CHAPTER 1. INTRODUCTION

1.1. Introduction

McKinsey Global Institute (2016) predicts that the world requires an average of $ 3.3 trillion annually in infrastructure investment in order to attain an economic growth target for the period of 2016-2030. While according to the Thompson Reuters, the global syndicated lending reached US$ 4.6 trillion in 2017. In the first half of 2018, in the Asia Pacific excluding Japan's capital market alone, the syndicated lending achieved a level of US$ 212 billion. Project finance is "the most common techniques for the financing for infrastructure" Thierie and Moor (2018). The future infrastructure investment requirements are primarily in the electricity, transport, telecommunication, water supply and sanitation sectors. The "population growth, urbanization and industrialization are spurring demand in the infrastructure investments in developing countries" (Thierie and Moor, 2019). The requirement of infrastructure in Asia is vast, $ 26 trillion is requisite from 2016 to 2030 according to the ADB infrastructure report (2017), while the Southeast Asian countries require an investment of US$ 145 billion annually to attain its growth momentum, poverty eradication and climate change mitigation challenges. Provided that project finance is the typical finance technique for infrastructure investment, Given the vast investment requirement with a constrained public sector fiscal space, private sector participation in the infrastructure investment is vital.

This paper's research areas fall within the project finance topic of: (i) the risk measurement; (ii) international project finance debt syndication as well as international project development prospect (Kayser, 2013). The research objective

of this paper is to assess the determinants of the loan spread and project interest rate wedge between project finance transactions among ASEAN countries in which it will highlight the significant aspects of the area of project finance theme in term of the prospective return of the infrastructure project, the risk mitigation feature of project finance in addressing a various risks and future stability requirement in achieving the future country growth target through infrastructure investment. Firstly, the deregulation of the infrastructure sector: electricity, water, telecommunication, and others in the ASEAN four countries of Indonesia, Malaysia, Philippines and Thailand, prompts many international investors simultaneously with expansion of the global banks to the developing countries; searching for the new market prospect and a higher yield on their infrastructure project loan. Global banking's pursuit in the developing countries for the return represented by the loan spread over the risk-free yield represented by the London Interbank Offered Rate (LIBOR). LIBOR is defined by Hou and Skeie (2014) as the benchmark rate in which major banks reveal their ability to borrow at short term wholesale funds from one another on an unsecured basis within the inter-banking. The return maximizing behaviour in line with Carlos and Magni (2008)'s suggestion that a company would utilize a Capital Asset Pricing Model (CAPM) in capital budgeting to assess the target return hurdle rate in excess of the enterprise cost of capital, the loan premium on the infrastructure project loan over the LIBOR as the risk-free yield. Moreover, as it argued by Rubinstein (1973) and others in the 60's and 70's, cost of capital is a function of systematic risks represented by Beta factor in which could be interpreted as the specific country

risks; that is reiterated by Harvey (1990) and Verma and Soydemir (2006), encompass political, macroeconomic and others. Secondly, the expected return and country risks derive from the Beta coefficient of the CAPM such as political risk importantly has to be well-mitigated.

As certain factors of political risk faced by the international investor are not plausible to be addressed by the investors themselves, political risk insurance in the form of third-party guarantee from the host government and multilateral agency. The host country government has the best interest to promote the investment in their country's infrastructure program given the role being the public good. Thierie and Moor (2019) insinuate the prominence of the project financing as its financing affiliation of infrastructure as the public good such as electricity, water, toll road and others which are ultimately forfeited by the taxpayers. Further, infrastructure through private sector participation (PSP) takes a part in easing the public sector fiscal space thus assisting the government pressure to deliver the infrastructure service. Hence, in order to attract private sector participation in infrastructure, the host country government typically provides a guarantee in the form of the explicit or implicit government guarantee for the private sector to mitigate a number of risks that is difficult to address by the private sector. Hence, thirdly, the attainment of the growth trajectory target of the many developing countries hinges on the successful delivery in infrastructure investment specifically on the PSP, due to the limited government budget. Syndicated project finance loan plays a vital role to the infrastructure services delivery in the developing countries in achieving the economic growth, through

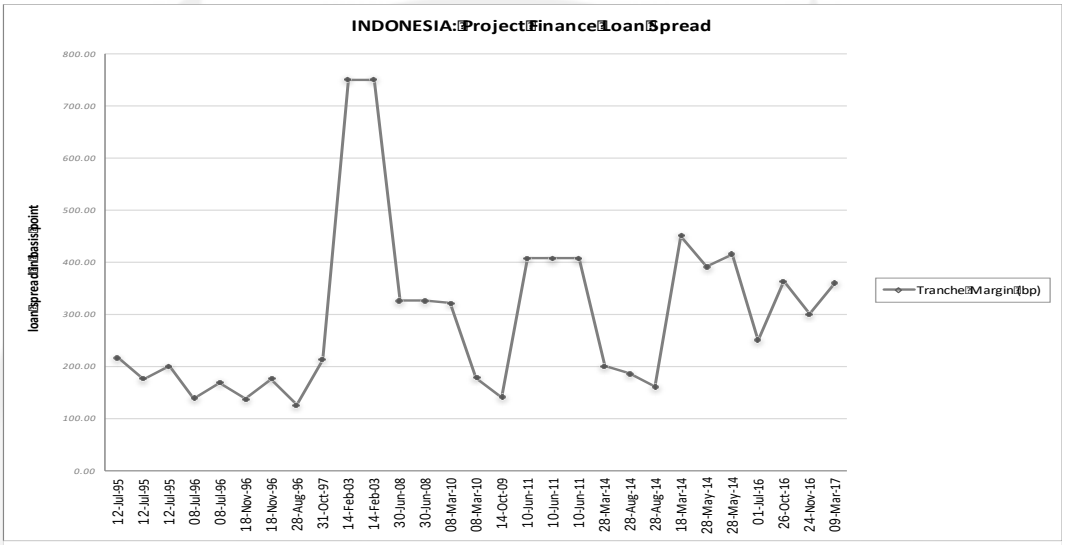
the vast investment requirement attainment (Sorge, 2004). Investigating the linkage between the economic growth and project finance, Kleimeier and Versteeg (2010) analyse the role of project finance to the development in the least developed countries and the typical financing technique within the infrastructure space, whereas Fedderke and Bogetic (2009) assert of the prominent role of infrastructure in delivering economic growth through capital accumulation and indirectly via total factor productivity gains. Furthermore, an analogy made by Yescombe (2002) that the growth of project finance in the developing country since 1990s is seen as a way to allocate the financing burden of the public sector infrastructure development to the private sector, in which a transfer of the financial technique commonly utilized by the international developers' infrastructure financing in the developing world. In short, a private sector participation is a vital aspect of economic growth. since 1990s is seen as a way to allocate the financing burden of the public sector infrastructure development to the private sector, in which a transfer of the financial technique commonly utilized by the international developers' infrastructure financing in the developing world. In short, private sector participation in the infrastructure investment is the critical success factor in achieving the country's economic growth target.

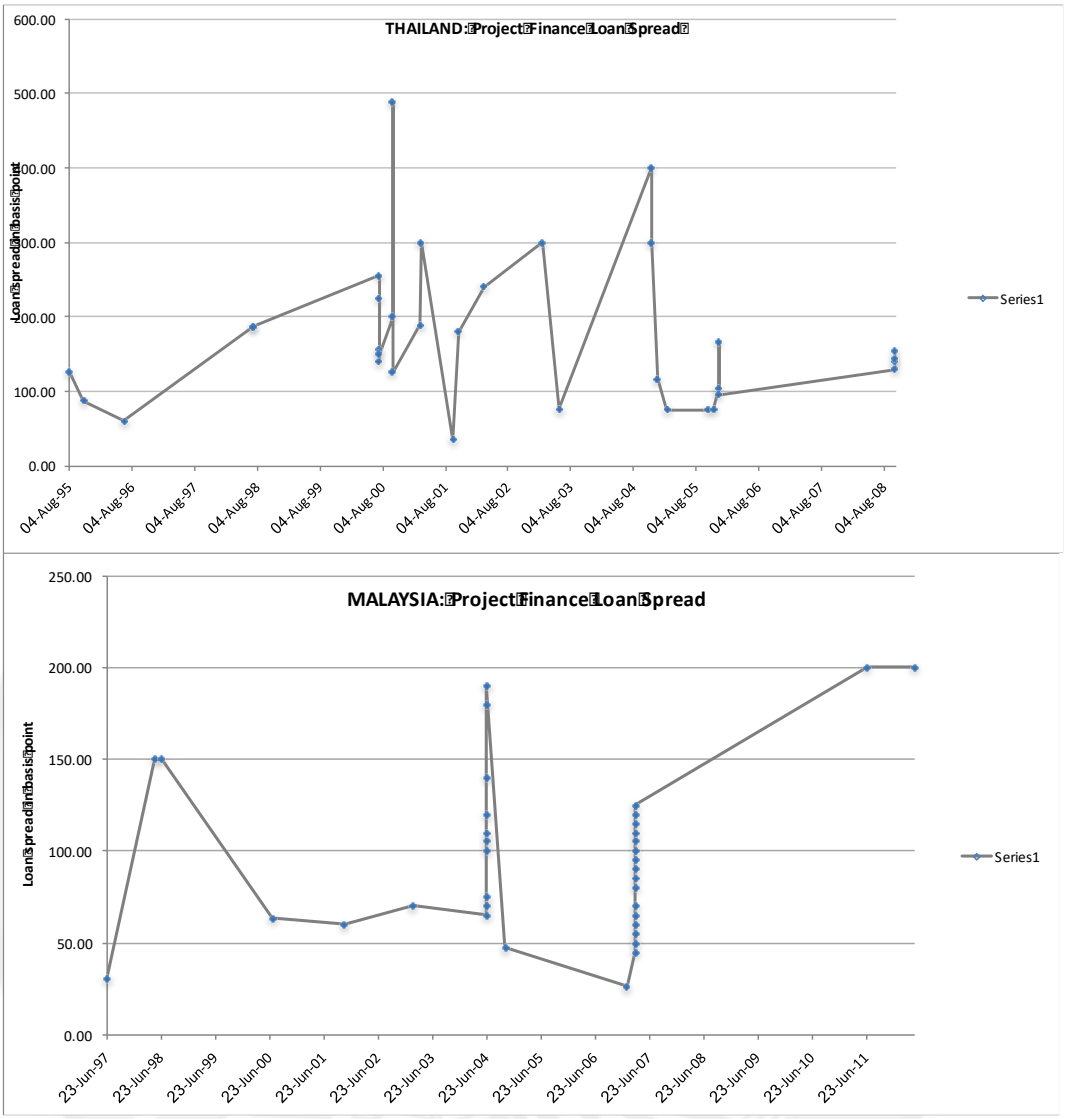
project finance can also be seen as is a financial scheme by-product of the public private partnership (PPP), Delmon (2009) defines it as

"The arrangements between public and private entities for the delivery of the infrastructure services and are seen as a way of additional funds for infrastructure

investments but more importantly as a means to extend or leverage better budget funding through efficiency gains".

Chart 1: Project finance loan spread over LIBOR in the ASEAN four countries for selected project financings.





Source: Dealogic projectware database

A commonly called group of five ASEAN (Association of South-East Asian Nations) countries which make up the major economies within ASEAN economic community, which are composed of Indonesia, Malaysia, Philippines, Singapore, and Thailand. However, this paper will focus solely on the ASEAN-4 excluding Singapore, amid its economic structure and high level of GDP per capita today. In the aftermath of the Asian crisis in 1997, Singapore has managed to strengthen

and liberalize its economy through “liberal market opening with active preparation of domestic financial sector and reformed regulatory framework” (ASEAN Integration report, 2015). Furthermore, level of infrastructure service delivery and the infrastructure industry structure; the utility sector, power sector, as the prominent project finance loan recipients in Singapore is distinct which adopts the limited retail competition market model relative to the other ASEAN-5 countries which still embrace the single buyer model (Yokota and Kutani, 2017). Hence, it would be discordant to include Singapore in the study of comparison. Furthermore, the ASEAN countries have economic commitment to implement Free Trade Area (FTA), reducing tariffs on more than 7,000 product categories - or 90 percent of imports - to zero in 2010, although initially they only applied to Indonesia, Malaysia, Singapore, Brunei, the Philippines, Singapore, and Thailand.

The presence of the loan spread differential within the similar infrastructure projects within the ASEAN four countries is critical to investigate. Although the previous literatures have investigated the loan macro and micro variable factors that determine the loan spread, mainly discussing the empirical investigation from the aggregated global data set of loan syndications and the comparison between the developing versus developed countries’ results. The loan spread differential among the developed and developing countries lies mainly in the aspects of the political risk and third- party guarantee presence (Kleimeier and Megginson, 2000). Whilst the average project finance cost is higher and the gearing ratio is lower within the developing countries (Annamalai and Jain, 2013).

Minimal studies have been done on the cross-country loan spread variant; while it is important to comprehend the loan spread divergence for the infrastructure project across countries within region. Hence, valuable lesson can be drawn in undertaking the cross-countries comparison within Asia-Pacific region, being the important recipient of project financing globally. Kleimeier and Megginson (2000) allege that Southeast Asia was the largest recipient of project finance loan and Indonesia and China. Moreover, this paper attempts to examine the project finance loan spread determinants over the London interbank offered rate (LIBOR), while contemporaneously trying to understand how the micro and macro loan characteristics of the project finance impact the spread and project interest rate charged in the ASEAN four countries of Indonesia, Malaysia, Philippines, and Thailand. Hence, it is imperative to learn the determinant of the loan spread and cross-countries differential.

1.2. Background

Ballestero (2000) defines "project finance as a sound technique which involves performing a set of security arrangements to reduce risk in large infrastructure investments" which comprised of the sectors such as roads, highway, railway, electric power, telecommunications, pipeline, and many others. In comparison to the corporate finance, among others the distinctive characteristics of the project finance are: (i) the existence of the special purpose vehicle (SPV) created by the equity holders; (ii) the well-balanced risk allocation

to the parties who are best in taking the risk through the legal contracts; (iii) primarily utilized financing technique in the developing countries (Esty, 2011).

Given its unique features, the vast investment requirement in the infrastructure sector as the capital-intensive sector, places the dominating debt market on the pedestal, specifically on the project finance loan (PF) to fill the investment gap requirement from the fiscal space sourced from the government budget. It is hypothesized by Kleimeier and Versteeg (2010) that a project finance plays a developmental impact role through its financing availability to the least developed economies in which it substitutes the deficiency in the domestic financial development.

On the international investment financing requirement, how much is the country risk and other associated factors affecting the loan spread premium is to be commanded on the cost of financing for the international investment. The classical loan pricing model is firstly based on the Merton/Black-Scholes (MBS) option pricing framework for the pricing of default risk on corporate debt (Merton, 1974). Blanc-Brude and Strange (2007) recapitulate that the MBS pricing model anticipates the credit spread correlates to the risk-free rate on the loan, which is typically LIBOR, as well as the debt maturity. As asserted by Kleimeier and Megginson (2010) project finance attends to have a peculiarity relative to the corporate finance, with among others, a longer term of maturity, frequent presence of the third-party guarantee, non-US and riskier borrowers and macroeconomic risks.

The distinctive features of the project finance relative to corporate finance, have been discussed by a number of literatures. As mentioned above, a number of empirical studies have been performed on the topic of the project finance loan comparative study. Kleimeier and Megginson (2000) undertake an empirical analysis of project finance in comparison with corporate finance, in which the results seem to infer that the project finance loan spread determinants: the country risk, loan contract covenant, tangible asset rich sector and project leverage are positively related while the third guarantee presence inversely affecting the loan spread over LIBOR. Conversely, to Kleimeier and Megginson (2000)'s findings, who suggest that the loan maturity is not a determining factor, Sorge and Gadanecz (2004) find that the non-linear relationship explicates the relationship between the loan spread over LIBOR and loan maturity, while they also observe that the political risk and political risk guarantee impact the loan spread. Esty and Megginson (2000) demonstrate that loan syndicate and size impact the project finance loan spread pricing.

The finding of Kleimeier and Megginson (2000) of an insignificant linear relationship between the maturity factor on the loan spread factor, emerges as a follow-on research theme that peculiarity of the maturity on the project finance relative to other type of finances, is explained by Sorge and Gadanecz (2008) of the hump shaped of the spread and maturity relationship. Simultaneously, this hump shaped outcome can be explained by the political risk mitigating factors of the explicit or implicit guarantees from multilateral development banks and export credit agencies (Sorge and Gadanez, 2008; Girrardone and Snaith, 2011).

Additionally, Kleimeier and Esty (2000) explore the syndicate structure's response to the loan pricing and its linkage with the political risk.

Sorge and Gadanecz (2008) reiterate their empirical analysis and results on the relationship between the ex-ante loan spread and maturity, by using the controlled microeconomic: syndication size and loan type and macroeconomic variables: real GDP, inflation, investment ratio, credit and current account balance to GDP, debt service to exports, corruption index and slope of US treasury yield. Thierie and Moor (2018) explore the loan pricing decisions on the project finance loan influenced by the market and business cycle.

Girrardone and Snaith (2011) extend the analysis by utilizing the disaggregated political risk determinants in which their empirical results imply that the spread is negatively correlated with the effectiveness, quality, and strength of a country's legal and institutional system, whereas the weak government is associated with the lower loan spread.

Moreover, as asserted by Sorge (2004) and Sorge and Gadanecz (2008), the empirical finding that a project finance technique differs from a corporate finance given its non-linear relationship between the loan maturity and spread which indicates that a longer loan tenor may not perceived riskier than a shorter-term loan tenor. However, the above authors asserted further that the lenders' commitment for a long-term international investment makes them susceptible to the political intrusion by the host government. Hence, the topic of political risk is a critical and vexing matter for the lenders and multinational companies, a number of authors undertake the empirical investigations to assess the relationship

between the existence of country's political risk and project finance (Kleimeier and Versteg, 2011; Annamalai and Jain, 2012; Hainz and Kleimeier, 2012; Girrardone and Snaith, 2011; Sawant, 2011) observe the participation of more foreign banks for the project finance transaction in the developing countries.

Regarding the data source, various literatures use different financial data providers on the syndicated loan such as: Annamalai and Jain (2012) apply the Project Finance International (PFI) database; Esty and Megginson (2000) apply the Loanware database; Kleimeier and Megginson (2000) apply the Loanware database; Sorge and Gadanecz (2008) as well as Girrardone and Snaith (2011) with the Dealogic projectware. Moreover, on the country risks, typically the data is obtained from the International Country Risk Guide (ICRG), Euromoney country risk survey and World Bank Governance Indicators (WBGI). While the macroeconomics and microeconomics data are obtained from the IMF world economic outlook and Institute of International Finance developing country database.

Despite the dramatic improvement in the Asian countries' development, developing Asia still require vast infrastructure investment as over 400 million Asians still lack electricity; roughly 300 million have no access to clean water and 1.5 billion with inadequate basic sanitation (ADB, 2017).

Given the dominance of utility sector as the project finance loan's recipient, this paper will discuss the evolution of the electricity in the ASEAN-4 countries. Analogous to other infrastructure sector, the surging electricity demand in order to meet its GDP growth target, the electricity industry embarked on a

liberalization transformation, started in Chile then extended to many developing countries in the 1990's (Nagayama, 2008), as these countries are grappled with their public service obligation to meet the electricity supply requirement amid the surging electricity demand, the limited fiscal space and the subsidy rationalization (Victor and Heller, 2006). As one of the private sector participation schemes, a public private partnership (PPP) has been adopted in many developing countries including Asia, particularly within the energy, telecommunication, transportation, and water facilities. According the ADB infrastructure report (2017), private sector investment has been pronounced in the telecom and power sector within the infrastructure space. The PPP scheme is seen as an effective mean to reduce the government financial burden, while generating an improvement in the service quality, efficiency and well-balanced risk sharing allocation (World Bank, 2011; Yuan, 2010). The ASEAN 4 countries of Indonesia, Malaysia, Philippines, and Thailand's electricity sector model has transformed from the pure monopoly to the single buyer model with some private sector participation allowing the IPPs (independent power producers) to produce electricity and to be off take by the state-owned utility company; as part of the deregulation effort in the generation sector. The electricity industry has evolved from the government monopolies originally planned, owned, and controlled institution, to the deregulated industry that is postulated to reach electricity price efficiency (Nagayama, 2008); as well as profitability, efficiency, and resource allocation (Megginson and Netter, 2000). The government controlled of political institution impacts the risk premium of the sector, particularly in the eve of expropriation and contract disputes (Jensen,

2005). In contrast the deregulation and privatization with the private sector participation in the power sector tend to have a positive prominent effect on the developing countries' economic development, as it typically correlates with the improvement of the political risk perception. Countries with the deregulated utility industries have experienced a rise of private sector participation (Manu et al., 2017). A study on the how political risk affects foreign direct investment undertake by Araya, Schwartz, and Andres (2013); in which an analysis of a country risk rating including political, economic, credit and financial conditions, explicates a part of the differences among countries to attract investments. Borisova and Megginson (2011), attempt to seek an understanding of the state-owned divestiture effort's consequences on their credit profile. The investigation of the impact of the government ownership on the cost of debt in in which the result seems to suggest that the improvement of political risk hinges on the level of government ownership.

While the R-squared of the various literatures range between 15-27 % value. Looking at the previous literatures, the relevant independent variables which will be utilized by this paper's econometrics modelling, provide significant results yet do not yield a high R-squared outcome. This potentially means that the explanatory or independent variables correlate with the dependent variable however it does not explain much of the variability of the dependent variable. Having said this, low R-squared does not negate the significance of the independent variables in explaining the relationship with the dependent variable. However, the relatively low R-squared outcome partially motivates this paper of

to incorporate other novel explanatory variables, with the objective to improve the model, thus the relationship between the dependent and explanatory variables. Aside from the previous literatures' regression outcome motive, a comprehensive model beyond the previous studies will be attempted to yield from this paper from the novel research model specification on the loan spread determinants.

1.3. Problem Statement

Given the importance of project financing to meet countries' infrastructure requirement, given the fiscal constraints, limited stock of research on project finance, hence it is urged for further study and investigation amid the growth of project finance (PF) worldwide and wide usage in the infrastructure sector with its high development impact (Esty, 2004; Kleimeier and Megginson, 2010; Sorge and Gadanecz, 2008), while limited study on the Asia-Pacific countries specifically given the significant size of project finance in this region (Kleimeier and Versteeg, 2010). Byoun and Xu (2014) urge further research to understand the effect of political risk on project cash flows given the importance of viability of PF as the non-recourse financing, in contrast to the subject of the ability of PF structure to address project specific risk. Particularly in the developing countries like the ASEAN-4, to structure the various risks for the international lenders to lend in these countries; makes PF everly critical to gain more comprehension.

Limited previous empirical research on the project finance's features which mitigate the risks that the multinational company faces in the eve that host country possess a considerable level of political risk and weak investor protection

(Hainz and Kleimeier, 2012, Sawant, 2010, Annalai and Jain, 2012). Moreover, despite the lack of available data, an understanding on the study of credit risk of the project finance shall be undertaken further, while taking in to account the development aspect of the project finance availability; the developing country's access to the affordable long-term fund is vital (Sorge and Gadanecz, 2008), as well as the developed countries low interest rate factor environment as the capital flow incentive to the developing countries.

1.4. Research Questions and Research Objective

The research questions of this paper:

(i) What is the cross-countries determinants of the project finance loan spread over the London Interbank Offered Rate (LIBOR)?

(ii) What is the cross-countries determinants of the project finance loan interest rate charged on the project?

Previous literatures have explored the determinants of the project finance loan spread; however, it fails to attend the analysis at the country specific level and the project interest rate charged, hence the insightful understand at the country level is difficult to be obtained.

The objective of the study is to investigate the extent of relationship of the project finance loan spread over the London Interbank Offered Rate (LIBOR) and project interest rate charged arisen from : (i) the country's political and sovereign risks, and guarantee to be grouped as the critical risk factors; (ii) micro loan

characteristics to be grouped as the return attributed factors; (iii) macroeconomics characteristics to be treated as control variables, as well as the deregulation effect in the infrastructure sector in the ASEAN four countries. However, this paper will focus only on the critical risk and on return attribution factors as well as the deregulation effect. The investigation will be undertaken and elaborated by drawing on the existing literatures of the determinants of the project finance loan pricing spread (Kleimeier and Megginson, 2001; Sorge and Gadanecz, 2008; Thierry and Moor, 2019) and its relationship with the sets of micro characteristics of loan and macroeconomics variables, political risks at the disaggregated level (Girardone and Snaith, 2011) and the deregulation (Megginson and Netter, 2011) utilizing the Ordinary Least Squared (OLS) research model. The existing literatures also attempt to explicate the determinants of the project finance loan spread as well as how the project finance loan is distinct from other type of loans (Kleimeier and Megginson, 2000; Sorge and Gadanecz, 2008; Girrardone and Snaith, 2011 Looking at the statistical results of the previous literatures' regression outcome of the level of R-squared produced by the previous literatures, encourage this research paper to enquire within the micro and macro loan characteristics, to incorporate new explanatory variables relevant to the ASEAN-4 countries. Gaining insight from the previous literatures on the determinants of the project finance loan spread, this paper strives to address the posed research question "what are the cross-countries determinants of the loan spread and the project interest rate charged on the project finance". After scrutinizing on the regression outcomes of the previous literatures as well as the modelling approach

to answer their research question, beside this paper also makes an effort to learn the comprehensive depiction of the project interest rate charged on the project finance loan. This paper will subsequently expand the existing research scope by augmenting the aspect of deregulation effect in the ASEAN four countries as well as expanding the methodology to OLS analysis if plausible for the project finance loan spread and the project interest rate equal to LIBOR plus the project finance loan spread as the dependent variables.

This paper attempts to understand the factors behind the variation of loan spread in the different ASEAN four countries using the micro and macro loan characteristic variables, highlighting the political risk element as well as the novel variables to be incorporated in this paper. The R-squared results from the previous literatures partly motivate this paper to include other new variable with the possibility of improving the model explanatory power. Looking at the previous literatures, the relevant independent variables which will be utilized by this paper in the econometrics modelling, provide significant results yet do not yield a high R-squared outcome. This potentially means that the explanatory or independent variables correlates with the dependent variable however it does not explain much of the variability of the dependent variable. Following the previous literatures' regression results, this paper attempts to offer a comprehensive depiction of the project finance loan pricing, through the empirical examination of the ASEAN four cross-countries determinant factors driving the project finance loan spread and project interest rate charged on the infrastructure project attempting expanding the econometrics methodology tools beyond the previous studies. This

paper will undertake a thorough investigation with the following objectives: (i) to analyze the data and the perform OLS regression on the determinants of the project finance loan spread and project interest rate based on the previous literatures' model on the syndicated loan in the infrastructure sector: power and whole infrastructure sector; obtained from the Dealogic projectware and other data sources at the individual country level and then compare the four ASEAN countries with the time series data 1996-2016; (ii) to perform the regression analysis using the OLS statistical technique on the determinants of project finance loan pricing spread over LIBOR and project interest rate, on the set of micro and macro loan characteristics to analyse the ASEAN four cross-countries differential. The explanatory variables of the selected micro and macro characteristics from the World Bank, IMF and Central Bank, the disaggregate country risks factors from World Bank Governance Index (WBGI) with new variable contributions, deregulation and project interest rate as the dependent variable ; as a bid to fathom how these independent and dependent variables in the ASEAN four countries impact the project finance loan spread and project interest rate charged; which will be discussed in the chapter 3. For a note, the project interest rate charged is defined as the summation of the 6-month LIBOR and the project finance loan spread in basis point.

The characteristic of a project finance loan has a bearing on the how its loan spread is influenced by a set of micro and macro loan characteristics (Kleimeier and Megginson, 2000; Esty and Megginson, 2003: Sorge and Gadanecz, 2008; Girrardone and Snaith, 2011). While the variables' inclusion

criteria in this paper is based on their linkage with the infrastructure sector relevancy and multicollinearity risk consideration, as well as basing the previous research as the building block of this paper. The distinctive nature of project finance term structure, the loan maturity relationship with the loan spread, analyzed by Sorge and Gadanecz (2008) who suggested a hump shaped curve and no significant relationship linear relationship, which complements the empirical investigation outcome by Kleimeier and Megginson (2000). The presence of risk mitigant component in project finance, such as third-party guarantee or political risk guarantee offsets the political risk or corruption risk perception impact on the loan spread pricing. A further elaboration of the political risk factor at the disaggregated level is explored by Girrardone and Snaith (2011) which will be adopted by this paper. Hence, this paper predicts that the project finance loan spread as well as the project finance loan project interest rate are positively influenced by the political risk, number of banks, and sovereign credit risk perception element, GDP Growth, inflation, and LIBOR; while negatively influenced by the guarantee, loan maturity, loan size, and deregulation.

The distinct factors of this paper relative to the previous literatures are: (i) inclusion of additional variable which act as a proxy to deregulation; (ii) astute examination on the ASEAN four cross-countries differential allowance, through the OLS methodology application for project finance within the infrastructure space; (iii) additional dependent variable of the project finance loan interest rate; In short, this paper will employ new methodologies, dependent and explanatory variables relative to the previous empirical literatures, of OLS analysis framework

comparing the ASEAN four countries, which will be on the loan spread as well as the total sum of the loan spread and LIBOR dataset on the comparative study of the ASEAN four countries of Indonesia, Malaysia, Philippines and Thailand. The remaining of the study is comprised of chapter 2 which will review the existing literatures and hypotheses development, while chapter 3 which will discuss the methodology, research design and data used in this paper, then chapter 4 and 5 will discuss the results to be followed by the concluding section.

1.5. Limitations

The topic of project finance is unique relative to corporate finance, hence the theoretical literatures on the project finance topic is constricted. Similar to the previous studies by Kleimeier and Megginson (2001), Esty and Megginson (2001), Sorge and Gadanecz (2008), Thiery and Moor (2018), it is important to note that this paper will not focus on the creditworthiness, liquidity and leverage ratios matter due to the topic of project finance being as well as the data availability from data provider. Additionally, the methodology approach and variables to be explored by this paper beyond the previous literatures, is anticipated to encounter potential stumbling block as this paper progresses further in which this paper will adopt the trial and error in the addressing the potential hurdle. Also, this paper will primarily focus on the debt side of project finance, not the equity side due to the available stock of previous literatures and available data.