

Public-Private Partnership has been getting more and more popularity especially in developing countries recently, as an alternative way of financing for infrastructure provision. Latin America has conducted a fine performance in general, but the success is quite limited to only few countries and the factors that make this difference have been underdeveloped. This paper examines such a question, focusing on institutional factor and legal system of Latin American context. Findings show that the large market size, stable macroeconomic environments and quality governance with efficient legal system and stable regime lead to more PPP in Latin America including the most recent data, similar to examined in the existing literatures. But it is found that not only the host country's conditions as a investment destination but the initiative interpreted from an agency dedicated to PPP or special law regarding PPP the country takes also matter to a great deal.

Keyword: PPP, Latin America, Infrastructure, determinants of PPP

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## **I. Introduction**

A country's economic development requires capital stock as its driving force. But since it is not easy for the developing countries to procure the needed resource on its own, finding an alternative way of getting resource has been a key role for the developing countries' policy decision makers. As a developing country is normally lack of financial source inside the country, a capital inflow from the outside of the country is required, such as ODA, FDI, or trade.

Among all, Official Development Assistance, which is the most commonly used term defined by OECD, has been one of the primary financing source of developing countries' economic development, lessening the gap between what they can draw from tax and what they need. However, ODA sometimes is not a 'free money'. The donation is decided not by the recipient's need, but by the donor's purpose or strategy. While some region is crowded with various donors, others are not able to get the same level of support. On the other hand, donors also impose conditionality in accordance with the donor country or organization's policy which in some cases can be a harsh burden for the developing country to meet and thus lead the country to avoid getting ODA. Furthermore, when a developing country reaches certain level of economic development, the country might get more attention as a development partner but with less favorable lending condition, according to the donor's policy when it is 'in-need' base. For example, many Latin American countries have become upper middle to high income country throughout the history, which made them difficult to get ODA as before and it led the region's ODA

commitment ratio of whole region from 11% in 1995 to 3% in 2018.<sup>1</sup>

There are also other types of capital inflow that can support the countries' development, such as private investment or trade. Foreign Direct Investment, in this case, is a very attractive option for the developing countries not only because of the capital they can draw into the country, but they also can absorb the effect of technology which is transferred alongside the investment thus achieve productivity improvement. But in many cases, the developing countries face diverse constraints in attracting the needed capital inflow through investment starting from market related factors such as small size of GDP, volatile economic environment which is heavily dependent on the global primary commodity's price, followed by policy or political issues like unstable currency, lack of quality institution, political conflict or insurgency, to name a few. On the other hand, even though the country becomes richer than before, it is not an easy quest to raise tax rate which has been long held in certain level. Increasing tax rate could face severe resist not only from the citizens as seen in the recent case from political protest in Chile triggered by the metro fare increase, but the corporations inclusive, deterring the investment as the cost rises.

On the other hand, among all types of national projects implemented for a country's economic development, it is well known and broadly accepted that the installation of physical infrastructure such as roads, railways, ports and airports, performs an important role in stepping up to the take-off stage of economic growth (W. W. Rostow, 1959).

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<sup>1</sup> Source: OECD CRS (search data: 2019.10.17)

Albeit there rarely exist arguments on the role and necessity of physical infrastructure as a social overhead capital which is essential for the country's development, at the same time building roads or energy plants requires a huge amount of money. But at the same time many developing countries suffer from government budget constraint while the government budget is normally the only or at least main source for the provision of infrastructure. Furthermore, the formation of a social overhead capital is very much costly in the view of not only financing but inclusive technology and experience. And even if they manage to get the fund from aid, inconsistency in the donor's aid commitments is another type of hardship that developing countries experience when designing and implementing its own national development plan. That is one of the reasons that as developing countries becoming more and more developed, they seek ways of diversifying financial resource by attracting foreign direct investment or by trade to break away from the hard dependence on the aid from donors.

From this background, public-private partnership (PPP) has started to get attention from decision makers in governments. One of the most evident benefit from PPP is that it can loosen government budget constraint. However, even the developed countries' governments who relatively are in a better position of budget are fond of this type of project arrangement which means there are other kind of advantage that expected to be generated by PPP, for example, improvement of efficiency in public sector by introducing private sector.

There are numerous types of private participation in public projects, in this paper, the

definition from the World Bank's PPP Knowledge Lab is used. It basically includes projects with long-term contract regarding infrastructure provision between private and public party in which some part of the project function and risk is transferred to the private. PPP acquired more and more importance in recent global governance. PPP became more and more popular reaching its investment amount to US\$ 160 billion in 2012, and even decreasing in 2018, the amount recorded US\$100 billion, still high number, which corresponds to more than 8% of FDI of the same year.<sup>2</sup>

If we look into the Latin America and Caribbean region, it can be observed that the region has focused on PPP from its early stage in 1990s, the earliest among the developing countries, recording by average 30% to 40% of the investment the whole world gets. But the high amount come from very limited number of countries such as Brazil, Mexico and Colombia.

Meanwhile, Latin America has been called as 'the land of opportunity' for a long time at the same time long been expected to leap up at any point when provided proper investment, however, almost every country in the region still remains in the so-called middle-income trap, which is why the nickname sometimes changes as the land of opportunity 'that never comes'. Latin America and Caribbean is a region with huge potential for the economic development possessing vast territory, rich natural resources and historical legacy, but the region consists of mostly middle-income countries with average GDP per capita of US\$ 9,000, still not reaching the world's average

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<sup>2</sup> Source: World Bank (search date: 2019.10.18)

US\$ 11,000.<sup>3</sup>

So, the purpose of this paper is to analyze determinants of PPP type projects in Latin America and Caribbean and possibly to suggest policy implication for the countries' governments to enable broader application of the method and thus provide the region sufficient level of infrastructure to be a toehold for the region's development. Accordingly, the empirical research is conducted using variables from the existing literatures, applying them to the Latin American case including the most recent dataset available. Additionally, some qualitative aspects of PPP in the exemplary case countries like Brazil, Mexico, Colombia, etc. is dealt with, to better find out real determinants of PPP through experience in practice.

This paper comprises six sections including this introduction. The second chapter is a literature review on the determinants of PPPs and the third chapter deals with the PPP trend of Latin American region. And in the fourth chapter the data and methodology is presented, and then the result will be provided. At last, in the fifth chapter conclude the paper.

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<sup>3</sup> Source: World Bank World Development Indicator (search date: 2019.10.17)

## **II. Background**

### **1. Infrastructure and Economic Growth**

It is broadly studied and accepted fact that infrastructure is critical for a country's economic growth and its long-term development.(Estache et al., 2005) Infrastructure construction creates employment, increase market accessibility and improve health and education through better connectivity and sanitation function (Calderón and Servén, 2010) thereby contribute to sustainable growth and quality of life through a better access to service when it is appropriately designed and implemented as planned.

However, in reality, despite of the urgency and the importance of infrastructure provision in developing countries, there is huge gap between the necessity and actual infrastructure implementation due to chronic budget constraint. According to Ruiz-Nuñez and Wei (2015), developing countries would need to invest US\$ 836 billion per year or 6% of current GDP during 5 years to meet the new infrastructure demand and maintain the service level of existing assets.

From this background, various way of financing as an alternative has been tried, among all there is Public-Private Partnership. Although government's budget constraint is not the only reason for seeking PPP in infrastructure provision, it is evident that for developing countries, one of the most important motivation is attraction of private capital into public sector where there is resource limitation.

## 2. Public-Private Partnership

### 2-1. Definition of Public-Private Partnership

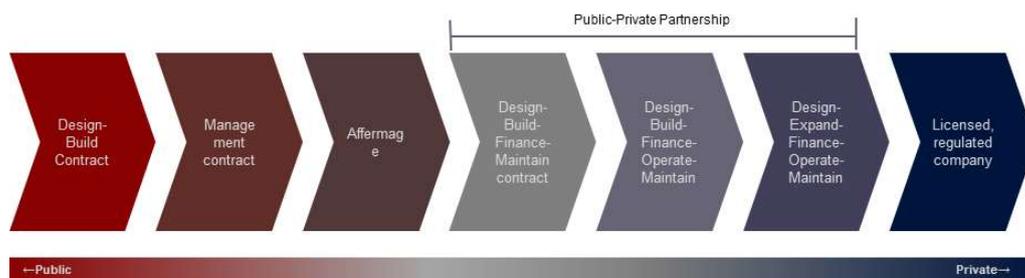
There is no uniformly accepted consensus about definition of PPP which might cover all concepts and functions that PPP type projects bear. The PPP knowledge lab defines PPP as ‘a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance’. OECD definition is more sector specific, focusing on provision of infrastructure. It defines PPP as ‘arrangements whereby the private sector provides infrastructure assets and services that traditionally have been provided by government, such as hospitals, schools, prisons, roads, bridges, tunnels, railways, and water and sanitation plants. There are governments who define PPP in their related policy or law to draw a line for the specific conditions for PPP. For example, Brazilian law excludes user-pay projects which are considered as concession projects and ruled by Concession Law. In case of the United Kingdom, government-pays PPPs for new assets are called as ‘Private Finance Initiative (PFI)’ and PPPs for the existing facilities are distinguished from it.

Lastly, Private Participation in Infrastructure (PPI) defines PPP as public infrastructure projects where private investment is arranged by contract, sharing cost and risk between the public and the private. There is no critical difference among those definitions from different organizations or country, in spite of minor specifications. The most commonly accepted definitions include contents as infrastructure projects, cooperation between the

public and the private, sharing risks possibly occur in the projects. In this paper, the definition of PPI database of the World Bank will be used since the data used in the analysis of this paper comes from the PPI.

Even among PPP projects, there exist various types of PPP according to extent to which the private investor is involved. Below are few examples of the types of PPP ordered by the extent of private participation.

**Figure 1. PPP Contract Types**



Source: Author's work based on Reference Guide, PPP Knowledge lab, WB (Search date: 2019.10.22.)

Traditionally, the public sector was the main actor in infrastructure investment due to its inherent nature as public goods. However, it was the last century when the first discussion on private participation in public sector was introduced with the idea of New Public Management. The idea was that since government and public organizations can always be saved from the failure unlike market, they are naturally inefficient which is why even in public service the competition pressure should be applied. (Leibenstein, 1966) At that time the most advanced countries including the UK, Australia and the USA started to implement PPP. Recently PPP is being more and more popular not only by

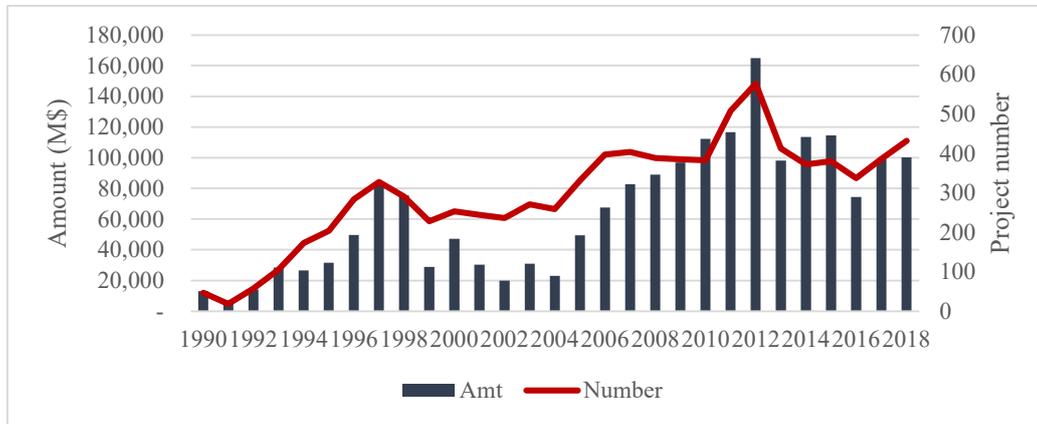
each government but also in the global society aiming for the development such as multilateral organizations such as the World Bank, OECD, IMF, etc. who mostly play a role of a supporter. PPP has been conducted and studied with the argument that PPP can improve the efficiency of public service and offer better quality service and thereby could bring about the positive financial effect. (Harris et al., 2003)

Today, there is certain level of consensus why governments seek PPP type projects. First, PPP can contribute to overcome government budget constraint (Hammami et al. 1999) which mostly can be applied to the case of developing countries' highly indebted governments who experience fiscal vulnerabilities, unstable currency issue, etc. (Arezki and Ferid, 2019; World Bank, 2017) Second, PPP can bring about efficiency in the public sector by introducing the private sector's competitiveness. (Yescombe, 2007) As mentioned earlier, from the 'value for money' point of view, PPP has been implemented from the advanced countries. Adding one more reason, PPP also has advantage similar to FDI, since it assumes the private participation, normally well-experienced. Thus, technology transfer can happen when a developing country conducts a PPP project with the private corporation with expertise in construction, operation and payment system, etc. And the experience of cooperation with the private sector can become a very useful resource for the government of developing country for attraction of future investment. And for the private sector also it is a good practice in entering the emerging market with at least certain level of guarantee from the government itself thus providing the experience mutually for the future investment.

## 2-2. PPP in Infrastructure

The World Bank's PPI (Private Participation in Infrastructure) database which is the most comprehensive and credible source regarding PPP contains data from 1984 to actual year 2019. And the database records only from low to middle income countries' investment, in other words, developing countries. According to the mentioned database, PPP projects started to be active since early 1990s and it shows a very rapid growth within almost a decade, reaching to the peak of US\$ 80 billion. Then it declined from the late 1990s and hit the lowest in 2002 with almost the same amount as early 1990s, and then slowly recovered previous level since 2005. The rapid growth tendency has been maintained till 2010s, as it hits the ceiling in 2012 with the highest in record year with investment amount of US\$ 160 billion. Later it decreased to the previous level as US\$ 100 billion and keeps that level during recent 5 years. The number of projects also shows similar trend, having slightly smaller deviations than investment amount and show stabilized level of 400 projects per year during last 10 years.

**Figure 2. PPP Projects trend (1990-2018)**



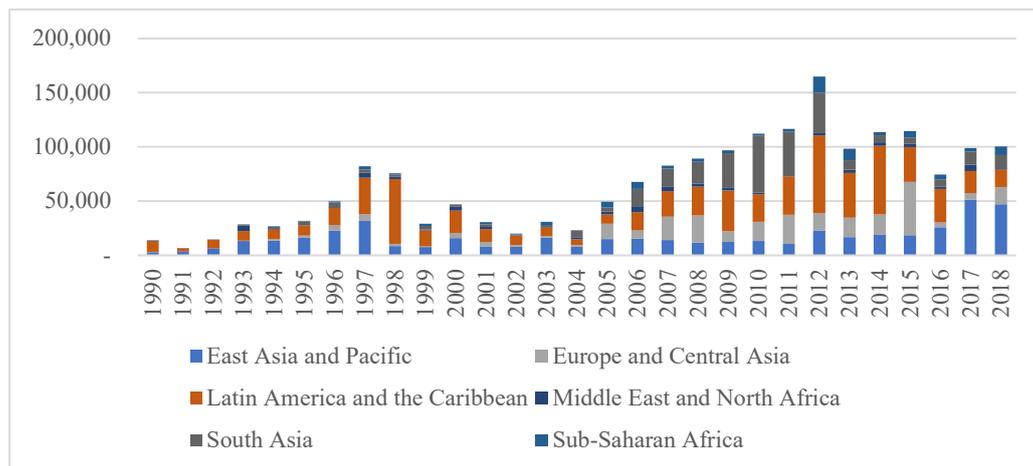
Source: WB PPI Database (Search date: 2019. 9. 26)

It seems that PPP has grown during last three decades which is totaled almost US\$ 1.9 trillion, annual average as US\$ 65 billion, but in comparison to the infrastructure-investment needs of US\$ 800 billion estimated by the World Bank (2017), is still remaining at a very underdeveloped level.

As above mentioned, PPI database only deals with the data of developing countries, which is why Europe and Central Asia has smaller portion and North America does not appear in the dataset. Aside from that, PPP is relatively well distributed by continent. Throughout the whole time period, Latin America has shown the highest performance, recording at least 30% of total investment each year. Especially during the late 90s and around 2012, the region has reached its pick with 80% of total investment. South Asia has been active during the 2000s, while East Asia and Pacific has been lagged behind after the late 1990s' Asian economic crisis is rapidly increasing its share recently mainly

due to China's soaring investment.

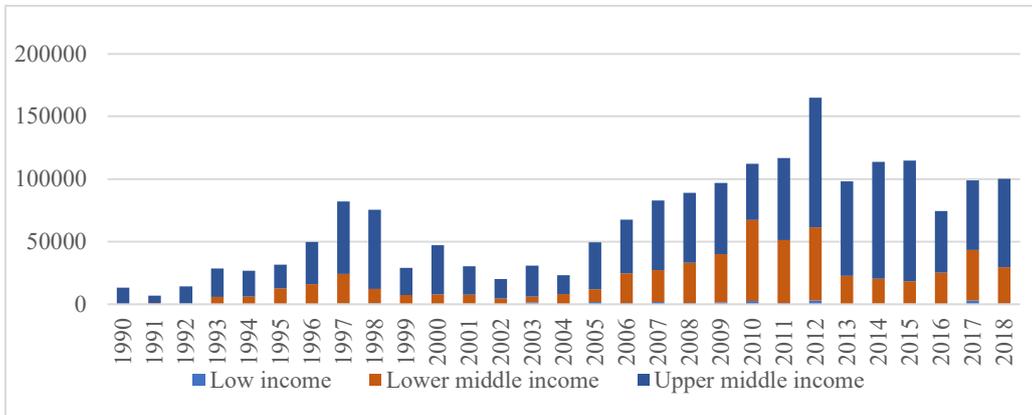
**Figure 3.** PPP investment by region (1990-2018)



Source: WB PPI Database (Search date: 2019. 9. 26)

Meanwhile, looking into the distribution of investment amount by host country's income level considering the database only covers low and middle income countries, at initial stage the focus was mainly on upper middle income countries and the majority of it has been maintained, while lower middle income countries' investment also has been growing up, surpassing the upper middle income countries in 2010.

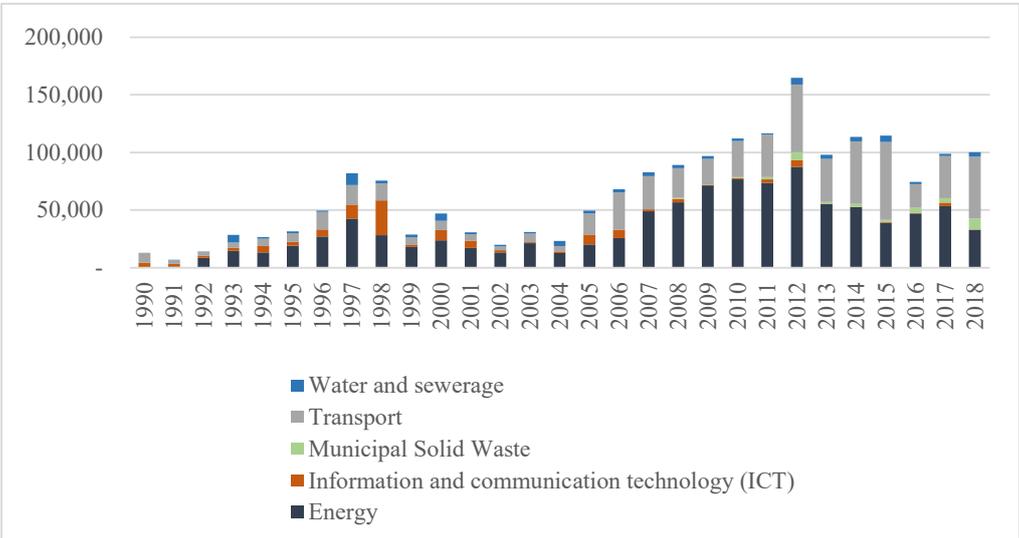
**Figure 4.** PPP investment by income level



Source: WB PPI Database (Search date: 2019. 9. 26)

Among the 5 primary sectors, energy and transport have been dominating for the whole time. ICT (Information and Communication Technology) had some portion with the highest invest in 1998, but it has shrunk after 2000. Considering PPP is more commonly conducted in middle-income countries instead of low-income countries as seen above, it seems that after 2000 the basic ICT projects such as telephone line system has already finished at that time and mobile phone or internet business has been implemented mainly by private sector.

**Figure 5.** PPP Investment by sector (1990-2018)



Source: WB PPI Database (Search date: 2019. 9. 26)

Throughout the whole period, the country who recorded the highest amounts of projects was Brazil, with annual average US\$ 14 billion, with a huge gap with the second, India, who is followed by China who shows steep increase recently. The first observation is that the countries who are in the top list are ‘big’ countries in terms of either population or GDP or land area or all of them. It might be understood as the nature of infrastructure which could create greater demand when the larger the population is, the bigger the land area is or the greater the country’s economy size is.

**Table 1.** Average of PPP Amount of Each Period (Unit: m\$)

	<b>COUNTRY</b>	<b>1990-1994</b>	<b>1995-1999</b>	<b>2000-2004</b>	<b>2005-2009</b>	<b>2010-2014</b>	<b>2015-2018</b>	<b>AVER AGE</b>	<b>TOTAL</b>
<b>1</b>	Brazil	127	16,251	5,840	15,692	35,215	9,962	13,982	405,470
<b>2</b>	India	443	2,093	2,405	16,052	27,269	6,175	9,173	266,012
<b>3</b>	China	2,300	6,595	5,599	7,272	5,863	17,664	7,200	208,801
<b>4</b>	Turkey	81	1,441	1,389	4,480	10,676	14,609	6,069	145,646
<b>5</b>	Mexico	2,047	1,705	1,754	3,035	4,573	5,609	3,035	88,008
<b>6</b>	Russia	346	1,071	536	6,027	5,273	2,643	2,732	76,492
<b>7</b>	Indonesia	544	3,139	345	1,027	2,202	7,806	2,399	67,160
<b>8</b>	Argentina	4,086	4,270	881	1,026	693	1,016	2,116	57,133
<b>9</b>	Philippines	743	3,329	856	2,245	1,275	3,352	1,919	55,646
<b>10</b>	Malaysia	3,494	1,954	3,043	790	885	1,255	1,870	52,357
<b>11</b>	Colombia	563	1,692	369	900	2,590	4,189	1,711	46,201
<b>12</b>	Thailand	1,406	1,793	1,077	1,469	1,965	2,262	1,676	43,582
<b>13</b>	Peru	1,051	622	541	1,039	2,757	2,808	1,466	38,127
<b>14</b>	Pakistan	1,044	1,539	493	1,312	926	2,463	1,390	27,807
<b>15</b>	S. Africa	317	427	593	1,757	1,956	3,148	1,475	26,542

Source: WB PPI Database (Search date: 2019.10.24)

This whole picture changes a lot if the unit is percentage of GDP. Lao PDR does a lot of PPP projects in terms of amount considering its total GDP. Some countries like Malaysia and Philippines are also included in this list as well as the total amount top list, meaning that their PPP attraction performance is absolutely and relatively good, even fixing the country's size impact.

**Table 2. PPP per GDP (% , Average of 1990-2018)**

	Country	PPP per GDP (%)
1	Lao PDR	8%
2	Gambia	2%
3	Djibouti	2%
4	Belize	2%
5	Bolivia	2%
6	Liberia	2%
7	Malaysia	2%
8	Togo	2%
9	Philippines	2%
10	Jordan	2%

Source: WB PPI Database (Search date: 2019.10.24)

### 2-3. Determinants of PPP from existing literature

PPP is mainly public sector business through which public good or service is provided, but at the same time it requires private investment by definition. Thus, it has common area partially with ODA which refers to mainly flows to governments, even some part of it includes multilateral development institutions as recipients. At the same time, since it premises private actor's investment, it has a overlaps with FDI also. Therefore, there are similarity in in the study of determinants also with the both capital flows, for example, macroeconomic situation, political environments, institution level, etc. On the basis of this argument, many studies after the 90s has been conducted in regards to the PPP's determinants as follows.

**Table 3.** Determinants of PPP from Existing Literatures

<b>Determinants</b>	<b>Logic</b>	<b>Source</b>
Government's budget constraint	Governments with harsh budget constraint have higher motivation for PPP.	Karsi and Wibowo (2015), Hammami et al. (1999)
Market condition	Bigger market and larger purchasing power attract more PPP due to higher expectation on return.	Sharma (2011), Karsi and Wibowo (2015)
Macroeconomic stability	Stable economy where price and currency are more stable can attract more PPP due to lower risk.	Benerjee et al. (2006), Hammami et al. (2006)
Political stability	Stable regime and absence of politically related violence lead to more investment.	Sharma (2011), Reside and Mendoza (2010)
Regulation	Transparent and sound regulation increase private investment.	Ponsiri (2002), OECD(2014)
Government's ideology	Left governments tend to be lack of autonomy and accountability.	Estache (2006)
Corruption	Corruption crowds out sound investor and lowers return from PPP.	Di Liddo (2019), kenny (2006)
Government effectiveness	Private sector invests more where the administration is more efficient.	Lee and Kim (2014)
Rule of law	Government's enforceability upon contract fulfillment enhance PPP.	Allen and Overy (2009)
Institution	Good institution attracts more PPP.	Hammami et al. (2006)

Source: Author's work based on literatures mentioned in the table

Various determinants above introduced can be roughly categorized into three. The first is government's budget related matter. A government highly indebted or who do not hold natural resource which can be transferred into one of the most important government's financing method must seek for alternatives to provide infrastructure, and PPP can be a good option in this case. Secondly, when the market condition is attractive to the investors and macroeconomic environment is stable, more PPP can be realized. Larger population and land, higher purchasing power which are the signs of market size is

directly related to higher infrastructure demand. Especially in case of PPP, purchasing power assumed by GDP per capita also matters not only the total GDP size, as disposable income increases the demand for road, energy, water and sewerage and communication increases which can be interpreted as a condition for higher profitability. At the same time, not only size but also the stability of macroeconomics influences the decision on investment. When the range of fluctuation on price or exchange rate is extremely high, investors experience difficulty in profitability prediction and it is led to the increase in investment risk. Third, a good number of studies have revealed that political environment and government related aspects have influence on PPP. In PPP scheme, as the government of host country is the counter party that the private sector make contract with, political stability such as if the regime will be threaten by other political powers in the country or surrender to the pressure to change the policy within the contract term matters much in making decision of investment. On the other hand, the government's administrative capacity also matters. High quality regulation which does not infringe property right with high capability of well experienced government staff also attract more investment.

Meanwhile, not all the governance indexes are expected to have a positive correlation. In a discussion regarding government effectiveness, it is commonly accepted that a more effective government would attract more PPP, however, unlike normal investment, PPP is conducted by public sector to provide with the public service to the people of the country. A government with high effectiveness can conduct large amount and long term infrastructure contract and construction by itself effectively instead of drawing private

sector to the public sector, it is possible that in case the government who has institution level high enough might prefer to conduct infrastructure provision by its own to involving private actor in the process which makes the process more complicated. (Sharma, 2011)

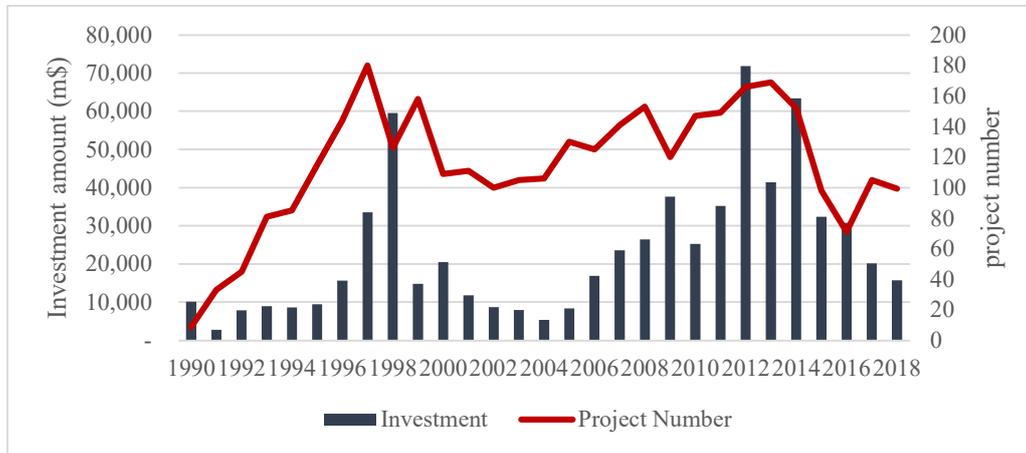
There are various analyses conducted regarding PPP's determinants on specific region of the host country, Reside and Medoza (2010) conducted the research on Asian region, MENA (Middle East and North Africa) region by Di Liddo et al. (2019), Latin American region by Lee and Kim (2014), and Karsi and Wibowo (2015) conducted research on Muslim countries, mainly MENA region but including some South Asia countries. Even though there are difference in the target group, but the variables used to find the determinants do not vary much.

### **III. Latin America and Caribbean and PPP**

As shown in the previous chapter, Latin America and Caribbean region is where PPP projects are most actively conducted, taking from 40% to 60% of share in almost every year since 1990. Recently the strong trend has slowed down, yielding the largest share to the East Asia and Pacific, mainly contributed by China's active participation in PPP.

The region shows similar trend as the world's trend during the same period, only with a bigger fluctuation. Its investment both in terms of amount and project number touched the ceiling in late 1990s, right before the region's biggest countries are hit by massive economic crises, starting from Brazil in 1999 and Argentina's debt crisis in 2002. It can be interpreted that throughout the crises in the region, macroeconomic condition got worse and government's administration got instable with frequent changes in institutions and regulations which had a bad impact on the PPP environment. After, PPP trend kept the slow movement in terms of invested amount during the early 2000s, while the number of projects has been maintained relatively at stable level, above 100 cases per year. Later the region started recover the upturn, reaching to its highest ever amount in 2012 with more than US\$ 70 billion. Recently it has slowed and in the most recent year it recorded only 20% of the investment among all developing countries.

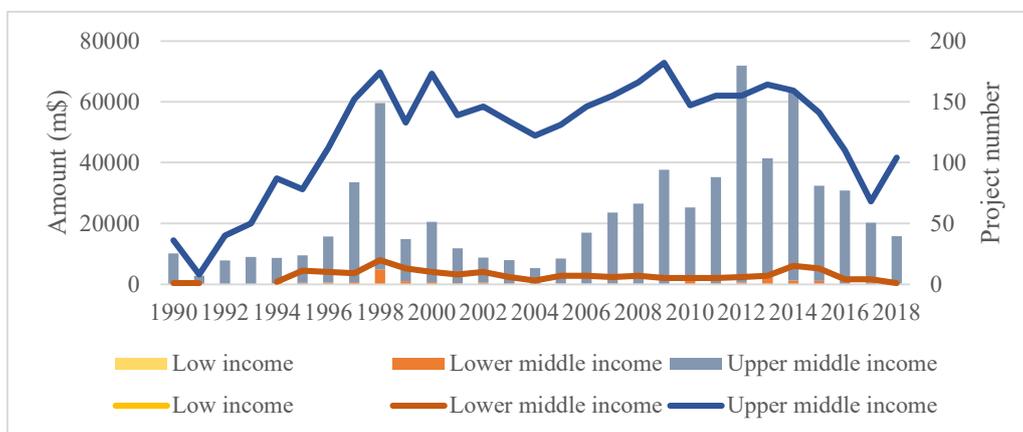
**Figure 6.** PPP Investment and Project Numbers of Latin America and Caribbean (1990-2018)



Source: WB PPI Database (Search date: 2019.10.24)

In terms of distribution by income, as the database from WB PPI only deals with the cases of low and middle countries and it is highly concentrated in middle income countries as observed in the previous chapter, Latin America also has the same concentration in the middle-income countries. But there is huge difference in the composition, most of the investment both in terms of amount or project number is heavily concentrated in upper-middle income countries. Actually, this uneven distribution unlike the whole globe's trend which was 40:60 more or less comes from the country composition within the region and it will be shown further.

**Figure 7. PPP Investment and Project Number of LAC by Income (1990-2018)**



Source: WB PPI Database (Search date: 2019.10.24)

Note: bar for project amount, line for project number

Latin America and Caribbean region, (LAC or Latin America from here) has a high concentration in top five countries, occupying 96% of total investment in the region. Even among them, Brazil has the absolutely high share all time long. It means that PPP of Latin American region is led by the top 5 countries, namely Brazil, Mexico, Argentina, Colombia and Peru, including those who have more than 5% share in total in the whole period.<sup>4</sup>

Brazil has conducted the highest amount of PPP in the world, with US\$ 17.2 billion as average of recent five years from 2014 to 2018. Including Brazil, all top five countries in LAC are upper middle-income countries which is why the PPP amount by income is

<sup>4</sup> Chile, one of the countries whose PPP performance is the most active in the region, has excluded in the list from 2012. Panama and Uruguay also are excluded as now, from 2017, 2012 respectively. Argentina has been included in the total list of 2019 version but in some years its position has changed repeatedly.)

extremely concentrated in this income group.

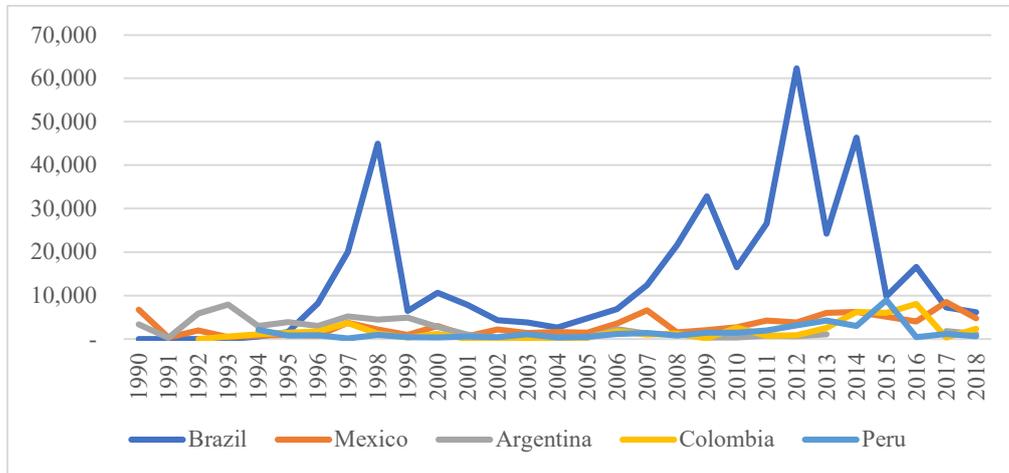
**Table 4. PPP Investment of LAC countries by period (1990-2018)**

		<b>1990- 1999</b>	<b>%</b>	<b>2000- 2009</b>	<b>%</b>	<b>2010- 2018</b>	<b>%</b>	<b>Average</b>	<b>%</b>
1	Brazil	16,378	44%	21,531	61%	45,177	61%	13,982	60%
2	Mexico	3,752	10%	4,790	14%	10,182	14%	3,035	13%
3	Argentina	8,356	23%	1,907	5%	1,708	2%	2,116	9%
4	Colombia	2,255	6%	1,269	4%	6,779	9%	1,711	7%
5	Peru	1,673	5%	1,580	5%	5,565	8%	1,466	6%
6	Bolivia	721	2%	231	1%	-	0%	335	1%
7	Ecuador	251	1%	801	2%	616	1%	329	1%
8	Dominican Rep.	414	1%	872	2%	366	0%	303	1%
9	Guatemala	546	1%	135	0%	578	1%	285	1%
10	Honduras	104	0%	259	1%	992	1%	282	1%
11	Venezuela	1,160	3%	47	0%	-	0%	272	1%
12	Jamaica	319	1%	333	1%	635	1%	258	1%
13	Cuba	268	1%	418	1%	-	0%	187	1%
14	El Salvador	317	1%	170	0%	169	0%	178	1%
15	Costa Rica	70	0%	312	1%	711	1%	167	1%
16	Nicaragua	77	0%	199	1%	514	1%	144	1%
17	Paraguay	58	0%	-	0%	-	0%	58	0%
18	Belize	77	0%	104	0%	22	0%	45	0%
19	Guyana	67	0%	-	0%	-	0%	33	0%
20	Haiti	3	0%	64	0%	57	0%	25	0%
21	Dominica	13	0%	-	0%	-	0%	13	0%
22	St. Lucia	-	0%	22	0%	20	0%	12	0%
23	Grenada	6	0%	8	0%	-	0%	6	0%
	<b>Total</b>	<b>36,885</b>		<b>35,050</b>		<b>74,092</b>		<b>23,271</b>	

Source: WB PPI database (Search date: 2019.10.24)

It is even clearer that Brazil takes the lead of PPP in the region, it is not an exaggeration that Brazil alone makes the trend of LAC, where other countries even major five ones shows a flat tendency in investment amount and are far from the extent to which can affect the whole trend of the region.

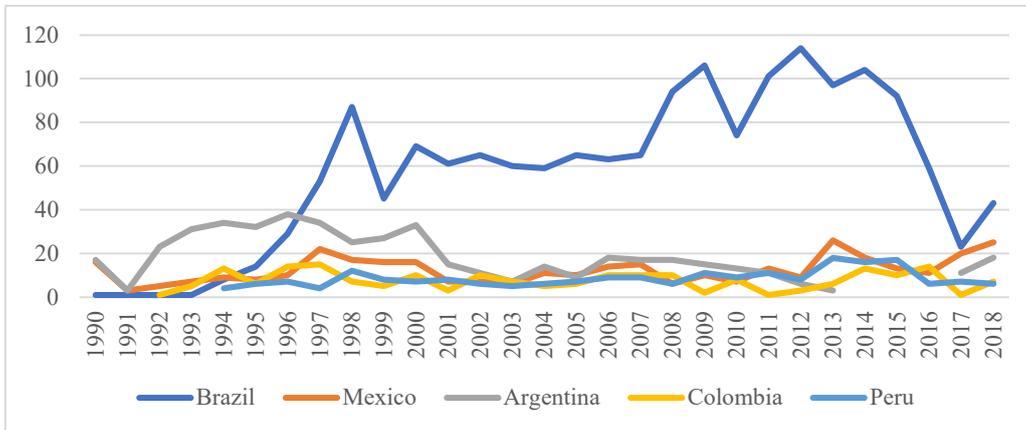
**Figure 8.** PPP Investment of LAC 5 countries (1990-2018, Unit: M\$)



Source: WB PPI database (Search date: 2019.10.24)

Project number data shows similar trend, but with little difference in fluctuation. It seems that Brazil has maintained high number of projects even in the early 2000s when Brazil was hit by massive economic crisis meaning that Brazil has conducted even small amount, but various projects. The case of Argentina is similar, in the 1990s it has conducted its record high number of projects reaching to 30 to 40 projects per year which were smaller in terms of scale.

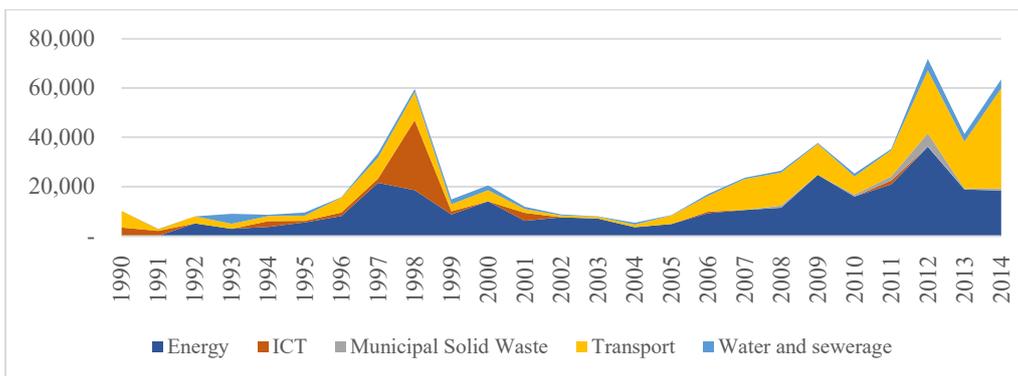
**Figure 9.** PPP Project Number of top 5 countries (1990-2018)



Source: WB PPI database (Search date: 2019.10.24)

PPP of Latin America is mainly divided into two sectors, which are Energy and Transport, except for the year 1998. It seems that in case of Latin America, basic ICT like telephone fixed line has already installed before 1900s, and additional communication sector business such as internet service was mainly conducted by private investors such as big operators of the region.

**Figure 10.** PPP investment of LAC by sector (1990-2018, Unit: M\$)



Source: WB PPI database (Search date: 2019.10.24)

As shown above, Latin America has conducted PPP projects actively during the whole period of observation. For better performance in infrastructure, 22 countries in the region have issued national infrastructure plans that defines prioritized sectors and guide for long term investment. 9 countries also prioritize PPP in the national infrastructure plans. In the region, 16 countries have PPP agencies dedicated for the function which shows the activeness of the region regarding PPP. However, just half of them have dedicated full-time staff in the agencies. In 5 of the rest 8 countries, the staffs are being borrowed from other departments of governments as ad-hoc type. It shows the lack of finance and institutional structure for PPP in the region which means the region still lacks of mature environment for PPP although the region has put a lot of effort for attracting PPPs and thereby a study for structural improvement is required.

## iv. Methodology and Empirical Analysis

### 1. Data and Methodology

In this chapter, determinants of infrastructure PPP in Latin American region are analyzed in accordance with the determinants tested in the existing literatures, to see if the economic, political and administrative factors are applicable also in the region including the most recent data up to 2018.

Below is a summary of determinants that will be used in this chapter for the empirical analysis. As briefly introduced in the previous chapter, PPP investment amount and project number will be dependent variables and as independent variables, three types of determinants namely government's budget, market environment and government's capacity, will be used for the analysis. It is expected that the harsher the government's budget constraint is, the larger the market is and the more stable the macroeconomic environment is, and lastly the better the government's administrative and institution quality is it is more likely to have more investment of PPP.

**Table 5.** Variables used in the Analysis

Dependent Variables					
Category	Variable	Definition	Unit	Data source	Relationship
PPP project number	PPPnumna	number of PPP projects	count number	PPI	
PPP Investment	PPPamt	Amounts of PPP investments, including projects without information as "0"	m\$	PPI	
Independent Variable					

Category	Variable	Definition	Unit	Data source	Relationship
Government Budget Constraint	Ex_Debt	External Debt	% of GNI	WDI	positive
	Fuel_Ex	Fuel export	% of merchandise exports	WDI	negative
	InODA	Official development Aid, commitment		OECD	negative
Market conditions	lnGDPpc	GDP per capita	PPP constant or US\$ per population, logged	WDI	positive
	lnPOP	Population	count number, logged	WDI	positive
	GDPgr	GDP growth rate	annual%	WDI	positive
	Infla	Inflation, GDP deflator	annual%,	WDI	negative
	exrate	Official exchange rate, LCU per US\$	annual%, exchange rate: t-(t-1)	WDI	negative
	Money	broad money	% of GDP	WDI	negative
Government's capacity	Gov_Effect	Government effectiveness	Index number, -2.5 < I < 2.5	WGI	positive
	Reg_Qual	Regulation Quality	Index number, -2.5 < I < 2.5	WGI	positive
	Ruleoflaw	Rule of law	Index number, -2.5 < I < 2.5	WGI	positive
	Cont_cor	Control of Corruption	Index number, -2.5 < I < 2.5	WGI	positive
	Pol_Stab	Political stability and absence of violence related to terrorism	Index number, -2.5 < I < 2.5	WGI	positive

Source: Author work based on existing literatures

The data used for analysis of PPP projects are the World Bank's PPI database, which is considered as the most comprehensive and accurate database regarding developing countries' PPP projects. Data from the year 1990 to 2018 which is the most recent data available as a unit of whole year is used in this paper.

In regards to the government's budget constraint, total external debt stocks to gross national income (%) from WDI (World Development Indicator), fuel export amount to

all merchandise exports (%) also from WDI, and ODA commitment amount from OECD (US\$, million) will be used. It is expected that with higher debt ratio, low income from natural resource export and less ODA the government will have less disposable financial resource for infrastructure implementation.

In regards to the market environment and macroeconomic conditions, variables used for normal Gravity model are used. High GDP per capita and population will be led to higher demand for infrastructure, and high economic growth rate and stable price level and currency level will lead to more investment. Abundant broad money is used as a sign of easiness for financing. All data here mentioned are from WDI.

Lastly to measure government's capacity, index from WGI (World Governance Indicator) based on the survey conducted in relation to the perception of each aspect will be used. Government effectiveness which measures perception on quality of government's public service and civil servant, independency from political pressure and trust on the policy. Regulation quality index shows the perception on formation and practical implementation on sound and effective regulation. Rule of law is used to show how legal system works in terms of enforceability on contract and property right protection. Control of corruption shows how government can control the corruption among elite group seeking private interest. Lastly political stability measures probability on stability of regime whether it is threatened by another political group within its territory or terrorist group which might cause massive violence. So, it is expected when the government is efficient and its regulation is clear and effective not deterring private investment, and

enforcement on breach of contract is well managed which is a common difficulty experienced in developing countries' business, and the government is powerful enough to prevent inefficient resource distribution brought by corruption, the country is in good condition for PPP investment.

For the analysis, GLS (Generalized Least Squared) regression where year is fixed is used with regional dummies where region1 is East Asia and Pacific, region2 is Europe and Central Asia, region3 is Latin America, region4 is Middle East and North Africa, region5 is South Asia and region6 is Sub-Saharan Africa. The setting of model means that the difference between years that are not included as variables are controlled such as world's economic crisis or general trend in increase or decrease in investment that changes year by year.

In summary, the basic formula that can be drawn is as below:

$$\begin{aligned}
 PPP\ amount = & \{b_1 \cdot gdppc + b_2 \cdot pop + b_3 \cdot Money + b_4 \cdot gdpgr + b_5 \cdot infla \\
 & + b_6 \cdot exrate\} + \{b_7 \cdot exdebt + b_8 \cdot fuelex + b_9 \cdot ODA\} \\
 & + \{b_{10} \cdot goveffec + b_{11} \cdot regqual + b_{12} \cdot ruleoflaw + b_{13} \\
 & \cdot contcorrup + b_{14} \cdot polstab\} + EAP + ECA + MENA + SA + SSA \\
 & + a
 \end{aligned}$$

In other word, PPP is determined by 1) economic environment, 2) budget constraint, 3) government's administrative capacity and 4) regional factors and each coefficient from  $b_1$  to  $b_{14}$  will show how strong is each factor's effect on PPP amount (or project

number in other cases).

## 2. Empirical Results

The results of empirical test are in the table 6 and 7, regarding PPP amount in the former and PPP project number in the latter. It supports general assumptions on determinants of PPP as studied in the previous literatures and as presumed in this paper. GDP per capita and population show the highest correlation with both the amount and number of PPP. It supports the idea that purchasing power in terms of income level and market size is one of the most important factors in making decision of PPP investment. Money supply also is a very significant, meaning financial liquidity has a very important role in infrastructure projects.

GDP growth rate has positive correlation with PPP investment and inflation and exchange rate deviation have negative correlation with PPP amount and project numbers but these seem less significant as determinants. This implies that expectation on higher economic growth and stable price level and currency compared to US dollar attract more PPP. It appears that generally those macroeconomic stability matter when deciding investment but not significant as expected.

Government budget constraints also seem to play an important role in deciding to conduct PPP or not. Debt ratio to GDP show positive correlation but not significant, fuel export's ratio to all merchandise export shows negative correlation and highly significant. It implies that governments who have limit in the budget available have higher

motivation to seek for other type of financial source for infrastructure. On the other hand, ODA seems to have positive correlation in terms of PPP amount but negative correlation with PPP project number, which is surprising. It seems that ODA amount can be interpreted as a sign of budget fluidity thereby when a country receive a lot of ODA there is little motive to get into many PPP projects which requires a lot of administrative work, but at the same time it has positive correlation with PPP amount since they share some similar characteristics as both are types of official capital inflow into the border. In other words, a country that is attractive in the world of ODA as a recipient also is popular as a host country of PPP projects especially in case of big projects which require huge amount of money.

Governance index show positive coefficient and broadly positive correlation, meaning more effective government function and efficient regulation and legal system with which property right is protected by the government, preventing corruption under the strong and stable regime will lead to more PPP investment. However, while regulation quality has a very high coefficient and significant with the amount of PPP, it has strongly negative correlation with project numbers, possibly implying that countries who conducts a lot of small amount of projects may have bad level of regulation quality and that did not stop them from signing various projects.

**Table 6.** Determinants of PPP investment amount

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	lnppp						

lngdppc	0.775*** (0.0453)	0.745*** (0.0475)	1.188*** (0.0758)	0.249*** (0.0390)	0.197*** (0.0380)	0.335*** (0.0365)	0.442*** (0.0351)
lnpop	0.881*** (0.0203)	0.884*** (0.0238)	0.890*** (0.0477)	0.869*** (0.0235)	0.908*** (0.0257)	0.981*** (0.0283)	0.949*** (0.0285)
money	0.0112*** (0.00152)	0.0146*** (0.00187)					
gdpg	0.0143 (0.00761)	0.0215* (0.00894)					
infla	-8.55e-05 (7.27e-05)						
exrate		-0.00627 (0.00438)					
ex_debt			0.000988 (0.000958)				
fuel_ex			-0.0138*** (0.00217)				
lnoda			0.352*** (0.0729)				
gov_effect				1.183*** (0.0948)			
reg_qual					0.986*** (0.126)		
ruleoflaw					0.454*** (0.129)		
cont_cor						1.030*** (0.112)	
pol_stab						0.0790 (0.0803)	0.459*** (0.0699)
region1	0.193 (0.140)	0.0172 (0.161)	0.235 (0.188)	0.0217 (0.160)	0.166 (0.166)	0.0692 (0.164)	-0.0831 (0.166)
region2	-0.708*** (0.138)	-0.796*** (0.153)	-1.026*** (0.179)	0.724*** (0.156)	-0.755*** (0.154)	-0.544*** (0.160)	-0.779*** (0.160)
region4	-2.262*** (0.168)	-2.397*** (0.197)	-1.827*** (0.205)	1.361*** (0.182)	-1.274*** (0.184)	-1.369*** (0.187)	-1.231*** (0.189)
region5	-0.326 (0.185)	-0.524** (0.201)	-0.292 (0.243)	-0.494* (0.214)	-0.356 (0.217)	-0.403 (0.216)	-0.168 (0.218)
region6	-0.901*** (0.120)	-0.978*** (0.136)	-1.065*** (0.170)	1.242*** (0.136)	-1.283*** (0.136)	-1.328*** (0.137)	-1.358*** (0.139)
Constant	-17.54*** (0.526)	-17.43*** (0.591)	-26.94*** (1.325)	12.20*** (0.520)	-12.32*** (0.517)	-14.66*** (0.513)	-15.27*** (0.516)

Observations	3,230	2,833	2,034	2,524	2,523	2,517	2,520
R-squared	0.439	0.453	0.474	0.427	0.446	0.422	0.403
Number of year	29	29	28	20	20	20	20
Adj. R-squared	0.432	0.445	0.464	0.421	0.440	0.416	0.396

Standard errors in parentheses

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05

Note: region1 - East Asia and Pacific, region2 – Europe and Central Asia, region3(omitted) – Latin America and Caribbean, reigon4 – Middle East and North Africa, region5 – South Asia, region6 – Sub-Saharan Africa

**Table 7.** Determinants of PPP project number

	(8)	(9)	(10)	(11)
VARIABLES	pppnumna	pppnumna	pppnumna	pppnumna
Ingdppc	2.425*** (0.400)	2.017*** (0.324)	1.734*** (0.306)	1.263*** (0.305)
Inpop	4.885*** (0.235)	3.112*** (0.114)	3.427*** (0.125)	3.585*** (0.135)
money	0.105*** (0.0106)	0.110*** (0.00896)	0.104*** (0.00882)	0.0967*** (0.00858)
gdpgr	0.129 (0.0685)			
infla	-0.00170 (0.00119)			
exrate				
ex_debt	0.00907 (0.00507)			
fuel_ex	-0.0646*** (0.0114)			
lnoda	-2.047*** (0.359)			
gov_effect		0.0913 (0.528)		
reg_qual			-3.056*** (0.672)	
ruleoflaw			3.978***	

			(0.678)	
cont_cor				1.867*** (0.558)
pol_stab				1.326*** (0.394)
region1	-1.567 (0.966)	-1.326 (0.802)	-2.892*** (0.845)	-1.858* (0.808)
region2	-2.467** (0.906)	-3.685*** (0.767)	-3.738*** (0.763)	-3.601*** (0.767)
region4	-10.81*** (1.150)	-12.05*** (0.949)	-13.16*** (0.977)	-10.99*** (0.948)
region5	-1.339 (1.198)	-0.349 (1.061)	-2.439* (1.104)	-0.686 (1.054)
region6	-1.755* (0.826)	-2.200** (0.712)	-3.469*** (0.736)	-2.893*** (0.710)
Constant	-55.13*** (6.588)	-63.54*** (3.516)	-64.49*** (3.280)	-63.06*** (3.190)
Observations	1,973	2,309	2,308	2,305
R-squared	0.381	0.335	0.345	0.348
Number of year	28	20	20	20
Adj. R-squared	0.368	0.327	0.337	0.339

Standard errors in parentheses

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05

As shown in the previous chapter, formulas can be drawn from each regression which can provide with a tool to examine how much each factor affects PPP and how each continent and country's case can be interpreted according to the regression analysis.

Meanwhile, almost all regional dummies show negative number and are highly significant. The dummies are included to see if there are regional variation when region3 which is Latin America and Caribbean is omitted. It means the regional gap is high and Latin America shows high performance in general in comparison to other regions.

## 2-1. Regional Aspect

A simple summary of the variables by region from the dataset partially explains result in the previous chapter. Latin America has the second highest amount and number of PPP on average and the highest GDP per capita accordingly. It has better money supply level than Europe and Central Asia and Sub-Saharan Africa and more stable price level than ECA and SSA observed from inflation rate index, at the same time which explains its dominance in PPP amount and project numbers over the two regions. However, LAC lags behind in terms of population and money supply. Especially population is much higher in South Asia which partially explains higher PPP performance in SA region despite of worse income condition.

**Table 8.** Summary of Variables by Region (1)

	PPPamt	PPPnum	GDPpc	POP	Money	Infla	exrate
EAP	884	5	1,990	98,230,483	60	9	0
ECA	526	2	3,101	19,635,585	36	138	0
LAC	967	5	4,416	20,701,492	49	46	8
MENA	185	1	2,351	24,686,595	81	13	0
SA	1,330	6	1,372	185,708,598	49	8	0
SSA	73	0	1,492	16,832,472	29	52	567

Source: PPI database, WDI

In case of the governance index, it also shows a general tendency in accordance with the regression result. Latin America has the highest control of corruption index, and the best government index and regulation quality, and is in the second place both in rule of law and political stability. It is somewhat surprising, since the region has a bad reputation

regarding corruption with plenty of corruption scandal and inefficient process of public service. But as the database covers only developing countries, namely low and middle income countries according to World Bank's standard, it seems that Latin America is relatively doing well in comparison to other regions among developing countries and that partially support the idea of why Latin America is relatively popular as a host country in the world of PPP.

**Table 9.** Summary of Variables by Region (2)

	PPPamt	PPPnum	Cont_Cor	Gov_Effect	Reg_Qual	Ruleoflaw	Pol_Stab
EAP	884	5	- 0.50	-0.45	-0.61	-0.39	-0.04
ECA	526	2	- 0.63	-0.42	-0.28	-0.58	-0.42
LAC	967	5	- 0.26	-0.26	-0.17	-0.40	-0.13
MENA	185	1	- 0.61	-0.60	-0.65	-0.62	-1.08
SA	1,330	6	- 0.54	-0.42	-0.60	-0.48	-0.99
SSA	73	0	- 0.60	-0.72	-0.65	-0.67	-0.52

Source: PPI database, WGI

When looking into the EIU<sup>5</sup> (the Economist Intelligence Unit)'s Infrascopes Index, similar result is observed. Although different names, the measures are similar to the governance index from WGI except for financing and investment & business climate, and Latin America and the Caribbean has the highest score among all regions. It means that LAC has the best environment for infrastructure investment among all developing

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<sup>5</sup> EIU has been conducting infrascopes research since 2009 funded by IDB and publishes the index according to their own criteria to measure the enabling environment for PPP.

countries especially it has the highest performance in regulation sector.

**Table 10. Infrascopie index**

Category	Overall	Regulations	Institutions	Maturity	Investment & Bizclimate	Financing
All (67)	57	60	59	60	62	44
Asia (20)	59	61	68	59	64	47
ECA-SEMED (13)	54	54	47	60	61	43
Europe (10)	53	56	42	59	62	43
LAC (21)	60	70	56	63	64	50
MENA (3)	58	52	62	69	55	49
SSA (14)	52	51	57	56	60	34

Source: EIU 2019 Apr database

Note: ECA-SEMED= Eastern Europe, Central Asia and the Southern and Eastern Mediterranean

Since the EIU's infrascopie index has been published since 2009, it is not used as the source of independent variable even though it seems that it reflect better the investment environment of infrastructure, as Latin America has been participating in the PPP projects even before 2009, so it would have failed to include the change in the region before that time.

## 2-2. Regional Aspect – unexplained part

On the other hand, in the table 6 and 7 it says that the regression formula explains about 30% to 35% of the whole dataset which means there is still unexplained part in most of the models. And the coefficients of regional dummies excluding region 3 which is LAC shows that Latin America has higher amount and project number. Throughout the whole observation done in the previous chapter regarding basic numbers and trends of PPP of

each region, it was clear that Latin American region has shown a good performance for almost all period. But as Hammami et al. (2006) also mentioned that Latin America records much higher performance of PPP but the channels used in the analysis such as governments budget constraints, macroeconomic environment, legal system or political environments does not sufficiently support the region's dominance with statistically significant result. It means that there are other factors which are not included in the regression models in this paper and the existing literatures and further research on the difference of region-specific is required.

In this paper, the author would like to suggest the role of regional MDB (Multilateral Development Banks) as one of the possible missing variables which was not included in the regression analysis. In other words, given economic or political environments matter, however MDBs in the region such as Inter-American Development Bank (IDB), Andean Development Corporation (CAF) and Caribbean Development Bank (CDB) would even enhance the efficiency of who are actively participating and support those who lag behind in the region. It is important to point out that in the PPP projects, well-organized and experienced multilateral institutions' supports can play a leading role because: 1) PPP is consist of long-term contract in most of the cases, 2) PPP is accompanied by complicated and long process which requires legal and institutional ability of the related staffs and the institution itself, 3) PPP requires expertise and experience regarding construction and technology to conduct a successful project. All of those capability needed due to characteristics of PPP are what lack in most of developing countries, such as Latin America and the Caribbean, which makes logical that the role of MDBs who

hold those knowledge and experience and are willing to share them to the region's partners.

Indeed, IDB is doing an active job in supporting PPP in the region in various ways. First, it finances 1% of total PPP in the region throughout a fund named Infracund. But the support is not only focused to finance itself, but rather put more importance on making enabling environment for the longer-term development of PPP by holding forum, conference and publishes guide and organize knowledge sharing programs such as Global Infra Forum, PPP knowledge lab, PPP reference guide, etc. The importance that IDB is taking can be observed through its Country Strategy, 72% of CS made by IDB has PPP objectives as priority.

### 2-3. Country Specific Aspects within Latin America and Caribbean

As shown in the previous chapter, Latin America and Caribbean conducts a lot of PPP projects compared to other regions in general. However, this success is derived from a very few countries, such as Brazil, Mexico, Colombia and Peru, excluding Chile and Argentina who were included in the previous list but not anymore, since they are classified as developed countries as for now.

First possible answer is size of the country. Beforementioned countries in Latin America are all big countries, in terms of both economy and land area. That is partially true and so was confirmed through the regression analysis, as those variables had positive coefficient and were statistically significant, as commonly expected.

However, that does not explain the PPP per GDP ratio, which Honduras and Jamaica has the highest number regardless of their low absolute performance and small population and low GDP per capita.

**Table 11. LAC macroeconomic index (2009-2018)**

	PPP(m\$)	GDP(m\$)	PPP/GDP(%)	Population(m)	GDPpc(\$)
Brazil	17,234	1,995,341	0.9%	206.1	9,680
Mexico	5,728	1,188,967	0.5%	123.3	9,643
Colombia	4,602	319,887	1.4%	48.2	6,631
Peru	2,841	203,118	1.4%	31.0	6,556
Argentina	610	567,954	0.1%	43.6	13,031
Honduras	345	21,753	1.6%	9.3	2,346
Ecuador	258	102,730	0.3%	16.5	6,224
Jamaica	223	14,514	1.5%	2.9	4,995
Costa Rica	203	56,162	0.4%	4.9	11,465
Dominican Rep.	155	72,888	0.2%	10.4	7,011
Guatemala	125	69,047	0.2%	16.6	4,163
El Salvador	92	24,234	0.4%	6.4	3,812
Nicaragua	79	12,977	0.6%	6.3	2,059
Haiti	11	8,709	0.1%	10.8	804
St. Lucia	4	1,712	0.2%	0.2	9,506
Total	32507	4,658,281	0.7%	536	8,686

Source: WB WDI

Secondly, governance indexes are another possible answer as suggested and proven in the regression analysis. If the very small size of some countries such as Saint Lucia and Grenada, it is acceptable assumption that governance capacity also matters for determining PPP within the region. Its importance gets bigger considering variety of size of projects in PPP, generally it is true that an investor prefers a big country where it is worth investing, where needed level of return is expected through its demand for public service. However, there can be various size of projects even within

infrastructure projects, and in that case, enabling environment such as trust-based business environment, law-abiding culture and well-organized and strict legal system also may matter as much as macroeconomic situations.

In this sense, we can accept the assumption that governance indexes also determine PPP within Latin America and Caribbean region, looking at the general trend which coincide with the order of PPP amount.

**Table 12. LAC governance index (2009-2018)**

	Cont_Cor	GovEffect	Reg_Qual	Ruleoflaw	Pol_Stab	Average	PPP(m\$)
St. Lucia	0.85	0.43	0.37	0.68	0.88	0.64	31
Costa Rica	0.66	0.37	0.49	0.51	0.61	0.53	1,850
Grenada	0.43	0.02	0.15	0.19	0.68	0.29	14
Jamaica	- 0.22	0.25	0.21	- 0.31	0.07	-0.00	2,185
Brazil	- 0.20	- 0.17	- 0.03	- 0.11	- 0.17	-0.14	248,745
El Salvador	- 0.40	- 0.17	0.22	- 0.71	- 0.04	-0.22	476
Peru	- 0.40	- 0.21	0.47	- 0.54	- 0.63	-0.26	26,440
Mexico	- 0.60	0.17	0.31	- 0.54	- 0.70	-0.27	47,328
Colombia	- 0.34	- 0.05	0.36	- 0.33	- 1.20	-0.31	29,850
Argentina	- 0.38	- 0.10	- 0.72	- 0.58	0.04	-0.35	6,168
Belize	- 0.18	- 0.52	- 0.50	- 0.62	0.08	-0.35	44
Dominican Republic	- 0.80	- 0.47	- 0.10	- 0.57	0.12	-0.36	2,131
Nicaragua	- 0.83	- 0.83	- 0.43	- 0.75	- 0.27	-0.62	1,094
Honduras	- 0.79	- 0.68	- 0.32	- 1.00	- 0.45	-0.65	3,587
Guatemala	- 0.66	- 0.69	- 0.19	- 1.02	- 0.69	-0.65	2,379
Ecuador	- 0.67	- 0.50	- 1.05	- 0.99	- 0.31	-0.71	1,477
Haiti	- 1.22	- 1.81	- 1.09	- 1.22	- 0.77	-1.22	115

Source: WB WGI

However, it still does not explain enough some cases such as Costa Rica, whose governance level and income is high but holds a very small portion of PPP within LAC region, and Brazil, even considering its absolutely big size and high income, relatively good investment environment, who still conducts exceptionally big amount of PPP projects.

Within Latin America, it is hard to find determinants that covers the whole region in a balanced way, since the dependent variable itself is highly concentrated in a very limited number of countries, starting with Brazil who occupies 60% of PPP investment amount in the region all time long and the other big countries like Mexico and Colombia. In the first glance, it seems that relatively well-off countries with higher income level, huge land area, large population and GDP vacuum all of the money invested in the region. But even controlling the country size and income level there still are some unexplained question, why Brazil gets much more PPP than Ecuador?

It seems that it is necessary at this point to divide the determinants in two ways: demand side and supply side. In the quantitative analysis conducted in this paper and in the existing literatures, the basic assumption has been that the host countries want to attract PPP and hold the same desire and activeness, which easily will not be true. Some countries may not prefer PPP type projects because of ownership issue or lack of entire control on the country's security related provision, or complicated process required in

PPP will not be considered as suitable for some countries, causing higher administrative cost. On the other hand, some countries would specially be eager to attract PPP projects since that way may allow them to get technical assistance from multilateral banks easier than any other methodology.

From this new assumption of flexibility in host country's choice, a tentative result can be drawn that the country's goodness as an investment's destination matters but in case of PPP which is relatively new in developing countries and could probably be treated with different interest and preference, it also matters the capacity is specifically related to conducting PPP's complicated contract process and long-term business and the initiative that the country holds.

One of the most important success factors for the efficient infrastructure project implementation that reflects the host country's initiative will be the existence of a department or manpower dedicated to the sector considering its characteristics as a long term, complicated and multi-layer bearing project. Even though budget is enough, if there is no staff with related expertise or even no staff dedicated to the job at all, it will be very difficult for the project to go well. It is especially true in case of PPP since in most cases there are foreign actors involved those who have different language and experience of different legal systems and culture. Thus, not only the success of the project but even from the first stage of design to contract, it will be extremely hard or take long time if there is no adequate organization, in other words, a dedicated agency.

Within LAC region, there are in total 12 countries who have a PPP dedicated agency

among 21 countries who are in the PPI database. As easily expected, from Brazil to Peru, including Mexico, Argentina and Colombia who are the 'big 5' of Latin America in PPP, has a dedicated agency. It means in those countries, there is workforce who are dedicated to the whole process of PPP and responsible for the efficient and effective execution of projects, while others who do not have, where the responsibility lies by each step of procedure is not clarified. Having the importance of existence of dedicated agency in mind, Brazil is an exceptional case in this sense by having 7 PPP unit in each main states of the country, not only federal level department, including Minas Gerais' department which was made with the support of IDB in 2012. Not only just the existence but also the quality and availability of practically dedicated work force matters. Actually Mexico, Argentina and Colombia are reported as having a dedicated agency, but they are a part of Ministry of Planning or Finance, or Transport, controlled by different leaders in each step of project which can be considered as a sign of inefficiency. Although there are reasons why those countries chose to have a PPP unit not so much concentrated organization, for example, to guarantee transparency and independence from all other departments, it seems that Brazil's centralized system works better, when looking its absolutely high performance.

On the other hand, enough number of manpower with experience in the field does not guarantee active PPP attraction. More importantly, a workable legal and regulatory framework should be established to enable the formulation of effective contractual vehicles for PPPs that are compatible with a country's legal system. (Zhang, 2005)

Latin American countries have acknowledged the importance of PPP in providing infrastructure as a developing country, they have been prepared for the law and institution from the earliest stage. Especially Chile, a country already is considered as high-income country since 2012 thus not included in the sample for analysis of this paper, enacted regulation on concession regarding PPP for the first time in the region. After it has prepared more detailed and enforceable law and regulation on compensation and proposal procedure during coming years.

Peru and Colombia also set principals regarding public sector's concession in the early 1990s, starting to prepare a step stone for legal base for PPP. Meanwhile, Mexico has been lagged in this sense, enacting PPP related law only in 2012.

Brazil, who is without argument the biggest player of PPP in the region, started to make a law since 2003 from the state of Minas Gerais in 2003, and the next year in São Paulo, and the same year through the federal level law for PPP has been enacted to pursue more vigorous PPP projects implementation. Even though law regarding exactly PPP has been enacted only in 2003, there has been article regarding private participation in public procurement in the procurement law from 1993 and concession law on public service has been enacted in 1995, in the earliest days of PPP implementation in the region. In the PPP law enacted in 2004, essential infrastructure investment promotion is included as a purpose of the law. Recently in 2016, IPP (Investment Partnerships Program) law has been enacted where it draws a clear line on clear and thorough regulation and special task force from federal government level organization to promote especially energy

sector infrastructure through PPP.

## **v. Conclusion**

### **1. Findings from the Research**

In this paper the determinants of Public-Private Partnership has been studied which is getting more and more popular these days among developing countries to provide infrastructure, one of the most important factors for economic and social development. Empirical analysis was conducted using regression including whole developing countries and also a study was conducted on specific factors related to the target region, Latin America. From the research, it is found that large market size, stable macroeconomic and easiness of financing are important factors regarding economy side, and governance capacity is another factor that could attract more PPP. Aside from that, it is probable that legal frame and dedicated agency with sufficient workforce supported by expertise of regional development banks also matters. It implies that infrastructure PPPs are more demand-driven than supply-driven which is a hopeful signal since market size, macroeconomic environment or governance goodness are more given factors or at least take a long time to improve the whole level, but PPP specific factors are more feasible to achieve improvement within relatively short term. It is notable that PPP's determinants studies have been conducted mostly in a uniform way, but it may be worth dividing the determinants into two groups, demand side of host country to see why the public sector desire to attract private investment and by how much, and supply side, the private investors, why they want to make investment in the PPP projects. It also supports the reason why government budget constraint was not proved to be a determinant as

strong as expected, since it only explains the motive of the public sector of host country, while budget constraint could hardly be an attractive aspect for the investors those who want to invest in the project where the public sector is the main actor.

In this sense, Latin American region's active PPP participation does not only mean that this region meets the requirements that private corporation would consider as a secure investment destination but rather the region started early to focus on preparation of institution and legal frame, especially the major countries in the region such as Brazil, Colombia, Mexico, Peru and Chile who is not in the database anymore after graduating the middle income country group since 2012, thanks to the active infrastructure development.

Lastly, as in many development studies related to its determinants, sometimes the border line between the cause and the effect is not that clear. In some cases, a country has developed very quickly because it has received a big push from a generous donor, but in other cases it seems that only the potential countries get investment or aid those who already held high probability of rapid economic growth in any near future. In the academic structure of PPP also lies the same argument of chicken and egg. But for the development of a country or region, it will be more valuable to find out how to obtain the needed resource within the given conditions that are less manageable for a short term. For low and middle income countries in Latin America, quantitative and qualitative efforts to build attractive and competitive investment environment by making effective government budget management, building a transparent institution and set the priority

in accordance with the national plan while setting up a task force dedicated to the PPP function equipped with well-trained experts alongside with the support of multilateral banks' expertise and financial knowledge will have to be implemented to achieve the goal as infrastructure provision for the country's long term economic and social development. It especially shed a light to the smaller countries in the region, since the big five are already doing fine job and the gap of PPP and infrastructure coverage is still huge, meaning the late developers should start to run together with the cooperation partners in the region by enlarging market size through diverse layers of regional integration and through cooperation with the regional actors such as Inter-American Development Bank.

## 2. Limitation and Further Research

The main limitation of this paper is not being able to set a uniformed model including all factors qualitatively analyzed in the precious chapter, such as existence and quality of PPP agencies, level of goodness of legal frame specifically armed for PPP. In the further research, it is expected to combine all determinants of demand side and supply side and structure a versatile model with more deepened study on each country's institution and law which will be a huge contribution for Latin America's vigorous and balanced development.

Secondly, a deep qualitative study on Brazil's PPP history would be needed considering its unique characteristics of carrying absolute portion of projects not only in the regional level but also as t top country in the worldwide among all developing countries. By

tracking its strategy in the initial steps, it also will be possible to give lessons to other developing countries in the region by providing an example to follow and thus enable to promote the region's economic growth which can benefit not only the follower but also the leading economies in the region together.

## Bibliography

- 권기수, 김진오, 박미숙, 이시은 (2016), 「민관협력사업(PPP)을 활용한 중남미 인프라·플랜트 시장 진출 확대방안」, 연구보고서 16-20. 대외경제 정책연구원
- 이준희, 김종섭(2014), 「중남미 인프라 민관협력의 특징 및 주요요인 분석」, 라틴아메리카연구, Vol. 27, No. 2: 187-208.
- Allen and Overy. (2009). Global infrastructure development and delivery—The stimulus for debate, Allen & overy global survey. London: Allen and Overy LLP.
- Arezki, R. & Ferid, B. (2019). Developing public-private partnership initiatives in the middle east and North Africa: From public debt to maximizing finance for development, Policy Research Working Paper Series 8863. Washington, D.C.: World Bank Group.
- Benergee, S., Oetzel, K., & Ranganathan, R. (2006). “Private Provision of Infrastructure in Emerging Markets: Do Institutions Matter?” Development policy review, 24(2), 175-202.
- Calderón, C. & Servén, L. (2010b). Infrastructure in Latin America. Policy Research Working Paper 5317. Washington, D.C.: World Bank Group.
- Di Liddo. G., Rubino. A., Somma. E. (2019). Determinants of PPP in infrastructure investments in MENA countries: a focus on energy. Journal of Industrial

and Business Economics. Vol. 46, Issue 4, pp. 523-580.

Égert Balázs, Koźluk Tomasz, & Sutherland, D. (2009). Infrastructure and growth: empirical evidence. Organisation for Economic Co-operation and Development. Economics Dep. Paris: OECD.

Estache, Antonio, Biagio Speciale, and David Veredas. (2005). How Much Does Infrastructure Matter to Growth in Sub-Saharan Africa?. Washington, D.C.: World Bank Group.

Estache, A. (2006). Infrastructure: A survey of recent and upcoming issues, Washington, DC: World Bank.

Hammami, M., Ruhashyankiko Jean-François, & Yehoue, E. B. (2006). Determinants of public-private partnership in infrastructure. Washington, D.C.: International Monetary Fund, IMF Institute.

Harris, C., Hodges, J., Schur, M. and Shukla, P. (2003), "A review of cancelled private projects, public policy for the private sector", Note No. 252. Washington, D.C.: World Bank Group.

Karsi, A.R. and Wibowo, F.A. (2015). "Determinants of Public-Private Partnerships in Infrastructure Provision: Evidence from Muslim Developing Countries", Journal of Economic Cooperation and Development, 36, 2 (2015), 1-34

Kenny, C. (2007), "Infrastructure Governance and Corruption: Where Next?", Note No. 4331. Washington, D.C.: World Bank Group.

- Leibenstein, Harlay. (1966), “Allocative Efficiency vs. ‘X-Efficiency’”, *American Economic Review*, Vol. 56, No. 3 (June), pp. 392–415.
- OECD. (2014). *Private financing and government support to promote long-term investments in infrastructure*. Paris: OECD.
- Pongsiri, N. (2002). Regulation and public-private partnerships, *The International Journal of Public Sector Management*, 15(6), 487–495
- Ruiz-Nuñez and Wei (2015). *Infrastructure investment demands in emerging markets and developing economies*. Washington, D.C.: World Bank Group
- The Economist Intelligence Unit. (2019), *Evaluating the environment for public-private partnerships in Latin America and the Caribbean, The 2019 Infrascope*. New York: EIU.
- Yescombe, E. (2007). *Public-Private Partnerships: Principles of Policy and Finance*, Oxford: Butterworth-Heinemann.
- World Bank Group (2017). *Contribution of Institutional Investors: Private Investment in Infrastructure*. Washington, D.C.: World Bank Group
- X.Q. Zhang (2005). Critical Success Factors for Public-Private Partnerships in Infrastructure Development, *Journal of Construction Engineering and Management*, 131/1 (January 2005): 3-14.

## Appendix

**Table 13 . Correlation table**

	lnppp	ppnum	ngdppc	lnpop	gdpgr	money	infla	exrate	ex_debt	fuel_ex	lnoda	cont_cor	gov_ef~t	reg_qual	ruleof~w	pol_stab
lnppp	1.00															
pppnumna	0.54	1.00														
lngdppc	0.27	0.20	1.00													
lnpop	0.56	0.49	-0.07	1.00												
gdpgr	0.08	0.07	-0.09	0.14	1.00											
money	0.32	0.41	0.36	0.24	-0.00	1.00										
infla	0.02	-0.03	-0.04	0.09	-0.02	-0.17	1.00									
exrate	-0.02	-0.01	-0.02	0.03	0.00	-0.02	0.02	1.00								
ex_debt	-0.19	-0.17	-0.21	-0.29	-0.14	-0.14	0.10	-0.01	1.00							
fuel_ex	-0.04	-0.08	0.19	0.16	0.02	-0.15	0.11	0.01	-0.08	1.00						
lnoda	0.37	0.24	-0.26	0.70	0.20	0.17	-0.04	0.01	-0.19	-0.07	1.00					
cont_cor	0.10	0.11	0.34	-0.23	0.00	0.27	-0.09	-0.04	-0.09	-0.34	-0.17	1.00				
gov_effect	0.30	0.23	0.47	0.01	0.03	0.44	-0.07	-0.06	-0.05	-0.26	-0.03	0.75	1.00			
reg_qual	0.29	0.14	0.39	-0.05	-0.02	0.23	-0.11	-0.09	0.02	-0.33	-0.01	0.60	0.77	1.00		
ruleoflaw	0.13	0.11	0.30	-0.19	0.02	0.34	-0.10	-0.05	-0.06	-0.37	-0.08	0.81	0.80	0.69	1.00	
pol_stab	-0.17	-0.05	0.21	-0.52	0.02	0.08	-0.10	-0.02	0.09	-0.28	-0.42	0.52	0.40	0.34	0.58	1.00