Comparative Analysis of Public-Private Partnerships in Different Countries: Case Study of Canada and China

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***Abstract*—Public-Private Partnerships (PPPs) have become an increasingly important tool in the development of infrastructure and public services as global economies and urbanization continue to evolve. The integration of private capital into the development of infrastructure and public services through PPPs has emerged as a strategy to alleviate governmental financial burdens while ensuring an effective supply of public services to the public. This paper provides an in-depth examination of the PPP model, exploring its various classifications and practical applications. Through comparative case studies of PPP implementation in Canada and China, the paper analyses the reasons behind the widespread adoption of PPPs by governments with differing political persuasions. It also addresses the benefits and inherent risks of PPPs, offering insights into their growing popularity and impact on global market dynamics.**

***Keywords*—Public-Private Partnerships (PPPs), government, Canada, China, political persuasions**

I. Introduction

With the economy's development and urban modernization improvement, Public-Private Partnerships (PPPs) have been applied in many countries. It is aimed at increasing the effectiveness of infrastructure projects by engaging in sustained public-private cooperation, and plays an important role in alleviating the shortage of public funds and promotes economic transformation to achieve high-quality development and facilitates the transformation of government functions and fiscal system reform (Pongsiri, 2002). Introducing private capital and attracting social funds to participate in the supply of infrastructure and public services through PPPs can reduce the financial pressure on the government and enable the public to have an effective supply of public services. PPPs can also generate market development space for growing private and social capital, allowing market participants to better exert benefits and innovation in the global market system. This paper aims to introduce the concept of the PPPs model and its classification, pracitices and uses the application of PPPs in Canada and China as cases to compare and analyze further why many governments of different political persuasions in various countries have accepted the PPPs model. This paper also discusses the advantages of PPPs and finds out the potential risks of PPPs to explain why PPPs can be widely spread worldwide in recent years.

II. Public-private Paternerships Model

A. Definition

The PPPs model initial appeared in the 18th-century European toll road development plan. However, its continued creation and spread are primarily ascribed to the private sector's participation in the marketization of public service, which is supplied as the core tenet of new public management movement (NPM) reform. In the 1970s, some countries, for example, the United Kingdom (UK), aggressively encouraged private sector involvement in the development and management of public projects (Shapely, 2013). Regarding the meaning of PPPs, there are different opinions according to various studies. Organisation for Economic Co-operation and Development (OECD) (2008) believes that PPPs refer to cooperation between public authorities, profit-making enterprises and non-profit organizations based on a certain project. Through such cooperation, partners could achieve more benefits than if they acted project alone. Some studies states that PPPs generally refer to a partnership between the public and private sectors, with the aim of delivering public projects or services that were once supplied by the public sector (International Monetary Fund, 2006; World Bank, 2015). Similarly, the Akintoye, Beck and Hardcastle (2008) believe that the PPPs are long-term contracts negotiated between government agencies and the private sector to supply public assets and public services. The private sector must carry material risks as well as managerial obligations. Although the concept of PPPs differs from many institutions and experts, and there is no consistent expression of PPPs, the definition of PPPs has some common features. The PPPs are essentially a model for linking the public sector, the business sector, professional organisations and the public society to provide public goods or services. Meanwhile, it needs to clarify the rights and responsibilities of all parties through contracts and carry out long-term cooperation on this basis. In addition, it also requires the public sector to formulate clear standards and carries out reasonable risk allocation and transfer.

B. Classification

PPPs model has many types, each has its own advantages and disadvantages. Therefore, classifying the PPPs model is important to understand why countries choose it later. Over the years, the public sector has traditionally used taxes and various levies to fund and operate infrastructure projects, such as fuel taxes, road user fees, and other aspects. Infrastructure procurement approaches are divided into two major groups, classic versus non-traditional (Ashworth, *et al.*, 2013). Traditional models divide the three subsequent phases of design, bidding, and construction (Babatunde *et al.*, 2014). As an illustration, consider the following: Build, Operate, and Transfer (BOT), Design, Build, Finance, and Operate (DBFO), Build, Operate, and Own (BOO). Specifically, the public authority grants the private party the right to design, fund, build, and manage the public asset for a predetermined time frame of approximately 30 years, following which the

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asset reverts to the public authority. PPPs can be based on availability or on concessions. Thereby, governments tend to choose PPPs model based on their reform objectives, political environment and industry financing needs.

C. PPPs in Different Countries

PPPs come in a gazillion varieties and are used all over the world. They have evolved into a sort of macroeconomic consensus (Otairu *et al.*, 2014). In the 1990s, the UK government encountered these challenges in public services: underinvestment in operation and maintenance of obsolete infrastructure, the construction of new infrastructure, significant time and cost overruns in traditional procurement models and inefficiencies in public services. After consideration, the UK government has pushed ahead with the Private Finance Initiative (PFI), the most typical PPPs approach in the UK. Successful examples of PPPs project relationships are sufficient, from the city of Sacramento, California, working with telecom giant Verizon to enhance its infrastructure with cutting-edge technologies to India adopting PPPs to modernize its airports. But there are also examples of failed PPPs projects between governments and investors, from the breach of the Don Mueang Highway Compact in Thailand in the late 20th century to the failure of the London Underground upgrade in the early 21st century. Nevertheless, there is no denying that when PPPs work well, they can be effective in addressing limited government budgets and legacy infrastructure for the greater good. Specific examples are then used to explain why governments of different political persuasions can embrace PPPs.

III. Case Analysis

A. Adoption of PPPs in Canada

The PPPs model adopted by Canada in recent years is mainly based on DBFO rather than transferring core public services to private operations. Since the early 1990s, the rise of the NPM movement has affected how the Canadian government provides infrastructure and public services, and the innovative PPPs model has been introduced into Canada. After nearly 30 years of development, the PPPs model in Canada has become one of the most mature markets in the world. Canada has a complete legal system framework and a sound regulatory mechanism, which are at the forefront of the development of PPPs in the world.

The Canadian PPPs model is one of the most effective public policies in its country to solve many problems. It addresses aging infrastructure, significantly underinvested and fiscal deficits. Many public buildings in Canada represent a mid-20th-century legacy, such as urban transportation, airports, ports, hospitals, schools and a host of other public buildings (Benton-Short and Lewis, 2016). Because Canada underwent a dramatic infrastructure and public building expansion between the 1950s and 1970s, resulting in an enduring public infrastructure network. However, in the 21st century, the passage of time and the damaging factors of global climate change have taken a toll on the infrastructure. On the other hand, technological advances and changing Canadian living patterns have changed the demands on the original social infrastructure. In addition, changing demographics and environmental concerns, combined with factors such as the competitiveness and productivity needs of the national economy, also increase the urgency of economic infrastructure reconstruction. While public finances are constantly under pressure, the Canadian government must quickly invest funds to repair and protect the construction. The emergence and application of the PPPs model reduce the difficulty of Canada’s infrastructure funding shortage.

There is a positive correlation between Canadian public infrastructure and productivity. There are three effects of public capital investment in Canada (Tarkhani and Harchaoui, 2003). First of all, public capital investment has reduced the production costs of the 37 industries studied in Canada to varying degrees, which is the “productivity effect” of public capital. Secondly, with the reduction of production cost and selling price, the enterprise has a higher sales volume, and then there is an “export effect.” Finally, enterprises increase investment in labor, capital, and product upgrades, exerting the “indirect effect” of public capital. According to Table 1, the total economic impact of Canada’s cumulative infrastructure investment in 2023 is $88,554 million, increasing employment by 665.2 thousand jobs and providing wages of $55,129 million, which is a great increasing compared past four years. Canada’s infrastructure investment is one of the most powerful and scalable tools that can stimulate investment, achieve economic stabilization, and have both short-term and long-term economic impacts. Investments in infrastructure create jobs and stimulate the economy in the short term, laying the groundwork for competitiveness, growth, and productivity in the long run. The government’s active and reasonable application of the PPP model allows it to demonstrate stability and continuous productivity in the economic crisis.

Table 1. The total impact on infrastructure investment in Canada from 2019 to 2023

	2019	2020	2021	2022	2023
Direct Impact	$34,476m	$35,185m	$37,550m	$44,422m	$48,427m
Indirect Impact	$27,761m	$28,897m	$30,679m	$36,614m	$40,128m
Total Economic Impact	$62,237 m	$64,082m	$68,229m	$81,036m	$88,554m
Jobs Added	(1.9)k	19.1k	(12.4)k	97.2k	56.5k
Compensation of Employment	$38,312m	$39,641m	$42,314m	$50,412m	$55,129m

Source: Infrastructure Statistics Hub

Canada’s application of the PPPs model has given full play to the advantages of the public and private sectors, established a long-term partnership of mutual integration, and brought efficient, effective, and fair infrastructure and public services to residents’ lives and economic production. Due to the small scale of the project and the influence of political risk factors, the Canadian PPPs model faces development restrictions from local governments (Siemiatycki, 2015). For the government departments, they need more professional technology and regulatory capabilities, and the PPPs model needs to address better the balance between municipal infrastructure needs, investment, and management capabilities.

B. Adoption of PPPs in China

In 2014, China officially accepted the PPPs model concept, and the BOT model is most applied in the country. As can be seen in Fig. 1, China's PPPs have developed rapidly since 2014. In 2017, the government issued several policies to regulate the PPPs project to strengthen supervision. A large-scale clean-up of PPPs projects was completed in 2018, which decreased the number of retired projects. On the contrary, they have fallen rapidly since 2020 count of the COVID-19, indicating that the development of PPPs still faces severe tests and challenges, and this is also because the government standardizes the PPPs model during this period. By 2023, PPP projects investment transacted in China, with a total investment of RM40.383 billion. In total, PPPs investment in China continuously increase in recent 9 years except in 2020, but the projects decreased in recent 4 years.

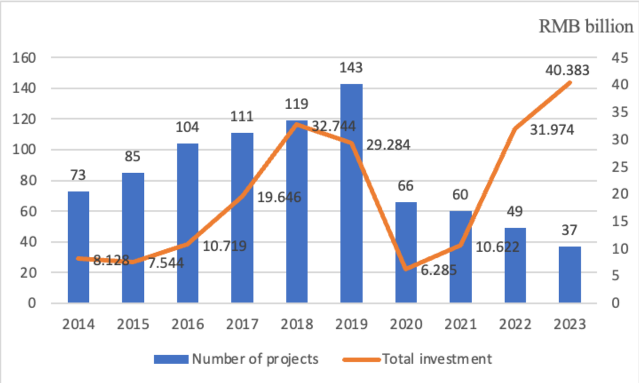

Fig. 1. Annual PPPs projects number and investment in China from 2014 to 2023.
Source: World Bank PPI Database

At present, China's PPPs model is mainly applied to projects such as the exploitation of natural resources, public infrastructure construction and public utilities. In 2021, the unbalanced development trend of PPPs projects between regions continued. The southwest region has a large demand and a low level of implementation, but the implementation projects have accelerated and the eastern region's demand is relatively small, and the landing situation is better than in other areas (Zhang *et al.*, 2018). In the face of the impact of the new pneumonia epidemic on China's economic and social development, the government introduced a "combination of policies" to actively expand effective investment and attract social capital to participate in PPPs and make a great profit for the people. Combined with China's phased characteristics, PPP may make an important contribution to the overall deepening of reform. Mixing public, non-public, state-owned and non-state-owned equity in lieu of subdivision to achieve maximum inclusiveness, promote and achieve effective supply, and thus release, its model is a form of mixing the relative advantages of multiple parties in a complementary manner, achieving a win-win situation and sharing risks.

C. Inspiration

The PPPs model has matured in some countries like Canada, but it is still developing in most developing countries, like China. There is no doubt that these countries, include Canada and China, benefit from adopting PPPs for infrastructure development. Undoubtedly, this will improve the living standards of citizens because the government will better spend taxpayers' money. In addition, it will ensure the continued business of well-organized contracting companies while creating more job opportunities for people, building human capacity, and improving sanitation community engagement to have sustainable development for a country.

However, processes, procedures and supporting institutions of PPPs are major barriers to expanding their use (Draxler, 2008). For many governments, a lack of effective governance and well-performing institutions is represented in a number of ways, including protracted talks between public and private partners, delayed closures, inflexibility in risk sharing, and the elimination of many projects that create all of the waste. The task for them is to establish public skills to manage projects in addition to new institutions. PPPs require a strong public sector that can play new roles with new capacities. Therefore, the strong PPPs model requires proficient managers in negotiation, contract management, and risk analysis.

IV. Discussion for Adopting PPPs

A. Advantages of Using PPPs

According to the above PPPs cases with different political persuasions and data carried out in cross countries with different political backgrounds and previous studies, PPPs model mainly has the following three advantages in common.

Firstly, PPPs can make up for the funding gap in public infrastructure construction and public service delivery (Hellowell and Pollock, 2010). Applying PPPs will help obtain kinds of research outcomes, accelerate technological advancement, assist in addressing the issue of inadequate funding for scientific research, and encourage the dissemination of current findings. Because using PPPs can contribute to the release of cash for the private sector, take part in the development of top-notch infrastructure, and share risks. Moreover, PPPs also help improve management efficiency and reduce infrastructure construction and operating costs. It also disseminating private sector technological achievements can be facilitated by applying and developing new technologies in PPP projects.

Secondly, PPPs have positively impact on society (Fabre and Straub, 2023). PPPs are regarded as an alternative tool for public sector action, and private sector participation can, to some extent, increase production efficiency while ensuring effective economic allocation. In addition, PPPs could provide high-quality public services and improving national competitiveness. PPPs can promote economic development as a flexible and effective mechanism.

Thirdly, PPPs can improve the operational efficiency of the private sector and related projects (Berrone *et al.*, 2019). Applying PPPs can reduce information asymmetry and increase investment efficiency by lowering the uncertainty of the private sector's future cash flow and increasing the transparency of its outside financing. The PPPs are an effective tool to provide high-quality public services and are conducive to sharing project risks among parties with the ability to manage risks.

B. Risks of Using PPPs

Although PPPs have many advantages, their application may bring certain risks. It can be concluded as follows:

First, PPPs projects' cost and potential risk are relatively high (Hwang *et al.*, 2013). The establishment and management of PPPs projects are often accompanied by high transaction costs, directly or indirectly hurting the overall efficiency gains. On the one hand, potential bidders may be afraid to bid if the project bidding cost is too high. On the other hand, some PPPs projects need to rely on high loans from banks, which brings higher risks to private companies.

Second, more than using PPPs alone is needed to make up for the lack of capacity of public institutions (Mahalingam, 2010). The implementation of PPP projects requires supporting public institutions and legislative arrangements, and PPPs will blur the boundaries between the roles of the public and private sectors. Without clarity on the respective roles of public and private partners, there is a risk of subsidizing private interests with public funds and undermining public sector capacity.

Finally, some PPPs projects may be built to avoid debts (Liu *et al.*, 2020). Due to problems such as information asymmetry and insufficient transparency of implementation methods, the expected effects of PPP projects will be offset by existing defects. In addition, some countries use PPPs because accounting rules allow project costs to be removed from public agency accounts to show lower debt levels.

V. Conclusion

This paper describes the definition, types and essential practices of PPPs. It uses specific application cases in Canada and China to find out how PPPs apply so quickly in many countries where governments have different political persuasions. Based on the analysis, it can be found that the PPPs are a long-term relationship between the public and private sectors to deliver an output.

In general, using the PPPs has more benefits than risks for a country's economic development. Since many governments cannot and are not good at social or community work, while entering the era of the knowledge economy, the extraction and allocation of resources should be carried out efficiently. The government is responsible for policy formulation and planning and implements policy implementation in civil communities or the private sector. Applying the PPPs will not only reduce the long-standing financial burden of the government, but also community and public power can be introduced into the process of public services to strengthen civic and social awareness and identity, as well as improve resource use efficiency and construction and operation. Although there are some risks with the PPPs, more and more governments are cooperating with the private sector to create sustainable infrastructure, bringing together all parties of PPPs to make profits.

Conflict of Interest

The author declares no conflict of interest.

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