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# Sources of finance for public-private partnership (PPP) in Poland

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Central European Economic Journal

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# Sources of Finance for Public-Private Partnership (PPP) in Poland

**Abstract**

This paper aims to present and discuss the already existing studies and try to uncover possible potential for further research on the topic of financial resources in public–private partnership (PPP) projects. The article presents the main relevant papers regarding financial resources and examines how deep the topic of financial sources has been explored in both academic and practical literature. Moreover, the article reviews Poland's PPP market and, particularly, types of used financial sources. The 'Literature review' results show that there is a gap in studying the private sector and financial resources, especially in Polish PPPs. We attempt to close this gap by summarising the main factors that influence the choice of the source of financing PPPs. The Polish case shows that the main source of financing of PPP projects in Poland is bank loans and many projects have partial funding from various European Union (EU) programmes. Policymakers should pay attention to other financial resources in PPPs. Moreover, it would be fruitful to extend the Polish database of PPP projects with new factors that can simplify ex-post and ex-ante analysis.

**Keywords**

public-private partnership | financing source | capital market | finance | source of finance

**JEL Codes**

G10, G15, G29

## 1 Introduction

The private sector has provided a significant part of public services in recent decades. Moreover, according to European Investment Bank (EIB) (2021) 'it was the corporate sector that provided the impetus for the recovery from the global financial crisis' (p. 69). The private sector provides around 45% of total infrastructure investments in the European Union (EU), which is 0.7% of the EU gross domestic product (GDP). The total value of public-private partnership (PPP) transactions has been stable for 10 years and the value per project has increased (EIB, 2019). From 2010 to 2019, the average value of PPP transactions was more than 15 billion EUR. The total value of PPP transactions in the EU reached a peak in 2013 with more than 20 billion EUR. According to the 2019 EIB market update, 2019 was the lowest year in PPP provision. In 2019, slightly more than 40 PPP projects reached financial close with a total value of investments around 9.8 billion EUR.

Currently, one of the most important issues is how to use the limited resources available most efficiently and correctly, especially financial resources. PPP seems to be a good solution for the public and private partners. In PPP, both partners try to achieve their own purposes. The public sector achieves modern and effective infrastructure objects at the lowest possible cost and the lowest possible engagement of budget. On the other hand, private business looks for long-term profits from investing funds in projects with government liabilities and with stable flows throughout the entire period of a project. Generally, there are five main critical success factors for PPP in a research review, such as appropriate risk allocation and sharing, a strong private consortium, political support, community/public support and transparent procurement (Cui et al., 2018;Osei-Kyei & Chan, 2015).

In academic literature, most of the studies consider PPPs from the government point of view and especially fiscal determinants (Geddes & Wagner 2013; Chen, Daito, & Gifford 2014; Wang & Zhao, 2014). Therefore, it can be fruitful to review this topic mainly from the private sector and their decision-making about financial sources for PPPs because the main objective of a PPP is to engage the private sector with its

managerial skills, technologies and financial resources in huge infrastructure projects. At the same time, there is great demand for public infrastructure and services worldwide, including in Poland. Therefore, since 2009, Poland has realised PPP projects and local governments have signed over 100 contracts (about 300 contracts were planned).

The core idea of this paper is to review the world experience, to examine how deep the topic of financial sources has been explored in both academic and practical literature, to review Poland's PPP market and, particularly, types of used financial sources. There are different sources of financing for PPP projects. Generally, we can categorise these sources into three groups: public financing, corporate financing, and project financing. Therefore, a significant part of PPP projects is financed by different debt instruments. Thus, the capital market and availability of financial resources for the private sector are significant parts of investigations of PPPs.

This article attempts to present and discuss already existing studies on similar problems and tries to uncover possible potential for further research on the topic of financial resources. The Polish experience in the implementation of PPP projects is interesting as a case study in the scale of global PPP. The remaining part of the paper is the following: 'Literature review' presents the main relevant papers regarding financial resources in the existing literature, and 'PPP market in Poland' presents the Polish market. We start with fundamental books and articles about PPP, then we investigate how the problem of financial resources for PPP projects is recognised in academic literature. The section 'PPP market in Poland' includes information about the database mainly about the Polish PPP market, existing capital market, and accessible sources to finance PPP projects. Additionally, this section discusses the Polish case and their specific use of financial resources helps us to define room for improvement for further investigations.

# 2 Literature Review

Different countries have an infrastructure gap, especially developing countries. Walker and Smith (1995) observed that the private sector can raise massive funds for large-scale construction projects, thus reducing the host government's financial burden. The huge infrastructure gap in many countries cannot be provided by the government alone from the national budget, which would put a large amount of pressure on the financial status of the government. Therefore, governments need to engage private investors that have the capabilities of raising substantial funds for large-scale infrastructure projects. PPP projects are successful partnerships notably for large infrastructure projects due to advanced technology provided by the private sector. PPPs are usually complex arrangements between multiple stakeholders with competing goals over a long period of time and financing of PPP projects requires long-term resources. In this regard, the focus is mainly on the private sector, which is the main partner of PPP projects. The literature review begins with financial systems and further strives to distinguish financial sources depending on capital structure approach (origin), frameworks of project realisation, models and stages of PPP projects, and financial institutions. Guidebooks, and practical and academic literature with empirical results are the main literature for the paper. Because there are no strictly similar papers on sources of financing in PPP, the main idea of the literature review is to summarise the knowledge and categories of financial sources.

## 2.1 Main financial system concepts

A PPP project is part of a financial system. The financial system of a country can help define types of financial sources. The capital flows discussion uses two main financial system concepts such as market-based and bank-based financial systems. In the academic literature, there is no clear consensus or clear definition of what market-based and bank-based economies are all about. However, the main classification we can find in Levine (2002) is based on empirical studies covering large samples of developing and low-income countries. Market-based financial systems are economies in which direct financing through financial markets prevails. Bank-based financing provided via financial intermediaries prevails (NBP, 2013). Levine (2002) discusses that in general there is not an issue or reason to divide a financial system, but to 'create an environment in which intermediaries and markets provide sound financial services'(p. 400). According to the results of papers by Bijlsma and Zwart (2013), we know that Poland belongs to countries with both the banking sector and financial markets together. Other such countries are Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania, Slovakia and

Slovenia. Countries that are traditionally market-oriented include the United States, the Netherlands, the UK, Belgium, France, Finland, and Sweden. Countries with bank-oriented systems include Austria, Denmark, Germany, Greece, Italy, Portugal and Spain (NBP, 2013; Blavy, 2011).

Some research after the financial crisis argues that the financing of long-term infrastructure projects has been evolving from mere 'bank-based' to 'market-based' approaches (Jacobsson & Jacobsson, 2012). Infrastructure projects require long-term financing, which means long payback periods. In terms of the financial system, if the country has a relatively developed local capital market, potential investors can access financing in the domestic currency to be repaid by the project's revenue, thus protecting them from the exchange rate risk. PPP projects require long-term institutional investors such as pension funds or insurance companies that are willing to invest in infrastructure projects (Emirullah & Azam, 2014).

## 2.2 Capital structure of PPP projects

Research on the capital structure of PPP projects considers the source and structure of equity and debt funds. According to Du, Wu and Zhao (2018), there are two categories of critical factors of capital structure: internal and external. External critical factors consider all conditions of the capital market. Moreover, the decision-making process about capital structure should be based on the estimation of the current situation in the capital market (Regan et al. 2013). Furthermore, industry condition demonstrates the current positions of different investors and creditors (Atmo & Duffield, 2014). Capital structure that suits the preference of the capital market and follows the trend of the industry can provide vast funds for the construction and operation to assure the long-term successful operation of PPP projects. The decision to raise funds to finance projects and operating costs largely depends on the capital structure or ownership. Man and Jurčíková (2015) divide the financial recourses according to the origin (internal and external) and the ownership relationship (equity and foreign). Private companies primarily decide which source to use for projects based on cost expectations (the costs of each type of capital). Consideration of an optimal capital structure will help determine what proportion of the rights and functions the state and private partner should be. This largely affects the decision on funding sources. Furthermore, the agency costs will directly influence the decision on attracting funding decisions (Martimort & Pouyet, 2008). An empirical study by Rao (2018) argues that commercial banks more regularly invest in PPP in countries achieving minimum macroeconomy conditions such as GDP per capita growth and total debt over GDP ratio. From the bank's point of view, they should fulfill Basel III capital standards. The stability of PPP projects depends on construction, economy, society, environment, and management (Zhang, Wang & Wu, 2017). Trends and conditions of capital markets influence financing investment projects and PPPs. The capital structure studies highlight debt and equity of financial sources for PPPs that depend on funds ownership and the choice in favour of a particular source followed by external factors.

## 2.3 Source of finance depending on the framework

Many studies (Weber & Alfen, 2010; Khmel, 2016; Moro Visconti, 2013) define two ways of PPP provision: corporate finance and project finance. These frameworks determine the use of different financial sources for PPP projects. According to Roberto Moro Visconti (2013), investors use the corporate finance framework for projects that last under 20 years, and the project finance framework for projects that last over 20 years. Corporate finance uses operating or service companies working in the infrastructure sector from the investor balance sheet. Implementation of PPP projects with project financing needs 'a special purpose company (special purpose vehicle), cash flow-based lending, a risk-sharing structure, limitation of liability and off-balance sheet finance' (Svědík & Tetřevová, 2012). 'Efficiency considerations suggest that ownership of the special purpose vehicle that is a limited liability company providing the public service does not have to be exclusively public or private. An optimum investment in public infrastructure requires mixed public and private ownership and governance of the project and knowledge transfer' (Moszoro, 2014). The special purpose vehicle should enable public and private sector clients to establish a more efficient financial framework for infrastructure projects. According to official HM Treasury information from 2007, in the UK a special purpose vehicle is typically highly leveraged through 80–90% debt and 10–20% equity, both provided by the member companies (in

**Tab. 1.** PPP models

| Sector | Country | PPP models |
|---|---|---|
| Transport | Australia, Canada, France, Greece, Ireland, Italy, New Zealand, Spain, the UK, the US, India | DBOM (DBFO), BOOT, Divestiture |
| Water, wastewater, and waste | Australia, France, Ireland, the UK, the US, Canada, India | DB, DBO, BOOT, Divestiture |
| Education | Australia, Netherlands, the UK, Ireland, India | DB, DBO, DBOM, BOOT, DBFO/M, integrator |
| Housing/urban regeneration | Netherlands, the UK, Ireland | DBFM, joint venture |
| Hospitals | Australia, Canada, Portugal, South Africa, the UK | BOO, BOOT, integrator |
| Defence | Australia, Germany, the UK, the US | DBOM, BOO, BOOT, alliance, joint venture |
| Prisons | Australia, France, Germany, the UK, the US | DB, DBO, BOO, management contract |

Source: Based on Adapted from Deloitte, by Eggers & Startup, 2006, p. 20.BOO, build-own-operate; BOOT, build-own-operate-transfer; DB, design-build; DBFM, design-build-finance-maintain; DBFO, design-build-finance-operate; DBFO/M, design-build-finance-operate/maintain; DBO, design-build-operate; DBOM, design-build-operate-maintain; PPP, public-private partnership.

some cases, public institutions may contribute through grants or loans) (Biondi, 2011).

## 2.4 Financial sources depending on PPP models

Additionally, in the literature, we can find two sides to the financial efficiency of PPP in the context of the cost of debt. Most critics of PPP argue that the cost of debt in PPP is typically higher than the cost of public funds. For instance, a Design-Build-Operate (DBO) can be more efficient than a Design-Build-Finance-Operate (DBFO) because of a needless increase in costs of private financing (Blanc-Brude & Strange, 2007). The most common PPP models are Design-Build (DB), Design-Build-Maintain (DBM), DBO or Build-Transfer-Operate (BTO), Design-Build-Operate-Maintain (DBOM) also known as Build-Operate-Transfer (BOT), Build-Own-Operate-Transfer (BOOT), Build-Own-Operate (BOO) and Build-Own-Operate/Maintain (DBFO, DBFM or DBFO/M) (Table 1).

Table 1 shows that the UK is present in all PPP sectors. According to the country breakdown by Rao (2020), the leaders of infrastructure for several projects are the US, India and the UK. We can note the correlation with the PPP market update prepared by the EIB (EIB, 2019) for Europe, where the most active market was the UK in terms of project value, and France in terms of the number of projects. In the period 1996–2009, a total of 663 PPP projects were signed in the UK and around 10% used bond financing, while the rest used bank loans. Likewise, in the European PPP Expertise Centre (EPEC) report, we can find that the Netherlands and France are also the most potentially perfect markets for financing PPP projects with bonds because of their substantial pension scheme. However, Europe has shown less enthusiasm for PPP bond financing (EPEC, 2010). In the US, PPP project bonds have been promoted by the government through certain programmes such as the Transportation Infrastructure Finance and Innovation Act (TIFIA), and Private Activity Bonds (PAB). Canada is also presented as a country that uses PPP financing bonds (Mallett, 2017). Moreover, the UK and Spain mostly use transport PPP projects (DBFO). The main financial resources in the analysing period from 1999 to 2014 were third-party loans with around 71.9% in Spain and around 79.6% in the UK in 2014. The equity share is around 14.4% for Spain and 19.1% for the UK, with a share capital of 13.7% and 1.3%, respectively (Acerete, Gasca, & Stafford, 2019). According to a report prepared by Cambridge Economic Policy Associates (CEPA) that considers the infrastructure project sample from 2010 to 2016, road projects have the highest debt-to-equity ratio around 93%, where Greenfield projects 69% in comparison with Brownfield projects where this ratio equals

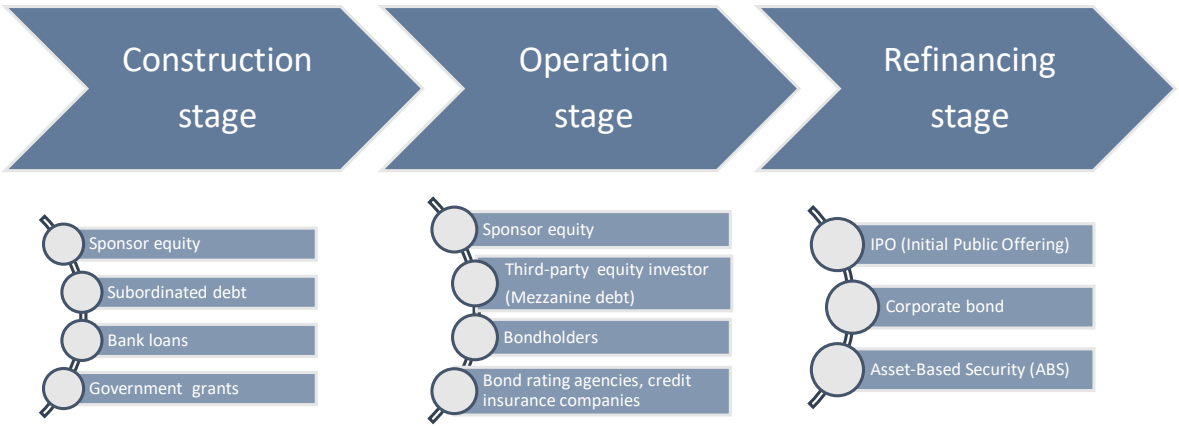


**Fig. 1.** Sources of financing by PPP stages. PPP, public-private partnership

to 81%. Moreover, bonds are used mainly in road projects and for refinancing existing projects (CEPA, 2017). According to the China PPP survey, BOT is the most popular procurement system among all PPP types, with a percentage of 43.04%. At the same time, BTO and DBFO are highly common in China with a percentage of 15.19% and 13.92% respectively (Liang & Wang, 2019).

## 2.5 Source of finance depending on the project stage

According to Engel, Fischer & Galetovic (2014), the source of finance is different during the lifecycle of PPP and is connected with changing risk structure and incentives. Depending on the project's stage, the best-fitted sources of finance are used. Each level of project implementation is linked with a particular fund. For instance, in the construction stage, the riskier stage, the bank loan is more preferable, because banks can control spending. When the projects are launched, bonds can replace loans. This source distribution per stage has been perfectly illustrated by Engel et al. (2014) (Figure 1).

Cheng (2013) likewise mentions that the uncertainties occurred mainly during main project stages where main project costs appear: construction and operation period, and construction and operation costs, respectively. Moreover, the author considers that funds for PPP consist mainly of three parts:

> primary investment (including civil works, equipment, energy, etc.);
>
> unforeseen costs, which are basically changes of the primary investment under the changing of economic environment;
>
> project financing costs.

Infrastructure projects require long-term financing, which means long payback periods. If the country has a relatively developed local capital market, potential investors can access the financing in the domestic currency to be repaid by the project's revenue, thus protecting them from the exchange rate risk.

There is no research regarding financial sources for PPP projects. Moreover, there is no clear cross-country analysis regarding financial sources for PPP projects. However, Rao (2020) presents general information about infrastructure investments in the latest analysis of the financial structure of infrastructure deals. More than 75% of all infrastructure projects use loans, 45% of the sample use other debts, followed by equity at about 25% of the sample, and lastly bonds at about 9% of the projects. Other debt includes credit facility, letters of credit facility, revolving credit and bridge facility, plus other less common facilities. The annual report of the World Bank describes global trends of PPI and capital structure for PPP projects in emerging countries. At around 70%, debt is the most popular source of financing, with private equity around 25% and subsidies around 5%. An interesting fact is that 55% of this debt is international, and 15% is local. According to a report, the Development Finance Institution (DFI) played an increasing role in 2017 (The World Bank, 2020). Cuttareeand and Mandri-Perrott (2011) noted in their research that most

projects finance to maximise gearing. Debt-to-equity ratios of 75/25 or 70/30 have been common.

As mentioned above, the investor equity in PPP project financing is around 20-30% of all investments. In a special purpose vehicle, capital is provided by 'an investor in exchange for shares, representing ownership in the company or projects' (Yescombe, 2013; Deloitte, 2018). Government agencies (project initiators) can hold the role of equity providers, local investors, institutional investors, or granters, while equity is sometimes provided by several equity investors. An interesting feature of equity capital is 'equity investment first in and last out' (Farquharson, Torres de Mästle, & Yescombe, 2011). In fact, creditors suffer only when a project loses the equity capital.

Debt equity can be obtained from commercial banks, institutional investors, bilateral or multilateral organisations (Weber & Alfen, 2010). Debt financing is mostly provided through bank loans 'typically from large banks with experience in PPP' (Woodman, 2006). According to Cuttareeand and Mandri-Perrott (2011), PPP projects tend to maximise debt financing because it is cheaper than equity. The main debt financial instrument is senior debt providing with bank loans and bonds, and subordinated debt providing with the subordinated loan, bond, mezzanine credit, leasing, etc. The loan is the main financing resource for the construction and operation phase and more flexible in comparison with bonds. In general, interest rates are based on LIBOR or EURIBOR. Infrastructure debt is a fixed-income product for investors and infrastructure projects divided into greenfield and brownfield projects. Greenfield projects include project loans and project bonds, and mezzanine debt. The brownfield projects use long-term bonds linked to an infrastructure company (OECD, 2015). According to the definition by the Organisation for Economic Co-operation and Development (OECD), 'mezzanine loans are subordinate tranches of debt often used in project finance to provide credit enhancement for senior debt tranches'. This instrument is considered as capital on the balance sheet of the project company. Mostly it is treated as debt instruments and has both equity and debt characteristics with higher risk, and pays higher yields than senior issues (OECD, 2015). Mezzanine financing for project finance transactions can be obtained from shareholders, commercial lenders, institutional investors, and bilateral and multilateral organisations (World Bank Group, 2020). Generally, it can be divided into two main types of mezzanine finance instruments: private mezzanine instruments and public mezzanine instruments. Private mezzanine instruments are divided into subordinated loans (junior debt) and participating loans. The public mezzanine instruments include the following convertible bonds, bonds with warrants, and profit participation rights (Tetrevova & Svedik, 2013).

Initial Public Offering (IPO) according to Yescombe (2013) can be an additional way to use sources of capital market and develop additional funding. PPPs can sell shares to financial investors 'who can be attracted by rate on investment available over the remaining term of the project '(Demirag, Khadaroo, Stapleton & Stevenson, 2010). High liquidity of the stock market is an advantage, but at the same time, different kinds of financial crises can ruin PPP projects.

Asset-Based Security (ABS), in the case of PPP financing, is a financial instrument that pools contractual debts (usually loans) for pooling and selling to investors through the capital market to finance PPPs (Linh, Wan, & Thuy, 2018). It is worth noting that ABS creates the ability to transform a group of non-liquid infrastructure loans into tradable securities. This transformation also has other dimensions, such as credit quality and loan tenor (OECD, 2015).

## 2.6 Financial institutions

In general, all financial institutions that provide funds to PPPs can be classified as international, national, regional banks and international financial institutions. International financial institutions play a crucial role in financing PPPs. The public sector or private partner can get financial resources at lower rates. The World Bank is a global financial institution that finances PPPs only if a country uses PPPs mainly through guarantees for borrowing through the International Bank of Reconstruction and Development (IBRD) (Hall 2015). Moreover, there are state-owned development banks that act not only in their home country but also internationally, such as the German KfW, the French Agence française de développement (AFD) or the Japanese Bank for International Cooperation (JBIC). In Europe and commercial banks, private partners can involve loans from EIB that are presented as hybrid PPP projects (Van der Geest & Nunez-Ferrer, 2011). The main financial instrument for EIB are loans, equity and fund investment, and blending (guarantees, technical assistance, first loss pieces, etc. in combination with concessional financing). Larger

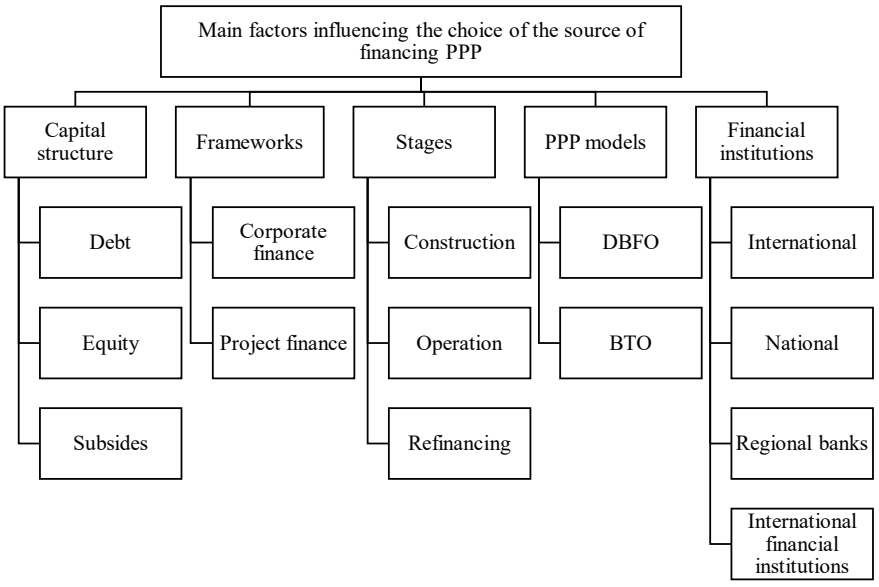


**Fig. 2.** Main factors influencing the choice of the source of financing PPP. PPP, public-private partnership

projects can be financed either directly or indirectly through a government or financial intermediary (Mogyorósy, 2019).

The European Commission proposes additional incentives for the use of financial instruments for territorial infrastructure. For its part, EIB plays a significant role in financing different infrastructure initiatives. EIB complements EU budget funds and private investments by providing additional range and flexibility to the use of the existing financial resources.

The following are among the financial instruments that can have an important impact on the increase of PPP implementation in the EU budget for the period of the multiannual financial framework (MFF) 2007–2013:

> Cohesion for Growth and Employment: Joint European Support for Sustainable Investment in City Areas (JESSICA), Joint European Resource for Micro to Medium Enterprises (JEREMIE) and Joint Action to Support Microfinance Institutions in Europe (JASMINE);
>
> Competitiveness for Growth and Employment: the Loan Guarantee Instrument for Trans-European Networks Transport (LGTT).

PPPs are specifically addressed in Article 19 of Horizon 2020 as a tool to implement research and innovation (R&I) activities of strategic importance. The PPPs can be implemented either as 'Article 187 PPPs' (TFEU) or as 'Contractual agreement PPPs'. Generally, private and public partners can get support from a variety of EU sources, such as:

> European Regional Development Fund (ERDF);
>
> EU Cohesion Policy;
>
> The Operational Programme Infrastructure and Environment (OPI&E);
>
> EU's Competitiveness and Innovation Funds (CIP): Horizon 2020 (replacing the 'Framework Programme' (FP)) and Competitiveness of enterprises and small and medium-sized enterprises (COSME):
>
> JESSICA;
>
> European Local Energy Assistance (ELENA).

'PPPs can help leverage R&I elements and make the industry more strongly commit industry to joint objectives' (China Academy of Information and Communications Technology & EU-China Policy Dialogues Support Facility II, 2015).

**Table** 2 presents a summary of the literature review. There are many studies in the literature investigating PPP projects, but not many specified on financial resources. Many studies briefly mention the financing side of PPPs and do not distinguish financing resources by different criteria, such as project stage, financial system or PPP model. There is a gap in studying financial resources, especially in Polish PPPs. Additionally, Figure 2 summarises the

**Tab. 2.** Literature review and contribution of main papers

| Type of literature | Authors | Contribution |
|---|---|---|
| Empirical study | Rao (2018) | Empirical study that investigated PPP mainly from the private perspective, realization PPP by project finance and the increasing importance the role of guarantees in catalyzing finance, both through banks and bonds. |
| Empirical study | Rao (2020) | The use of capital market instruments to finance PPP infrastructure projects. Analysis of infrastructure projects by sources of finance. |
| Empirical study | Engel, Fischer & Galetovic (2014) | Investigation of ideal PPP contracts and distinguishing sources of finance by project stage. |
| Empirical study | Jian-cheng, Xi-shuang, Ping-mei & Jiao-ju (2013) | Determine optimal capital structure for the decision-making basis for investor, loaner, and governor. |
| Empirical study | Emirullah & Azam (2014) | Empirical conclusions about the influence of investment climate on PPP arrangement in ASEAN countries. |
| Empirical study | Acerete, Gasca, & Stafford (2019) | Investigation of DBFO and ex-post evaluation of road PPP projects with analysis of debt and equity financial resources. |
| Case Study | Regan, Love & Smith (2013) | Review Australian case of PPP implementation with attracting debt and equity finance in regard with market condition. |
| Case Study | Man & Jurčíková (2015) | Theoretical distinguishing of financial sources PPPs used in the Czech Republic. |
| Theoretical research | Du, Wu & Zhao (2018) | Critical factors about capital structure, the relationship between factors, and the capital structure of a PPP project. |
| Report | EIB 2019, EIB 2021 | Review of the European PPP Market and Investment report prepared by the leading financial institution: The European Investment Bank |
| Report | OECD (2015) | Taxonomy of instruments and vehicles for infrastructure financing. |
| Guidebook | Eggers & Startup (2006) | Main PPP models employed by countries. |
| Guidebook | Yescombe (2007),Weber & Alfen (2010) | The PPP guidebooks for public and private sectors. |

main factors that influence the choice of the source of financing PPPs.

# 3 Public-Private Partnership Market in Poland

For this review article, many databases were used to review the financial sources involved in PPP in Poland. To get a general view of the number and value of implanted PPP projects, we used the PPP Platform database of implemented PPP projects in Poland that was established by the Ministry of Infrastructure and Development. All projects are nominated in PLN and were exchanged to EUR with average exchange rates. Further, we divide projects according to the source of financing distinguishing loans, bonds, shares or EU financing in projects. We then review several projects that reported financial sources used in a particular PPP. The Eurostat database provides figures regarding gross fixed capital formation (GFCF) for comparison with the total value of PPP investments in Poland. For the sake of reviewing current trends on loan and bond markets, we use data from Narodowy Bank Polski (the

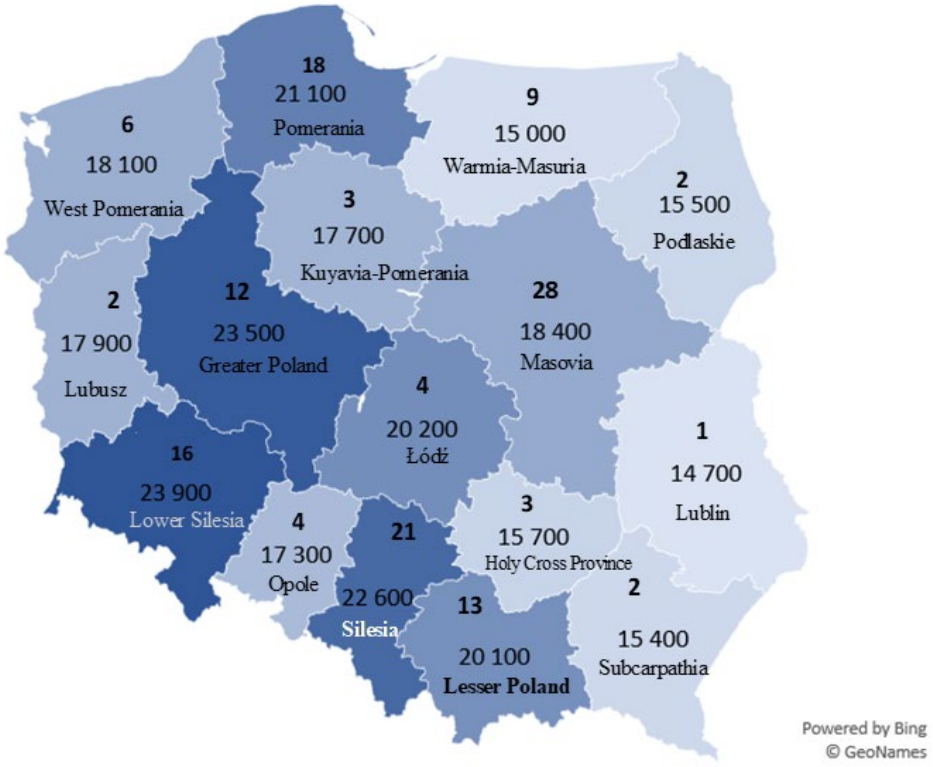


**Fig. 3.** Number of PPP in 2009–2020 with Poland GRP per capita 2018. GRP, gross regional product; PPP, public-private partnership

central bank of the Republic of Poland) and Catalyst data, respectively.

The PPP market in Poland is relatively young and developing. After a new law on PPP was introduced, 144 projects worth 1.75 billion EUR were realised. The distribution of projects in Poland in the year 2020 is presented in Figure 3. The figure shows a list of Polish voivodeships by gross regional product (GRP) per capita, based on purchasing power standards (PPS) and shown in. It can be pointed out that many projects are implemented in regions with higher GRP. Moreover, over 28 projects were implemented in the Masovian region, and GRP for Warsaw is 47,900 EUR. Types of financing sources present on the Polish PPP market in finished and implemented contracts are at the investment stage: public funds, EU funds and private funds (capital and debt).

Europe infrastructure investments make up 30% of world infrastructure investments. According to Brzozowska (2018), the financial structure of local government projects is financial resources from banks at around 40–50% and around 10–30% of bonds in 2015–2017. At the same time, the author investigates the structure of financing infrastructure of local governments in Poland, where credits and loans are mainly used. The author notes extremely limited use of bonds and private capital financing.

Local investments are usually investments in infrastructure with a long lifecycle. The local government investment activity can drive local development (Standar & Kozera, 2019). Frequently, revenues cannot cover all infrastructure investment because local governments use financial market instruments, such as bank loans, bonds, and funds. Due to the temporary limitations of local budgets, borrowing can help reduce operational costs and continued financing; however, overspend on projects can lead to a burden in the future possibility to invest (Nose, 2017). Traditionally, local government units (LGUs) use the financial services of cooperative banks that constitute a fixed group of clients. The share of local government debt to the general government has increased in Poland since 2008. Since 2011, the share of local government debt to the general government has exceeded the average local debt of 28 European countries (Geißler, Hammerschmid & Raffer, 2019).

Related to the report to the Narodowy Bank Polski report in 2018 the municipal bond market

**Tab. 3.** Sources of local governments' proceeds from loans and bonds in 2009-2018 (in billion EUR)

| Municipalities | Financial instruments | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cities | Bonds | 0.8 | 0.6 | 0.7 | 0.3 | 0.5 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 |
| | Loans | 1.5 | 1.2 | 1.2 | 0.9 | 0.7 | 1.0 | 0.8 | 0.4 | 0.6 | 1.1 |
| Communes | Bonds | 0.3 | 0.4 | 0.3 | 0.2 | 0.4 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 |
| | Loans | 1.6 | 2.1 | 1.8 | 1.2 | 1.0 | 1.0 | 0.8 | 0.6 | 1.0 | 2.1 |

Source: Own elaboration based on Central Statistical Office (CSO), Financial economy of local government units for the year 2018.

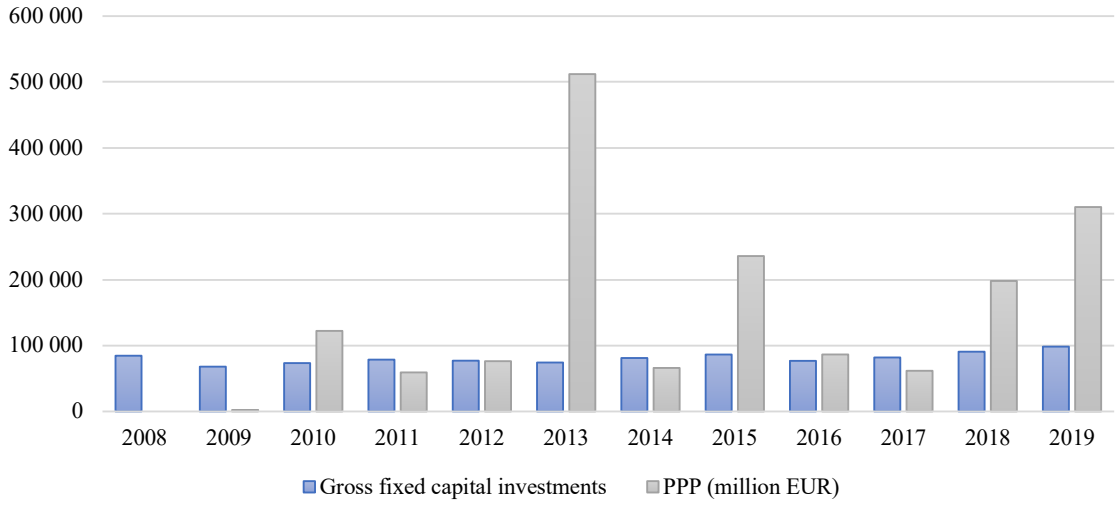


**Fig. 4.** Value of PPP project and Gross fixed capital investments in Poland 2008–2019 (million EUR). PPP, public-private partnership

demonstrated a dominant share of banks in the structure of municipal bond buyers. We can interpret this as an alternative to providing a loan to LGUs.

Quite evident is a decreasing interest in the municipal bond market in 2016–2018 in comparison with 2009–2013. The municipal bond market is concentrated mostly on large Polish cities, Poland ratings for long-term liabilities in foreign and local currencies are A-(Table 3). For three counties, such as Greater Poland, Lesser Poland, Masovia Fitch Ratings are also A- with a stable long-term perspective (Fitch Ratings 2020). An interesting compilation from the OECD presents local government capital structure in EU countries for 2017 (Vértesy, 2019). Regarding this data on loan vs bond share in the financing, local governments in the UK and Denmark are around 50%, and for Belgium 95% loans and 5% bonds.

As the central bank of the Republic of Poland, Narodowy Bank Polski prepares a report of the financial system in Poland. Related to the report, in Poland and other countries of Central and Eastern Europe, the banking sector plays a major role in the financial system. Polish and Slovak financial systems are considered one of the least banking systems-oriented in Central and Eastern Europe. Narodowy Bank Polski associates this with the growing role of non-bank financial institutions, such as pension funds, investment funds and insurance companies, leasing companies, factoring firms and lending companies. Generally, in countries in Central and Eastern Europe, the banking sector has a lower level of development compared to Europe and provides classic banking services (deposit-taking from and lending to non-financial clients). At the end of 2018, by the value of assets in Poland, 69.7% belongs to credit institutions, 10.8% investments funds, 7% insurance companies, 6.7% other financial sector institutions, and 5.8% to pension funds (NBP, 2018b). Between 2018 and 2019,

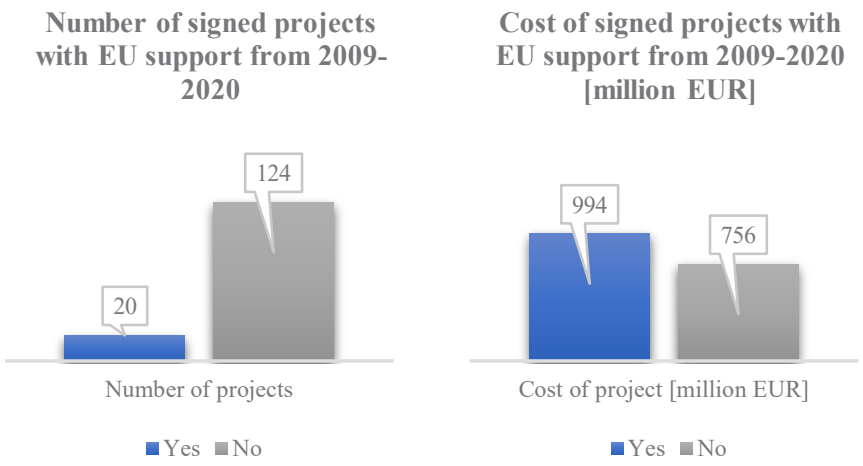


**Fig. 5.** Number and value of projects implemented with and without EU support. EU, European Union

PPPs gained importance in Poland as an alternative way to provide infrastructure (Figure 4).

Figure 5 shows that the cost of projects implemented with EU support, which equals around 994 million EUR, when without EU funds were implemented with 756 million EUR. Numerically it is presented as 20 projects with EU financial resources and 124 projects without. According to the European Commission Country Report for Poland 2019, EU funds in general for infrastructure 'directly financed close to a quarter of total public investments expenditure'.

Based on the analysis of the database implemented contracts, just four projects declared a particular percentage of bank participation in PPP projects. Around 87 projects we can find a description such as 'financial resources on private sector or own funds and/or credit' – the financing was solely or almost exclusively the task of the private partner. According to the Polish Agency for Enterprise Development (Bulletin, 2019), based on interviews conducted with those among private partners who were willing to share information about their involvement in the investment process in PPP projects, it appears that if they had to cooperate with banks, they needed to contribute a minimum of 15%. Only two projects were financed with around 75% of bank loans, and two projects had around 50% of bank loan participation. One case from the telecommunication sector, with 15% of the total project value, was obtained by issuing additional shares that were offered to private investors. Around 14 projects on around 174 million EUR were financed with the partial financial participation of the government.

Figure 6 shows the distribution of PPP projects in Poland according to the value and number of projects. Projects with EU support are more valuable projects, whereas other resources are presented with a larger number of projects and with a lower cost per project. Additionally, this tendency can correlate with a lower level of the highest investments in comparison with the average EU countries. At the same time, microenterprises have been well above the EU average. The average ratio of private investments to GDP amounted to 15%, well below 22% in the Czech Republic, 18% in Slovakia, and the EU average of 17% (European Commission, 2019).

According to the Polish Agency for Enterprise Development (Bulletin, 2019), PPP in Poland uses the project finance formula in projects with the largest scale of investment. They are financed primarily with the participation of the largest Polish banks (primarily BGK, PKO BP and Pekao SA) and foreign financial institutions. The Polish market is in the segment of small- and medium-scale enterprises, and either does not require funding from the private partner at all, or it is a small amount of uncomplicated nature that is provided by that partner under its traditional corporate finance.

The split of PPP projects with EU support depending on programmes is presented in Figure 7. From 2000 to 2020, Poland showed robust growth, which demonstrates the stability and attractiveness of Poland's economy. The total assets of the Polish banking sector demonstrate stable growth in the period from 2010 to 2018. The Polish banking sector regarding market share presents five banks: PKO BP,

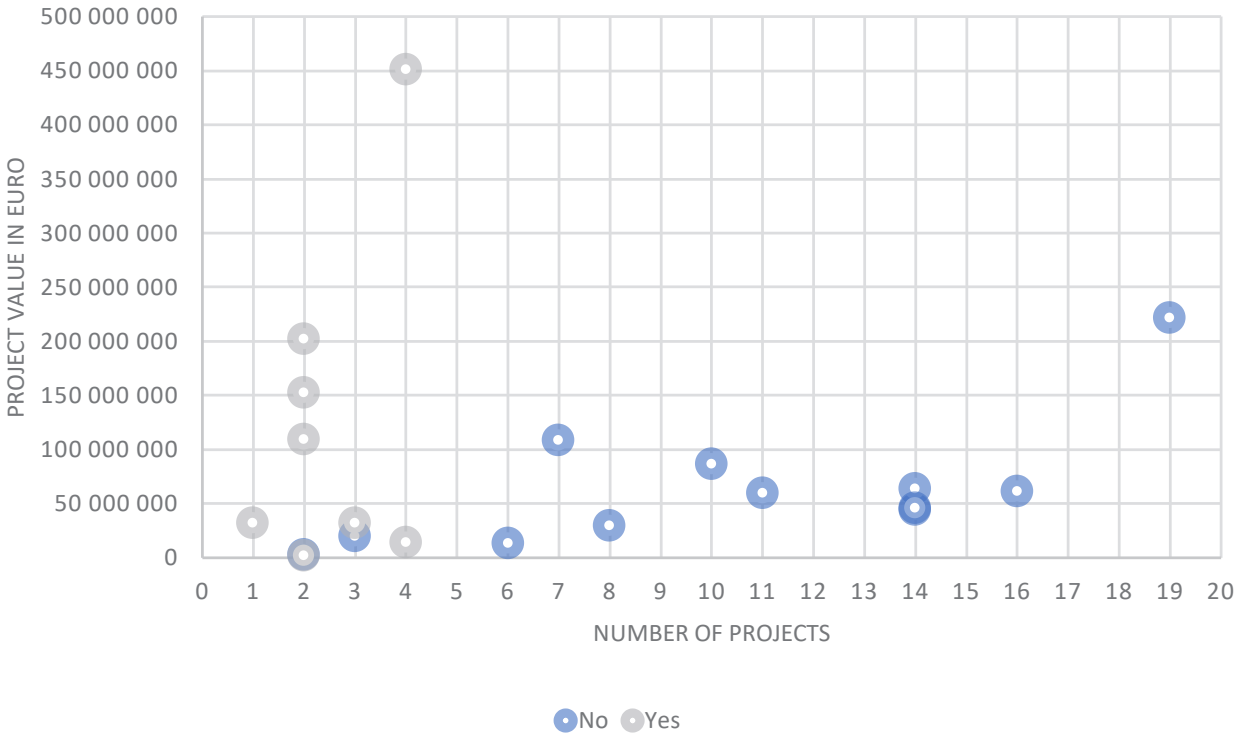


**Fig. 6.** Distribution of PPP projects with and without EU support in Poland 2009–2019. EU, European Union; PPP, public-private partnership

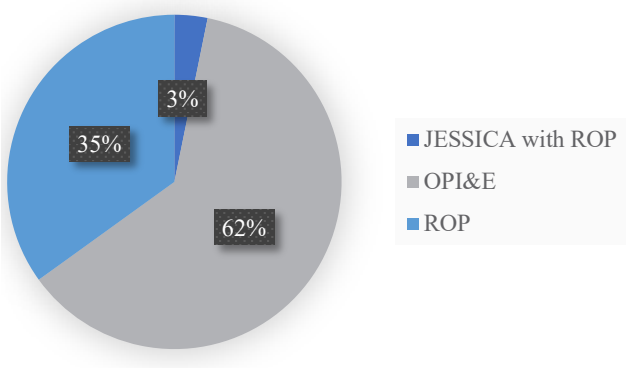


**Fig. 7**. Split of PPP projects with EU support in%. EU, European Union; PPP, public-private partnership

Santander, Pekao SA, mBank, and ING BSK (PKO Bank Polski, 2019).

According to KNF (Polish Financial Supervision Authority), at the end of April 2020, the banking sector included:

> 30 commercial banks;
>
> 535 cooperative banks;
>
> 33 branches of credit institutions.

The largest Polish banks, such as BGK, PKO BP, and Pekao SA, were among those that engaged in PPP. Other important banks that operate on the Polish market and display activity in the field of PPP include Banca Infrastrutture Innovazione e Sviluppo (BIIS), Espirito Santo, La Caixa, ING SA, NORD/LB: Norddeutsche Landesbank - BLZ, DnB NORD, Crédit Agricole, Bank Gospodarstwa Krajowego, PKO BP, BZ WBK, Nordea, PEKAO SA, Societe Generale, WestLB Bank Polska (Polski Bank Przedsiębiorczości SA). The European Bank for Reconstruction and Development (EBRD) actively participates in PPP. In addition to EBRD, the most active are: PKO BP, Nordea, BGK, DnB NORD, Credit Agricole and Italian BIIS, Spanish La Caixa and Portuguese Espirito Santo (Hausner, 2013).

BGK is a managing holding fund in 15 regions of Poland. It provides financial support to small and medium-sized enterprises (including self-employment of the unemployed), urban development, projects in the field of energy efficiency and renewable energy in the form of loans, guarantees and capital investments in the framework of regional operational programmes. BGK has played a key role in financing infrastructure projects in Poland's national economy since 2012.

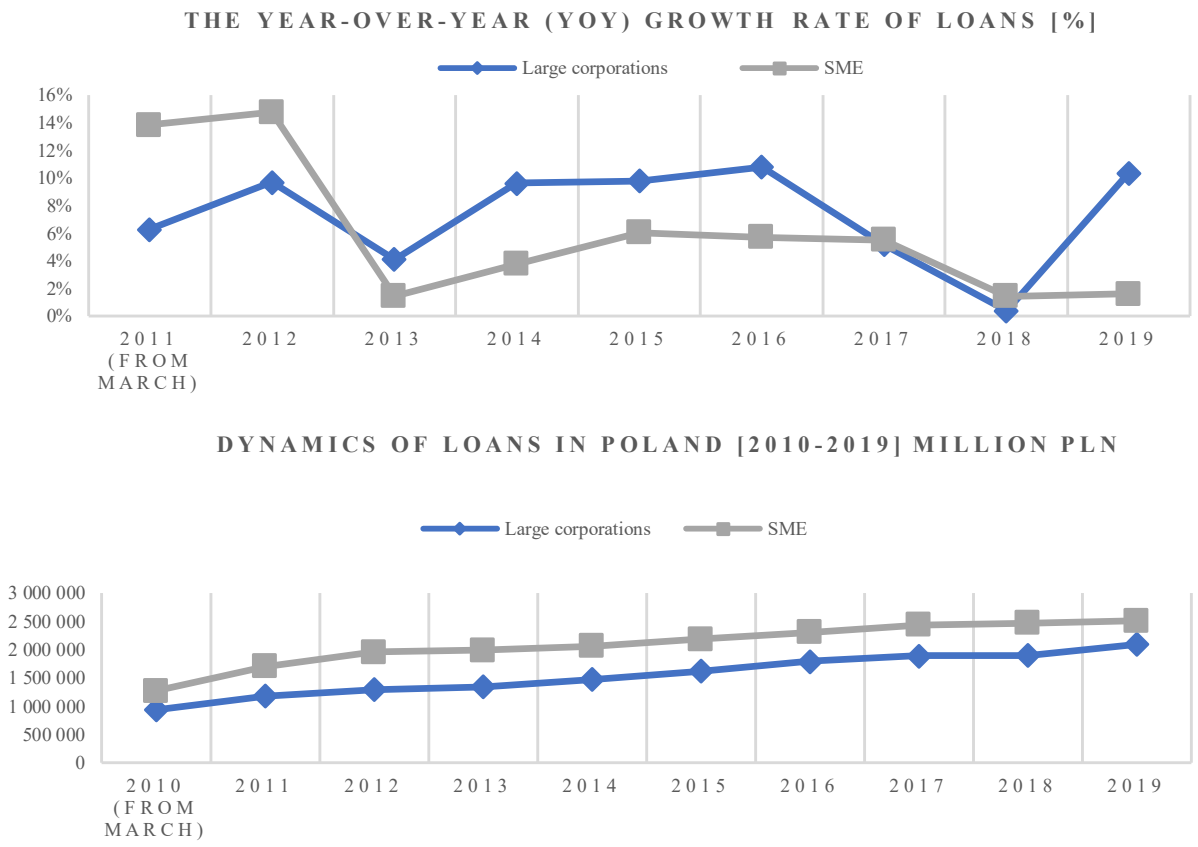


**Fig. 8.** Dynamics of loans in large corporations and SME in Poland 2010–2019

The World Bank claims that the small size of a PPP can build local capacity and expertise by involving small and medium-sized enterprises. The total market dynamics of loans in large corporations and small and medium-sized enterprises, according to NBP, are presented in Figure 8, which shows a stable value dynamic from March 2010–2019. However, the year-to-year compression rate demonstrates a fluctuation during the 2011–2019 period.

A brief overview of the Polish bond market size would be fruitful for the investigation. Polish bond Catalyst was launched on 30 September 2009. It was created by two institutions – the Warsaw Stock Exchange and its off-exchange market institution Bond magistrate Spot S. A. Debt instruments are traded on four independent trading platforms. Two of them are operated by the WSE and are dedicated to retail investors. Electronic order book turnover value in the bond market equals 2.7 billion PLN, with around 80,683 electronic order book trades in 2019, while 1.6 billion PLN with 70,134 electronic order book trades are corporate bonds (bonds issued by companies and financial institutions). The share of the corporate bond is around 61% of the total Polish bond market. The bond market is well developed; however, there is no evidence of PPP project bond issuances. According to Narodowy Bank Polski and, particularly, Report of Development of the financial system in Poland in 2018 long-term corporate debt securities is the main segment of the domestic long-term non-treasury debt market – their share in this market in 2018 was 49% (compared to 46% in 2017). The functioning of the corporate bond market had a significant impact on the termination of its obligations towards bondholders in 2018 Q2 by GetBack SA. This limited investor confidence in the market and reduced their demand for commercial papers (bonds) (NBP, 2018b). The Polish PPP literature considers bonds as one of the financial resources when PPP is implemented through project finance. In recent years, the project bond market has been rebuilt, although the scale is limited. A few projects issue bonds for PPP and for a narrow group of investors (Private placement) (Bulletin 2019).

In summary, Polish aspects of financial instruments in PPP projects, LGUs financing sources, and cross-country related information are presented in the article.

The main source of financing of PPP projects in Poland is bank loans and many projects have partial funding from various EU programmes. Many hybrid projects are financed at around 85% of the total project cost. In only one case the project issued 15% of shares to raise funds. The bond market is not currently suitable from the point of view of existing risks for financing PPP projects. Bank financing prevails in financing PPP projects. PPP projects are carried out with the participation and financial contribution of local authorities, mainly in the form of buildings and structures.

# 4 Conclusion

Sources of finance for PPP projects are not investigated enough in the world literature and in Poland. There is room for improvement for further related research, either academic or practical. Infrastructure investments have a significant share in GDP and PPP mechanisms and play an important role in providing infrastructure projects. Moreover, little attention is paid to the private sector, the main partner responsible for the provision of financial sources in PPP projects. In this regard, the literature review tries to distinguish financial resources by main factors influencing the choice of the source of finance that both practitioners and academics can use as the foundation for future PPP research studies. The scope of this paper is mainly related to empirical results, as in Rao (2018, 2020); however, it is also interesting from an academic point of view. The Polish case demonstrates that there is a lack of information about financial sources for PPP and it would be fruitful to extend the database of PPP projects with new factors that can simplify ex-post and ex-ante analysis. The main contribution of this study is to demonstrate PPP projects more from the private sector and distinguish sources of finance depending on different factors.

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